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A SOCIAL SCIENCES

AA	PHILOSOPHY AND RELIGION
AB	HISTORY
AC	ARCHAEOLOGY, ANTHROPOLOGY, ETHNOLOGY
AD	POLITICAL SCIENCES
AE	MANAGEMENT, ADMINISTRATION AND CLERICAL WORK
AF	DOCUMENTATION, LIBRARIANSHIP, WORK WITH INFORMATION
AG	LEGAL SCIENCES
AH	ECONOMICS
AI	LINGUISTICS
AJ	LITERATURE, MASS MEDIA, AUDIO-VISUAL ACTIVITIES
AK	SPORT AND LEISURE TIME ACTIVITIES
AL	ART, ARCHITECTURE, CULTURAL HERITAGE
AM	PEDAGOGY AND EDUCATION
AN	PSYCHOLOGY
AO	SOCIOLOGY, DEMOGRAPHY
AP	MUNICIPAL, REGIONAL AND TRANSPORTATION PLANNING
AQ	SAFETY AND HEALTH PROTECTION, SAFETY IN OPERATING MACHINERY

TENDENCIES OF HUNGARIAN CHILDREN'S LITERATURE IN 2020 AND OTTÓ KISS'S CHILDREN'S MONOLOGUE TITLED *A BÁTÝÁM ÖCCSE* [THE LITTLE BROTHER OF MY BIG BROTHER]

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Abstract: The present study discusses Hungarian children's literature of 2020 with a focus on its decisive works. We analyze works whose authors were nominated for or won the Author of the Children's Book of the Year prize in the under 12 years age category. Within the corpus of the investigated works two strong genre-based tendencies prevail: tale novel and children's monologue. We will be discussing how the position of lyric poetry gets re-positioned and becomes the marker of the mystical based on the analyzed works. From a poetics perspective, we will discuss the effects postmodern text-creation strategies have on children's literature, the lyric self of certain works / role-play of narrators, but we also touch upon the question of which works can be connected to active illustrations. Lastly, we shed light upon what solutions these works have for inspiring the reader to become co-resolvers and co-creators. We will analyze Mari Takács's *Bingaminga és a babkák* [Bingaminga and the Babkas], Erzsébet Kertész's *Éjszakai Kert* [Night Garden], Borbála Szabó's *A János vitéz-kód* [The John the Valiant Code], Edina Kertész's *Lajhár, a sztár* [Sloth, the Star], András Dániel's *Nincs itt semmi látnivaló* [Nothing Here to Be Seen] as well as the prize-winning *A bátyám öccse* [The Little Brother of My Big Brother] written by Ottó Kiss.

Keywords: Hungarian children's literature 2020, contemporary tale novel, children's monologue, narrator role-play, partner-creation, intermediality

1 Introduction

Our paper focuses on Hungarian children's literature of 2020. In order to at least partially suspend our subjective judgement, as a filter we use the under 12 years age category of the Author of the Children's Book of the Year prize (Hubby 2021a; 2021b). For this reason, we are going to analyze the awarded, Ottó Kiss's children's monologue titled *A bátyám öccse* [The Little Brother of My Big Brother], however, first we touch upon those works which had a good chance for being recognized, thus they determined Hungarian children's literature of 2020.

Based on the selected corpus, two decisive tendencies arise. One of them takes form around the edges of the keywords of prose, novel and fantasy. In numbers, this one is the more dominant, and the works of this category can be further organized based on whether their world is an unreferenced magic world (such is Mari Takács's *Bingaminga és a babkák* [Bingaminga and the Babkas] and Erzsébet Kertész's *Éjszakai Kert* [Night Garden]), or the entering of fantasy into the thread of reality appears as a challenge, as an astounding event in the novel (we see this in Borbála Szabó's *A János vitéz-kód* [The John the Valiant Code] and in Edina Kertész's *Lajhár, a sztár* [Sloth, the Star]). The other tendency can be triangulated by the key words of lyric poetry, children's monologue and the realist viewpoint. Besides András Dániel's graphic book titled *Nincs itt semmi látnivaló* [Nothing Here to Be Seen], this is where Ottó Kiss's work can be categorized as well.

The applied poetics, however, created such varied textual worlds that in order to describe them, one needs more than some orientational points. Their investigation calls for a much greater adventure...

2 Tale Novel Form Variations

¹ The goal of the paper is to unfold the substantive tendencies of contemporary Hungarian children's literature, and tangentially to formulate recommendations which align with the educational methodology of the given corpus. All this, and getting familiar with the heart of the problem are indispensable background materials for the demonstration of the connections between the Romani and Hungarian texts, as well as for their intercultural education, since the project also directs its attention to the challenges of the present.

The tale novels of fantasy traditionally constitute the essential tendency of children's literature. With her book titled *Bingaminga és a babkák* Mari Takács did not align her writing to the innovative contemporary endeavors, but rather to the early traditions of modern tale novels (Lovász 2007, 99). Since she only uses a negative character or a questionable deed with the omen of unambiguity, her work can be considered as a return to the ethical basic principles (Lovász 2015, 33).

Many a friendly race of the realm of Melantola are busy with the preparations of a ceremony. They are preparing mud faces to multiply the cheering, they are writing welcome speeches, and they are also composing a poem whose every single line becomes alive after it is recited. The world is interwoven with play and happiness and since the elements of reality and the surreal organically supplement each other, one can say that we are surrounded by an unreferenced tale world (Lovász 2007, 5; 13). Our three child heroes, the serious Valter with the junk-patterned t-shirt, the tiny Jinga representing childlike curiosity, and the brewmaster Biloba who communicates with word bubbles, they all become friends due to the ceremony. Together they wait for the greatest wizard of the world, Bingaminga to arrive in order to celebrate his three hundred and sixty-fifth birthday. However, a turmoil arises at the end of the celebration: the world is hit with earthquakes, Bingaminga feels (just like Benjamin Button) that suddenly he is getting younger, and what is even worse, the smiling, pink, rounded babkas become visible. "The babka is the pretty thought itself. The good idea. A nice heartbeat. This all together. [...] And if they don't reach their destinations in time, it can upset the balance. There will be more doubt, dark thought, [...] and] this way, in a visible manner, they can become easy targets of curiosity and greediness" (Takács 2020, 34–35). Thus the goal is given: seek out and repair the babka-maker machine and collect the babkas. This is why the three friends set off together with Bingaminga.

The characters of tale novels are literary archetypes (Mark – Pearson 2001) who either fit the roles of folk tales (Propp 1995, 37–78), or partially offset them. We have not one, but three explorer heroes. The wizard Bingaminga is the one who sends-off as well as a helper. As the enemy we can refer to the once friend but later traitor Morfió. Zenka and Zeneka, the machine-operators of the babka factory, who are the archetypes of the creator and the carer, are in the role of the gift giver, since they supply our heroes with various magical objects (Nagy 2020). The most exciting race of the world-building are definitely the babkas, who are the incarnations of kindness and ideas, and the peppuas, who communicate with word bubbles. Besides all this, the tale novel connects with scores of cross-references to Tolkien's *The Lord of the Rings* universe (Gandalf and Bingaminga, the wayfarer's path, the Melantolian minyon and the lembas, Morfió's name and the darkening sky on the basis of the language of Mordor, etc.), due to which it can rightly be considered the hypertext of the fore-work (Genette 1997, 5).

Mari Takács's creation can be classified as a didactic (Petres Csizmadia 2015, 154) and real (Bárdos 2013, 73) tale novel as it is confirmed by many places of the text: it considers teaching its task. An excellent example of this is when our heroes are learning the craft of transforming matter into various states. The work discusses these in detail, and it also verifies them visually. Another example for teaching is the part detailing communication with bubbles, which actually uses linguistic terminology. In a self-reflexive way, emphasizing knowledge multiple times through the journey refers to the didactic nature of the work as well, since it turns out that the real function of wayfaring is the learning along the way.

Most of the text has a narrative nature, there are no unexpected solutions in the plot, the most important recognitions are the statements of the narrator. The style of the narration is permeated

by the tones of beauty and kindness. It is slightly “adulty”, it is not afraid of superlatives and sometimes it is circumstantial. Dialogues are rather decorative elements and they do not really contribute to the reader’s ability to distinguish the characters, and the characters themselves can even be called paper-characters. The simplifying solution of the work is provided by the sudden idea of one of the characters, which resolves the herding of the babkas home without the characters changing positions.

From a poetic perspective the most exciting solution of the novel is the way wizardry works in it, since beside faith and trust (Nagy 2020) it also stands on linguistic and communal foundations. Almost all spells are light and brief nursery rhymes and children’s poems. Most of them rhyme (line, twin, half and recurring rhymes) and they use beat tone verse form, the rest applies nonsense verse form (Ortutay 1979, 2000). The effect of the communal magic poems is even more pronounced and the content of the texts becomes alive. Such is the poem composed for welcoming Bingaminga, too, which is an exciting example also, because even though it was not created by a wizard, due to its communal reciting it still comes true. This way not only the mage, but everyone else can be treated as a wizard. The phenomenon can also be read as self-reflection, since it puts the world-creating and imaginative function of language into perspective, because language does not distinguish between reality and fiction. The “pardon” term (and chapter title) is of key importance as well, which not only reverses any kind of a spell, but due to its meaning it also emphasizes the significance of apology. The simple forms which were intentionally aligned for the child receiver motivate the reader for co-creation, just like the fact that Bingaminga created some of his spells, the nonsense ones, by himself. “*This peculiar language wasn’t known by anyone else other than him, since it was his own childhood invention*” (Takács 2020, 44). By learning Bingaminga’s spells with the three heroes we learn how to create new ones on our own.

While in the case of *Bingaminga és a babkák* we can talk about the poem, the magic of creative language, Erzsi Kertész’s tale novel titled *Éjszakai Kert* is interested in the demolition of the expectations held against the text, the establishment of a private mythology, and the presentation of the latent, interconnective web determining the world order.

When at the beginning of the work Senora Cupapanas (“Csupapanasz” [‘csupa’ – Only; ‘panasz’ – complain]) walks through the Tisztasor street to ask the two best detectives of the city, Miss Spontán Teóriát [Spontaneous Theory] and Mr. Korrekt Tódor [Correct Theodor] to expose the perpetrators of a robbery, two things seem obvious. On the one hand, that the (telling, meaningful) names get a key role in the work, and on the other hand, that we can expect a children’s crime story. However, the work regularly goes against the genre expectations of crime stories. In the beginning it does so with the fact that instead of one, it operates with two master detectives who are each other’s rivals. Later by informing the reader that, quite absurdly, it was the ornamental pound that was stolen from the Senora. And lastly, by the fact that in the Night Garden the reader is introduced not so much to the process of the investigation, but rather to an entirely new world.

Tódor and Teória are opposites of each other in almost everything. Teória has prolific greenery on her balcony, while on Tódor’s only the chrome glitters. Teória is driven by intuition and childlike curiosity, while Tódor uses the “adulty” iron logic (Kaiser 2021), which manifests on the linguistic level as well. The language use of the girl is sparkly and open, the man’s is formal and reserved. Besides their passion for their work and their reluctance towards the Night Garden there seems to be nothing they have in common which connects them.

However, the tracks lead them there and in the gates of the Garden another cardinal actor awaits and then welcomes them. He is called Noxnoktisz, who seems to be a hybrid of a scarecrow, a mage and a vagabond. The man calls himself the

garden master, becomes their travel guide and at the same time turns into the central narrator and storyteller of the following parts. He becomes the root, which is also signaled by the fact that after stepping into the garden, his lyric and visually rich speech style becomes dominant in the text. What is more, even the style of the narrator seems to align to the garden master’s, and in many places of the text one is unable to decide which of them is talking. “*You know, [...] time in this strange Garden does not seem to hurry anywhere. It is comfortably ambling along, sometimes it sits down on a mossy rock, if walking with leaded legs becomes difficult. Sometimes even the spiders stop threading their webs, the birds stop chirping, and the leaves stop falling and float midair*” (Kertész Erzsi 2020, 36–38). Noxnoktisz’s lyric language is only suspended by the dialogue he has with the detectives, the relaxed style of the girl and the serious one of the man. These three styles are, at the same time, the poetic code of the text as well. The garden master is surrounded by the transcendent through his world-guiding role and wisdom throughout the text (Pompör 2012). This is also amplified by the Latin aspect of his name, which by the “nox noctis” we could translate as *night of the nights*. The latter, however, can also mean *daytime*: light during or after the night (Pataki 2021). If Noxnoktisz can be seen as the godlike occurrence, then his garden can be identified with Paradise, which is something that is referred to on multiple places in the closure part of the text.

The mystical and sacral aspect of the Garden is signaled by the modification of the illustrations as well, as soon as the detectives step through its gates. The previously vivid images are taken over by monochrome figures, colors are substituted by iterative shapes and patterns (Papp 2021). All this can be evaluated as the sign of a sphere-shift, which is analogous to the text becoming more lyrical (Pataki 2021).

By Noxnoktisz’s tale string the private mythology and the myriad of symbols expands gradually (Pataki 2021). Reality is substituted by fantasy and action by stills. We get to know special groups of people, characters and a multitude of fates. We are introduced to Those Singing to the Buds, who bring the spring and freedom, as well as Those Comforting the Crows, who soothe the messengers of winter, since they know the names of all crows. We are familiarized with the Cat with the Frozen Look, who sees everything in the garden, even the reader, since during the night its eyes glitter glossily on the cover, which is the concept of the latter, and even the introduction of the cat evokes the Mona Lisa (Boldog 2021, Gajdó 2021). The animal is the key figure of many intertextual connections whose web leads us as far as Chuangü-tz butterfly: “*Its eyes radiate such strength that I wouldn’t even be surprised to find out that it’s only imagining, dreaming the whole Garden*” (Kertész Erzsi 2020, 44–46). Based on the latter, the cat could be identified as the narrator. And of course, there is The Girl Whose Lies Make the Clouds Fall Off the Sky, literally, or The One, Who Stands on His Head, so as to see the world differently. It turns out that many of them got to the Garden from the outside world and by being transformed there, they found their true life purpose (Kertész Erzsi 2020, 72; 83). Erzsi Kertész’s name giving strategy evokes both Oscar Wilde’s and István Csukás’s solutions. According to these, names have a predestinative effect. Our fate and our role are coded into our name and we need a big effort to confront it.

However, there are not many occasions for actual investigation. Mainly there is proliferating world-building happening throughout the whole time. It seems that the biggest discovery is the perception of the interdependence of it all. To provide an answer for such “accidents”, the text uses the transcendent. But it does so not by its deus ex machina-like, direct operation, but by the subtle, light effect of the Garden (Gaia, the Earth, the World) and of the gardener (the forces working in him), which often promotes the goal by building seemingly circumstantial background connections. From the point of view of the endgame, in case of Tódor and Teória, the work does this in order for them to realize: what they were looking for was right in front of their eyes from the beginning. The help of the

transcendent does not mean, however, that in order to achieve change, we do not need the individual will of the elements making up the universe (the characters, the readers). Primarily this is exactly what is needed to provide help to achieve something in the first place. The Girl Whose Lies Make the Clouds Fall Off the Sky can only leave her predestinative name behind by actually wanting to do so and doing something about it as well.

Even though the stories of the work have a sorrowful atmosphere, they do not make us sad, since in the heart of every tale the sparkle of hope is retained. “[The] *ghostliness becomes friendly*” (Kaiser 2021), and the child reader will not fear, but admire the night (Papp 2021). This is what the humor of the text contributes to as well, which manifests itself in the chapter and subsection titles, in wordplays, in images and in the archaic solutions mixed with contemporary anglicisms. Besides this, the tales organize themselves into a complex, scale-independent network (Barabási 2022), since the element emerging in one of them blooms into an independent story in the other one.

Certain characters and their challenges are the metaphoric mappings of types of people and life’s difficulties, which make the text possible to relate to such classics as *The Little Prince*. Thus, it can be classified not only as mythological, but as philosophical (Petres Csizmadia 2015, 155), too, and from a formal point of view, it falls into the category of the tale novel revolving around a single plot thread (Bárdos 2013, 73).

However, miracles are not the natural elements of all worlds within the works of children’s literature. Sometimes they only linger in the background, or they are present as a consequence of some elements. And some other times it is our reality which breaks into the fantasy universe, such as we will see in the following.

3 On the Border of Worlds

Sándor Petőfi’s *John the Valiant* is an unevadable piece of the meaning-canon of Hungarian literature (H. Nagy 2016, 78). It is a naïve hero story and a poetic tale, a key work of romantic idealism and folk literature. Besides this, it is an eternal compulsory reading which makes its era-alieness even more visible, since both in its form and worldview aspects there is a huge gap between it and the literary-social tendencies of our present (Mészáros 2021). This is verified by Borbála Szabó’s math genius team in her novel titled *A János vitéz-kód*. The quartet can solve any exact problem, but literature, where “*the meaning of words is not a constant*” (Szabó 2020, 18) is alien to them. They rather create a reading diary generator computer program than to go through a few lines of poetry. Their aversion prevails until Berti, their self-appointed team captain transcodes the narrative poem into a sequence of numbers. His boredom-defying game opens a dimensional gate between reality and fiction, and he then falls over into the universe of the Petőfi work, by which he disrupts the flow of both worlds. One world due to his absence and the other due to the ballast. This is an adventure tale novel (Petres Csizmadia 2015, 154) which applies the patterns of portal fantasy (Mendlesohn 2008, 1), and thus “*its truly curious aspect is that the protagonist goes over into a world which was created by another text*” (Fenyő D. 2021, 95).

Szabó’s creation remains a novel with a flowing momentum and with bafflingly vivid and varied humor while still activating a myriad of postmodern text-organizational strategies. The work contains significant passages from Petőfi’s *John the Valiant*, but only in cases where one of the characters is reading the narrative poem. Berti’s arrival, however, changes *only* its plot, not its form. The beat tone verse, four beat halving twelve with the pair rhyme framework remains, but it is filled with new content. Some of the line pairs and verses of the old text are replaced by new ones. The original, however, does not get rewritten entirely: its text fragments wander around into new sections, sometimes they even get built into entirely different chapters (Fenyő D. 2021, 96). For example, Johnny’s monologue of the original, which he delivers after defeating the outlaws, becomes a

dialogue, since his newly found partner, Berti, answers every sentence of Johnny, thus disrupting their purity: “*»Maybe there are bloodstains stuck on every piece / And I should be happy and rich with such treasure?« / »No problem, we wash it off! Money does not stink. / (This is my father’s favorite sentence, too.)«*” (Szabó 2020, 145). We experience the continuous alternation, competition and blending of new and old. Via Berti the contemporary student slang, the soft vulgarisms, the technical innovations (he takes his smartphone with him) as well as the snappy style, appear as the counterpoints of the original text, gradually suggesting how alien they are to each other. The latter is also an important source of humor: the appearance of contemporary language and worldview parodizes the elevated nature and ideas of the original (László 2020). Thus the poetic pole of Borbála Szabó’s work is a hypertext, rewriting, true palimpsest – since considering its chronology, it is written over the original –, and is also a palinode, that is, a poetical recantation. Berti’s presence at first only supplements the original happenings, however, the boy’s pragmatism gradually defeats Johnny Corn’s idealism. The valiant does not return to his abandoned sweetheart in order to let the fabulous continuation of the original text unfold. Instead, he marries the rescued French princess and becomes a despotic ruler under the name of Jean le Maïs with the support of his scrounging treasurer, Berti. The masterly preserved form and continued writing by Borbála Szabó marks the narrative’s dimensional shifts as well. The poetic sections inform us about the happenings of the fantastic world of John the Valiant, and the prosaic ones tell us about the realist novel world.

However, Berti’s disappearance and the transformation of *John the Valiant* has a retroactive effect on the boy’s world, too, and it upsets its social order, whether we look at the universities, politics, law enforcement, or the families of the math-genius friends. Szabó moves numerous characters and when she introduces them, she uses marked solutions of caricature (László 2020). The *A János vitéz-kód*, due to its satiric and social-critical analogies can rightly be considered a double-edged novel, since it is intended as much for adults as to their children. Nevertheless, in the light of Hungarian children’s literature, its most marked victory over taboos is the opening of political questions (Borbás 2020; Mészáros 2021) via potential analogies in the spirit of critical thinking and without a hardened ideological stance.

The stake of the work will not only be how the friends could help Berti get back to his own world, but also prevent it from turning gloomy. The reason why this could happen is that by John the valiant not performing his wonderful deeds, the bogies of the tale world infiltrate the novel’s reality, and via a grey “epidemic”, whose symptoms are indifference, oblivion and nightmares, they thrust the entire country into disillusionment. From this point of view, even though Petőfi’s ideas and values might be alien to our era, had they not been lingering in the background as romantic values, maybe our reality would be shaken as a consequence (Fenyő D. 2021, 95, 98–99). It is not accidental that at first the process of rewriting is characterized by the original text, but after recognizing the gap, the new text turns into the reconstruction of the old one.

Another of Szabó’s memorable solutions is the identifying of the narrator’s role with herself, that is, her approximation to the included author (Booth 1961, 157–159; Lapis-Lovas 2021, 90), as well as that in her case, we do not only have an omniscient, but an omnipotent narrator. Besides seeing into all characters’ everyday lives and secrets, she acknowledges that as a writer, she could give them the sourest of fates. Meanwhile she is also present as a character in the book. The work’s narrator, therefore, has a status that is beyond dimensions, and belongs to multiple world levels at the same time, which can be evaluated as another postmodern solution (Bedő J. 2020).

By the end of *A János vitéz-kód* our heroes realize not only that literature and mathematics are related – since rhyming is determined by exact mathematic rules which one should observe –, but also that both fields are full of puzzles. According to the

experiences of the work, there are not only gaps between words and numbers, art and logic, popular and classical literature, but they are also connected by bridges (Karafiáth 2020). The code in the title mimics not only *The Da Vinci Code* type of texts, but also invites the reader to a decoding adventure together with the characters: be it the math problems of the national mathematics competition, the solution of such literary codes as the acrostics and chronograms, or the identification of the rewriting patterns which fundamentally define the work. However, the latter truly works only if they read the old and the new side by side, the same way as the characters do it. “Yes, all news were about you, on the internet and in the TV, too! You abused the great work of Hungarians, but there were people who thought this was good” (Szabó 2020, 294) – said his friends to Berti when he returned. Their words are valid self-reflections for the entire *John the Valiant Code*, since a successful rewriting assures at least as much attention to the original text as big of a benefit it draws from the original’s reputation. It is none other than a mutually advantageous blood rejuvenation.

Nevertheless, often there is no need for an entire fantasy world to be able to analyze our own face in its reflection. Sometimes a single element of it is enough to do this. In Edina Kertész’s tale novel titled *Lajhár, a sztár* the experience of our own alienness is present in parallel with the most important dilemmas of popularity. Our protagonist, Lona, and her family, who are living among humble circumstances, are anthropomorphized sloths. Their favorite activities include napping and watching TV while sipping leaf-shake. Lona struggles with the everyday problems of ten-year-old girls. She is a little insolent with her parents, regularly makes resolutions which she is unable to keep (“never, never ever again”), but first and foremost she wishes to become slimmer, more popular, and she wants to become friends with the school’s girl-trio. This is why, by summoning all her courage, she says hi to them, sits next to them in the canteen, lets her nails get painted, and also this is why she makes a seemingly cool selfie. Yet, she achieves the opposite effect: not only sit they away from her, not only do they mock her with a series of comments, but they also create a fake profile for her under the name of Undipofi [disgusting jowl] where they could continue insulting her. Lona’s desire to please everyone brings her not only numerous forms of cyberbullying (Domonkos 2014; Huber 2015), but also that the community discovers her sloth nature. Thus, the latter becomes a metaphor for alienness and Lona would do everything, including denying her previous life and herself, too, to change this situation. However, since we do not have a predetermined exclusion, the work also lets us know, that anyone can become a sloth, should they be put into the center of attention. The most severe instance of ostracism is an Insta-comment in which Lola is sent the following message: “Go back to the jungle where you came from!” (Kertész Edina 2020, 74). However, the sloth-girl was raised in the same place as the other kids, and about her roots she is only aware of the fact that her parents immigrated from Costa Rica. Henceforth “slothness” becomes the signifier of ethnic and social otherness and exclusion. Finally, uncle Pedro pops into the lives of Lona and her family also from Costa Rica, who via his love for life and inexhaustive stories becomes the most important motivation for the characters to recognize: the notion of otherness can not only be substituted with alienness, but also with peculiarity. And the exaggerated desire to please people threatens with the danger of giving ourselves up (Papp 2020). From this perspective it is a positive ending note that, at the end of the volume, the previously mocked ribbon can be seen in Lona’s hair again.

The voice of the work’s omniscient narrator can be identified with that of an adult who knows what is right and what is wrong, and with her occasional phrases as if she was trying to adjust to parental expectations. Her language is characterized more by situational than linguistic humor. An example is the repeated “storming out” of the sloths, to which she reacts as follows: “(Well, maybe she was not actually storming. Rather trudging. And this made the whole thing even more awkward, because it is impossible to retain our dignity while slowly trudging along, just try it once!)” (Kertész Edina 2020, 34). Although the side characters’ telling names are creative (the angular character,

Square, is the math teacher, Anthony Suspicious is the detective), the characters’ type aligns towards the black and white poles. For example, the trio responsible for the ostracization of Lona goes through a full transformation after the principal, who normally is against punishment, scolds them. The most memorable character is definitely Dragée, who not only calls Lona’s attention to the fact that one does not have to and cannot always please everyone, but via her animal protection and donation collecting activities she assures the green dimension of the work, orienting towards the intensifying tendencies of children’s literature (Zólya 2020; 2021).

The artwork of the text actually tells the same story via the apparatus of another art form. The visual dimension is sometimes parallel with the text, but some other times it looks ahead or mediates extra contents. When Lona locks herself in the girls’ toilet, the body of the text is surrounded by the scribbles written and drawn on the booth’s walls, and on another occasion, we see the smaller version of the poster made by the characters. All this repeatedly connects the novel to children’s culture (Petres Csizmadia 2015, 11), but it is also a self-reflection on the Instagram platform. There we also let others know about ourselves through images, and with some keywords, that is, hashtags we capture the essence of the visual material. Kertész’s novel in a way also uses hashtags, since the body of the text emphasizes the most important pieces of information typographically, and some font types even align with the key characters. Thus, the text allows multiple orientations and searches for the recipient, while it blends the medial peculiarities of novels and social platforms together. These solutions of the *Lajhár, a sztár* reflect on certain steps of the teaching of reading strategies (Almasi 2003; Steklács 2013, 52–60), such as getting the gist and the possibilities for connecting text and imagery. Besides this, at certain points the text even counts with the creative work of the recipient: it expects predictions from the reader regarding the development of the plot (ticking the box), on another occasion it lists the questions of a self-awareness test, where we can provide our own answers on the dotted lines after seeing the answers of the characters, and also there is a place in the book where it gives the reader a coloring task. In any case, we run out of the interactive tasks at about one third of the volume, which makes the initial strategy feel a bit laid aside.

Instagram provides an important dimension for the novel: its icon appears immediately as an accessory of the title, and the lilac images and letters of the volume also align with its color code. Although the narrator repeatedly refers to the meaninglessness of the social platform, what is more, at the end of the book she even suggests quitting it – and by her recurring criticism of techno-culture she exposes the generational alienness of the adult narration –, she does not provide a verdict about it after all. “The only thing that made her moody sometimes was when she only received one hundred and eighty-three likes, but then after half an hour she posted a better photo which received one hundred and ninety-eight likes, and then everything was all right again” (Kertész Edina 2020, 103). Therefore, the number of responses received for the shared content functions as a status symbol among the teenager community. Although the platform provides a space for bullying and ostracism, the work signals that as an Insta-star and influencer one can move a mass of people in the interest of a good cause as well. It is up to us how we utilize the platform. Thus, the work is, simultaneously a praise for and a criticism of Instagram, social platforms and popularity, and due to its many teachings, it can be classified among the didactic (Petres Csizmadia 2015, 154) tale novels threaded around a single plot string (Bárdos 2013, 73).

4 It Unfolds Inside Us

The other significant stroking direction of 2020’s children’s literature is provided by contemporary children’s monologue, which draws attention to itself either with its psychological depth or its intermedial extendedness.

András Dániel's unconventional picture book titled *Nincs itt semmi látnivaló!* [Nothing Here to Be Seen] belongs to those works whose plot can be summarized in a single sentence. It is a monologue of a child who wishes to sleep but his thoughts do not allow it. The setting medium of the work is a multidimensional confine. From a thematic point of view, it stands in-between dream and wakefulness, referentially it is between reality and imagination, medially it is in-between literature and art, and from a depth point of view, it stands on the border between children's speech and ontological-epistemological dissertation. Its framework is framelessness: from the light switch turning the sun off, it goes to the infinite.

The work is an intermedial creation, in which the visual dimension is not merely the illustration of prose, but while aligning to the best solutions of contemporary picture books (Lovász 2015, 13–16), they supplement each other and together they build the world (Várnai 2017, 392). This game is particularly exciting in the sense that the work embarks upon not only the visualization and textualization of objects and events, but also abstract notions, thoughts and sensations as well (Boldog 2020). The volume, while adjusting to the medium of insomnia, "is unconventional in the sense of both the color scheme and style that can be »expected« from children's books" (Lapis 2020, 13). The vivid colors belong to the external effects (light stripe under the door, the lights of cars passing in front of the window) refracting the dark setting of the room, or to the thoughts and memories related to the objects and scenery of the daylight world. On the contrary, the shaded colors lead to imaginary, fantastic and transcendent provinces, they visualize the elements of these domains. Thus, the color code places the elements of the associative spiral into various levels.

The cut out black hole on the volume's hard cover is shaped like a darkened human eye. The title gets a place in this, referring to the fact that the work is similarly searching in the dark. And by having the eye's nerve fiber continue on the first pages, it also indicates that what is *inside*, is behind the closed eyes, that is, it takes place inside consciousness.

If Carroll's *Alice*-duology was organized by dream-logic, in case of Dániel's work we can talk about associative logic. The center, creator and focal point of the evolving world is the narrator, who remains name and genderless (Nagy 2020). The only thing that is certain is that it is a child, since the (generally opposing) opinions of the parents and adults remains a referential point for it throughout the whole book. "Nothing here to be seen! Stop looking around, sweetheart, just sleep! – as mother used to say [...] But that is exactly the problem, that there is always something to be seen inside my head." (Dániel 2020). The sensitivity of the narrator towards art, mainly towards visual culture, appears in many places of the text (Pataky 2021), which can dynamize the work's intermedial solutions. With his thoughts, the narrator is always striving to fill in the gap which it is surrounded by. From a calm setting, the narrator's associations lead it to popular film culture, the game of the shadows direct it to the shadow theater and the anthropomorphization of the surrounding objects, and darkness guides it towards imitations of flamboyant graphic art. Although it is not able to recollect the artists' names, only how those sounded like – "enni van hol" (Andy Warhol) and "olyan mijd" (Jean Miró) –, its thoughts and the volume's visual material evokes their styles. Other times it is talking about the coloring of furniture contours, to which the picture responds by leaving vivid and colorful paintbrush marks on them. The animation of the flying childish imagination in András Dániel's picture book is enabled by art, which by certain classmates of the narrator/associator is considered "stupidity", according to it there is also "Stupidity that is good!" (Dániel 2020). It is a nice reinterpretation of l'art pour l'art.

The work's textual pole is a children's monologue, which is written from a frog perspective through the entire work. It is playful, in some places inaccurate ("tényleg-e [really-so], bigyós [dingus], izéke [thingy]" etc.) and uses taboo-free children's language (variations of defecation). Poetically, the text is short and simple, however, it is built up of sentences summoning

significant depths. From the simplest moments of life, through the discussion of sensations and materials learnt in school, to theological truths, it investigates the world while remaining mindful and open. The world-building aspect, both from the conceptual and visual point of view, is based on the associative and spiral-like connection web. The gradually scattered elements gain more and more weight by regularly recurring in different contexts. As a matter of fact, this is how the clicking of the switch, the counting of the black cows, the flying imagination as film screening, and the wizard capable of vivifying and removing its medium become key motives. In a certain sense, the narrator itself is a wizard. It is a mage of imagination, and its associations are the results of the creative work of its brain. As it confesses it with respect to the shadows of the branches projected on the curtains: "There are all kinds of creatures living in this forest. I know because once I had imagined them. They are there ever since" (Dániel 2020). When it discusses the relationship between the language of the Frankas and the Kripps, its words clearly reflect the topical school curriculum. However, going forward in the text, it often refutes its previous statements and imagined creatures, sometimes precisely with the argument that they are imaginations. All this makes the world-building increasingly open, thus it operates with the reality of multiple possible readings, truths, and opinions.

Yet, this is how the world remains unified. The lack of light blurs out the contours and makes the differences disappear, since "in darkness, all cows are black" (Dániel 2020). Similarly to how the tombstones bearing the symbols of different faiths can exist peacefully next to each other in the cemetery, father's atheism, mother's Buddhist and granny's Christian faith fit seamlessly into the thread of the universe (Pataky 2021). The narrator tries to raise bridges one after the other between its classmates and the imagination of a beetle, too. And there is the bridge in the endgame, bending over Chuang Tzū's butterfly and demolishing borders between words, which is built on the line of: "It occurs to me that", and it ends with two black pages. Thus, openness endures here as well. The narrative steps into the dreams and provides space for creative continuation at the same time. An excellent solution!

However, beside imagination, the relationship between siblings also hides sensitive depths, whose unfolding is also well enabled by children's monologue.

The latter text group has its foundations standing on reality, thus signaling that in these poems the child, instead of the fabled world, is faced with reality with its dark side as well (Petres Csizmadia 2015, 70–71). Ottó Kiss exchanges the Swedish standard, the sentence-oriented, variable unit-based solutions of children's monologue with coherent background stories which operate with references pointing both forward and backward. These accounts are developed along the life-story fragments of the characters living inside the poems (Gombos, 2013, 57). In his volumes titled *A Csillagszedő Mária* [Mario the Star-Picker], *az Emese almája* [Emese's Apple] and *A nagypapa távcsöve* [Grandfather's Binoculars] (Kiss 2002, 2006, 2011) he focuses on the relationship between children and parents, grandparents as well as children and children. These philosophical trains of thought lead to acceptance, to the path leading to each other (Petres Csizmadia 2015, 74), and instead of the "I" and "they" stories, it aims at finding the "our" story (Pompor 2010).

Kiss's volume titled *A bátyám öccse* [The Little Brother of My Big Brother] further weaves the forming relation-web of the previous creations, this time putting the relationship of two brothers into the foreground. The central moving element of the work is the *versus*, the always timely conflict of the smaller child and the bigger one. This rivalry can be activated by anything, and is playfully autoletic and self-inducing, but at the same time, it always has the element of love lurking in it in parallel (Pagony 2020). In the volume, all this is accompanied by rich humor and situational comedy evoking the style of Éva Janikovszky (Uzseka 2021, Nagy 2022).

The work is written from a singular horizon, in our case, it is the inferior position of the smaller sibling, while the voice of the big brother also appears in form of reported speech. The latter is an exciting self-reflection, since it is typical for children's monologue to exclude the voice of the adult, thus they appear as incomplete discourses. However, the big brother is not an adult, yet, but stands somewhere in between the little brother and the adults. Mediating his answers and utterances via reported speech strengthens this intermediate status poetically as well. The style of the text, which is mimicking the voice of a child authentically, has the nature of live language, it is compressive, puritan and sometimes childishly bumpy. Slang expressions and soft vulgarisms appear in it as well.

There is a certain ping-pong going on in the work between the two brothers. A perpetual word-dual, whose only purpose is to annoy each other. "*Meanwhile Ottó Kiss does not moralize, but he illuminates the dynamic between the brothers through the glasses of a psychologist*" (P. Szabó 2021). The older one talks to his sibling from the higher position of the big brother, using a slightly disparaging voice: "*he can't go anywhere from me, / he has to be sacked out at home every afternoon, / but no problem, I will be surely sorry for this, / he will teach me a lesson*" (Kiss 2020, 24). He is the offensive one. Thus, the little brother speaks from a perpetual defense, however, he does so from a kind of *clever-clever little sibling* position. For example, when the big brother puts the "*NO ENTRANCE! INCLUDING SIBLINGS!*" board on his door, the little brother naturally "*draws his attention to the contradiction: / if no entrance applies, / how did he get in?*" (Kiss 2020, 8). Besides this, he wants to prove himself, especially that, even though he might be smaller and younger, he is not less clever than his big brother. And generally, he is successful in doing so.

The hierarchical basic stance of the two is coded into the title as well. Looking at it from the point of view of the voice speaking in the volume, the title simply means "I". Although, since the whole text is the train of thought of the little brother, we can also claim that it is he, who positions himself this way. Thus, he acknowledges the superiority of the big brother via the title, too. Meanwhile, he also longs for recognition from his brother, since the title indicates the alignment to the older one as well. The relationship of the two brothers is so significant that the self-determination of the lyric I is only possible in case of the big brother (Boldog 2021). The lack of names is also important. Only the status of the siblings is known, and it is determined only by the relation between the two. Both would lose their essence without the other. A little brother can only be that due to the big brother, the same way as the big brother owns his role thanks to his little brother. Without names and this status the two voices of the work would disappear.

A bátyám öccse can be divided into five thematic units (poems). The order of the first four is interchangeable, but not its verses. The sections are built up along the train of thought of the lyric I and the epic thread. The position of the last poem is more restricted, since in it the splinters and ideas of the previous ones merge and crystallize. The titles of the poems – (*LEGÓ* [LEGO]), (*KÓLA* [COLA]), (*KESZTYŰ* [GLOVES]), (*VONAT* [TRAIN]) and (*TÁRSAS* [BOARD GAME]) – function as historic orientational points. However, the parenthesis also indicates that it is actually something very different that is decisive, namely, the development of the relationship. András (b) Baranyai, who "*drew facial expressions with only a few lines, and the body illustrations in an angular way, gave the illustrations a Lego style*" (Boldog 2021), reflected on the Lego motives spanning across and connecting (building?) the texts.

The overture of (*LEGO*) determines the mood of the entire volume. "*My big brother has a little brother, / who unfortunately is actually me. // This alone is enough trouble, / but it is an even bigger one, / that this will always remain like this*" (Kiss 2020, 5). The superior pranking of the fifteen years old big brother manifests itself in such cosmological artifices, like: it does not matter that the ten years old little brother is growing, the universe is continually expanding, thus in reality he is always

getting smaller. In the meantime, the proving desire of the little brother could be verified by the numerous recurring of a variation of the "*as if I were completely stupid*" formula. And he manages to prove this successfully. For example, when he does not tell on his big brother about him bringing his girlfriend in: "*My Lego collection is getting bigger. // But what is even more important than this: / his collection is / decreasing!*" (Kiss 2020, 12). In this section the siblings' comradery is coupled with the "business is business" approach, while the growth competition is also equalized, since the increase in the number of Lego pieces becomes the counterbalance of being little. From a formal perspective, this is also reflected in the decrease of the syllables in the quoted, closing lines of the poem. The moral of (*KESZTYŰ*) also has a backlash on the big brother, since only his room is left out from the cleaning he forced onto his little brother, thus he is the one who gets reprimanded by the parents. And the prank of (*VONAT*) also backfires when he buys a one-way train ticket to a faraway place for his little brother on his name day in order to get rid of him for a while, but the ticket gets redeemed in time and the money is used to buy the desired toy train. In any case, the annoyances towards the big brother are ingenious, and in their own way, they have a teaching power, they develop intelligence and motivate for preparedness, which might come in useful "later in life". After all, ingenious offense can only be fought back by ingenious defense.

It is also true, however, that the David-like dexterity is often victorious over the big brother Goliath, in other sections, via certain remarks, the little brother manages to unveil his own childishness and lack of knowledge. The moment when one of the lenses falls out from his glasses at the overture of (*KÓLA*), and he cannot manage to put it back, is a metaphorical mapping of exactly this. His blindness is mostly visible in his relation to love and lust. Ottó Kiss's work uses hidden references to suggest this, since behind the closed doors the big brother and his girlfriend are "*moaning and laughing*" (Kiss 2020, 8), but the most amusing part is when the little brother insists that: "*I wasn't born yesterday, / I know what is going on, / I know that they are making love, / what is more, they might even be kissing*" (Kiss 2020, 52). However, making love in his vocabulary does not refer to sexuality, but the cuddling time the lovers spend together. This is unveiled by the escalation, according to which, for the lyric I, the kiss represents a higher level than lovemaking. This can be used to confirm that the little brother decodes and knows many things correctly, but not everything.

The overture of the last poem of the volume titled (*TÁRSAS*) is a (child) philosophical rumination, which is about the meaninglessness, private aspect and importance of the found properties. "*Because they are valuable for me, indeed, / and their value lies in the time spent together*" (Kiss 2020, 42). In connection to the junk laying around on his own and his big brother's shelves, the lyric I notes that their value lies in the fact that there is a memory of an event connected to each of them. The fifth poem, via its structuring and in a self-reflective way, relates to the previous four in the same way, since it annexes them inside itself. The gloves, the train, the Legos, they all return and their value increases via the memories connected to them. Some of the objects gain their own importance later. For example, the cone-shaped hearing apparatus, since the little brother uses this device to overhear the big brother's discussion with his girlfriend, when his sibling "*whispered, / that these days he finds talking to me quite enjoyable, / that these days he can more often play / checkers and board games with me*" (Kiss 2020, 53). The latter is the biggest gift of the little brother, since these sentences enable him to grow up to the desired role of a sibling (which his big brother welcomes, too). And the fact that his big brother might have let him win in the board game suddenly gets revaluated from a lie to the sign of attention. By this, order is restored. The indignant voice and the annoying of each other opens up, and their hidden contents, one another's importance, takes over. At the end of the work, as a sort of framed solution, the disillusioning opening lines of the book get overwritten, and while reflecting on their own development, they get re-aligned, that is, "straightened out". One could say that they turn into clean lines. Because after all, "*It is a good feeling*

to have a big brother like this. // And it is also a good thing, that I'm his little brother. // But the best thing is, that this will remain like this forever" (Kiss 2020, 55).

5 Summary

If we only consider the experiences of the last two decades, tale novel has undoubtedly been the key genre of Hungarian children's literature. Through tale novels, and other tale books, the dominance of prose is significant in this age group as well, even if not as much as in case of young adult literature. Nevertheless, the year 2020 was also exciting due to how lyric poetry got re-positioned. Ottó Kiss's and András Dániel's works suggest that its position got strengthened. It is important to add, however, that both works are children's monologues, which is the genre that stands the closest to lyric poetry. The classical verse forms, rhyme and rhythm, appear in new roles. In case of Takács, they become tools of wizardry, Szabó and Erzszi Kertész use them (via lyric prose) as the signifiers of a fantasy medium or dimension. Looking at it from this perspective, the linguistically virtuoso lyric poetry gets mystified, and becomes the presentational form of the supernatural. It is true, however, that this change can be read in a way that it reflects reality-alienness.

The social-critical references appear in multiple works (the political issue and criticism of *A János vitéz-kód*, the obsession with pleasing everyone and cyberbullying of *Lajhár, a sztár*), but since the texts approach these questions in a subtle way, and they appear as the organic problems of the characters' lives, they strengthen the double-edged aspect of the works. The same is true for those (life) philosophical questions, which are asked by the lyric I of *Éjszakai kert* (transcendent, latent world order), *Nincs itt semmi látnivaló* (religious pluralism, creative imagination), and *A bátyám öccse* (the personal importance of found and private properties). The fact that the applied literary and didactic nature of the works are pushed into the background is in favor of the aesthetic, but the teaching aspect was not completely removed from all creations (it can be found in Takács's and Edina Kertész's works).

The effects of the postmodern text-creating strategies can be felt on the analyzed corpus as well. This is especially true for the book by Borbála Szabó, which manages Petőfi's *John the Valiant* not only as a hypertext (*Bingaminga és a babkák* is in such connection with *The Lord of the Rings*), but it is its palimpsest and palinode as well, that is, it is its loyally rewritten version and its anti-song at the same time. With this, the work proves that the most innovative literary text-games do have their place in children's literature – they only need to be applied properly.

From a poetic perspective, the varied humor of the work is exciting, together with the roleplay of the lyric I / narrator. Kiss's lyric I, even against all conflicts, is inseparable from the big brother, which is also signaled by the fact that the big brother's voice manifests itself in the little brother's mediation. Their anonymity does not only strengthen this dependence, but it also makes their roles applicable to all siblings. Dániel's lyric I tops this by genderlessness, which enables all readers to identify with it. Erzszi Kertész's narrator is elusive, sometimes seems to be closer to one of the characters, sometimes to the other, and Borbála Szabó's (as a good postmodern storyteller) is a character, identifies with the writer, and is not only omniscient, but also omnipotent. Thus the narrator of contemporary children's literature has a tendency to draw attention to itself at least by diverging from the classical heterodiegetic position.

Being true to children's literature, most analyzed works are illustrated creations, although we can talk about prominent and active illustrations only in case of the *Lajhár, a sztár* (the drawings created [also] with the formal elements of Instagram, which motivate creative work), the *Éjszakai Kert* (the tones and forms of the pictures reflect a dimension shift), and the *Nincs itt semmi látnivaló*. From this point of view, András Dániel's picture book is the most significant achievement of the corpus,

since here the textual and visual elements build the word of the work while supplementing, and not reflecting each other.

Another important characteristic of the analyzed books is that they activate the readers and they motivate co-creation. Mari Takács's rhymes and nonsense-like magical spells call for reciting, and Borbála Szabó's verses ask for multileveled decoding (from the solving of mathematical problems to the deciphering of the boundaries of blended and rewritten texts). Edina Kertész provides tasks for readers along the strategies of reading didactics, Erzszi Kertész, by using names that predestine, stimulates us to decode the meaning of our own names, and the works of András Dániel and Ottó Kiss motivate us for the fragmentation of our individual associations and sibling-adventures into a children's monologue. Thus, they can be excellent foundations of various creative writing, group building, communication and creativity developing tasks of experiential education (N. Tóth – Petres Csizmadia 2015, 297–322; Puskás 2019), which – supported by appropriate pedagogical communication (Horváthová – Szóköli 2016) – give us the basis of student-centered and problem-based learning (Tóth 2019, 83–100). In the same way as children's literature provides the basis of literature.

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Primary Paper Section: A**Secondary Paper Section: AJ, AM**

SOCIO-ECONOMIC DISPARITIES CAUSED BY PANDEMIC IN CROSS-BORDER AREAS OF SLOVAKIA

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Abstract: This article focuses on the cross border rural areas located in the suburban zone of big agglomerations in border regions of Hungary and Slovakia. Special attention is devoted to demographic processes and phenomena related to these facts. Besides generally acceptable statistical data represents other data collected via field research in communities representing suburban survey. It focuses on socio-economic effects of suburbanisation, analyses its impact on society of suburban inhabitants in Slovakia. There is a comparison between cross-border survey about the suburbanized rural life standards before and after 2020 to predict current trends influenced by pandemic. Added value is the results of measuring gap in economic and demographic development in the cross-border regions mainly between Hungary and Slovakia during COVID-19 pandemic

Keywords: regional development, disparities, socio-economic impact, suburbanization, pandemic

1 Introduction

The choice of the research topic is justified since cross-border agglomeration, which is a common phenomenon of current globalization, is multifaceted and highly relevant today and it got.

As COVID-19 developed holiday homes in rural areas of Bratislava, the rural environment has been given a more varied image through suburbanization, especially in the last year of pandemic. Such research originates back to the principal idea that a certain geographical space, a settlement, or a landscape, means much more than just a simple element of space. The motivation for moving from big cities to rural suburban regions can be currently twofold, the regular suburbanisation process and the pandemic caused changes.

The consequences of the coronavirus pandemic will have a fundamental impact on the economic, political and social spheres of our society. The coronavirus epidemic has revealed specific and general problems of the EU, Slovakia and cross-border region and the global society.

It sent a long-unseen challenge, burdening the entire social system with a variety of difficulties from problems associated with physical diseases to problems associated with social and economic development. Consequences are unknown and unpredictable, the likely economic, political and social consequences of the current pandemic are already demonstrating their essence.

More and more scientists and experts are expressing the opinion that humanity has entered a new stage in the formation of the world order. What will become a society of suburbs after pandemic? How will socio-economic disparities develop? How will bilateral and cross-border society react and arise?

2 Literature review

From economic point of view, the negative impact of the coronavirus epidemic is measured not only by the number of people infected and sick, but also by the economic consequences that have arisen in connection with it. Thus, the coronavirus affected all global markets, which led to a drop in stock prices and bond yields. In addition, this epidemic has led large institutions and banks to lower their forecasts for global economic growth. However, the European Commission (further

as EC) has lowered its forecast for the global economic downturn due to the COVID-19 pandemic in 2020 to 3.8%.¹

The EC also lowered expectations of economic recovery in 2021 to 4.7%. In the spring, a decline of 2.9% in 2020 and a subsequent recovery of 5% in 2021 were forecast.²

The epidemic had a negative impact on the service sector, retail trade, tourism, and brought sharp restrictions on various types of transportation, which could not but affect the economics and business in many countries. The consumer market has been significantly reduced.³

In general, on the outskirts and periphery of a big city as Bratislava outlines processes that take place in the so-called rural-urban fringes. Regarding functionality, there is a debate as to whether suburbanization (building a new city) or urban sprawl is taking place. Regardless, the results are newly established residential districts around the city.⁴

Indicators of the process are migration growth, the housing and housing stock. These are both quantitative and qualitative increases, moreover the consequences are better in the field of technical infrastructure, higher land and real estate prices, changes in the structure of society segregation of houses.

Suburban growth creates a population between the central city and the suburbs, leading to changes in the demographic and sociological indicators of the suburban population (socio-demographic approach) and the spatial structure of the suburbs.⁵ New constructions in the suburban environment can be defined as modern uniformalized residential areas that are ready for family homes or individual construction on plots offered by an investor or massed new development areas.⁶

With this form of possible individual house construction on vacant plots as part of existing installations and create identity of the region and its inhabitants.⁷

Survey on satisfaction with inter-fraud suburbanization and reducing of urban vulnerability in other perspective examined satisfaction with the services and institutions provided by the municipalities, majority of the residents do not to their satisfaction.⁸

Based on previous research from Hungary this predominantly complaining layer for their villages is mainly lacked by services like health care provider, post office, pharmacy as factor for regional differentiation.⁹

Lack of schools in suburban settlements and cities arose during COVID-19, because home-schooling was provided as only option. In the survey group as well, the responses of residents

¹ European Commission: *Strategy and Policy COVID- 19*. Brussels: EC, 2022. [online]. [cit. 2022-01-03]. Available at: https://commission.europa.eu/strategy-and-policy_en

² Burns, Yu. *The European Commission has lowered its forecast for a global economic downturn in 2020*. [online]. [cit. 2022-01-03]. Available at: https://commission.europa.eu/strategy-and-policy_en

³ Bouregard, R.A *When America Became Suburban*. New York: 2006 . p 3.

⁴ Šveda, M. *Suburbanizácia v zázemí Bratislavy z hľadiska analýzy zmien*. Bratislava: SAV, In: Geografický časopis, vol. 63, no. 2.2011.

⁵ Šýkora, L. *Proměny postsocialistických metropolí*. In: Geografické rozhledy 23 (4), 2014. p 65. ISSN 1210-3004

⁶ Kadri, L. *Residential Suburbanisation in the Tallin Metropolitan Area*, Tartu: University of Tartu, In: Journal of Rural Studies, Vol. 5, p.123–136X

⁷ Jablonczay T.- Grajczár T. *Területi identitás stratégiák*. Dabas: Felső-Homokhátság Vidékfejlesztési Egyesület. 2014.p 56.

⁸ Tobin, K.: *Reduction of Urban Vulnerability*. Coldwar History Volume 2, New York: Frank Class

⁹ Balizs - Bajmócy, B. *Rajka – Rapid changes of social, architectural and ethnic character of a cross-border suburban village*, In :Tér és Társadalom 32. évf., 3. szám, 2018.

here are clear complaints in this area. Bratislava's preference is more significant because the correlation is high. As a result of research, it was planned to achieve that by evaluating the present situation in the most "suburbanized" localities get questions and answers with the intention of meeting the current needs of the residents make recommendations to decision-makers during the survey.¹⁰

In micro-region of Bratislava - Győr suburbia all the answers should be taken into account when defining long-term plans, it is important that the residents themselves can help to create a regional image for suburban development.¹¹

In the case of Microregion so called "Rye Islands" in Slovak „Žitný ostrov“ geographically built as natural river-island created inbetween Danube near Bratislava, there were found great differences between the natives and the emigrants in our opinion, if we want to compare the border residents with the Indigenous people of Rajka its dissatisfaction could be paralleled.

In contrast, Austrian example is not delivered, however it is possible to find a questionnaire survey following the similar cross-border identity, with local content analysis. It can be argued that the residents of Bratislava living there are more distant they complained from the Austrians, but there was no shortage of services. Based on the projects, we see that the Danube connects, but the borders still separate, but the however, there is no limit to suburbanization. Cross-border suburbanization is one an extremely delicate process of spatial development with poor and less bad solutions are born because of the opportunities.¹²

The prices in the housing market and the surrounding countries all offer contribute to the decision.¹³

3 Research problems and goal

Through the COVID-19 virus crisis and the high preventive measures that accompanied it, and based on the massive use of social contacts in suburbia, it is imperative for each user to adopt positive social behaviour such as moving workplace, sharing and cooperation in order to overcome this crisis. In addition, the individual should highly prove being a valid citizen by carrying out the duties of citizenship through this change of permanent address from the real place of origin to the suburbia.

The research identified its problem as studying the role of suburbias during pandemic in particular in promoting changed positive behaviour to deal with the COVID-19 pandemic as a crisis experienced by all members of society and its institutions amongst a sample of inhabitants changing permanent addresses, which is an economic, social and identity related issue. This shift of official seat or permanent address usually comes with taxation, social dependence and belonging status to the land and region.

The importance of this article stems from the importance of the topic itself as it deals with, both the positive behaviour and the COVID-19 pandemic crisis and their related variables. In fact, they got great interest and care by specialists, especially with the unbridled growth of permanent address change from the capital toward the suburbia, smaller towns and periphery, focusing on this global pandemic of COVID-19 virus, which has affected profoundly all economic and social joints of life.

¹⁰ Malhorzata F.– Liszieszky, M. *Demographic Consequences of suburbanization in selected towns in the eastern borderlands of Poland*, online: <http://apcz.u.mk.pl/czasopisma/index.php/BGSS/article/viewFile/v10089-010-0011-4/1549>

¹¹ Ministry of Foreign Affairs SR, *Obmedzenia ministerstva zahraničných vecí (Restrictions of Ministry of foreign affairs)*, 2014.

¹² Pawera R.-Bott D.L., *QUAERE 2020 Volume 4, Hradec Králové : Magnaminitas , Česká Republika ISBN, 978-80-87952-32-0.*

¹³ Van den Berg L. *Urban Systems in a Dynamic Society*. Aldershot, UK: Gower.Gower PubCo. ISBN-13: 978-0566052514 ISBN-10: 0566052512

The importance of the study is also determined from an applied point of view in transforming its results to a set of recommendations. These conclusions may contribute to enlightening those interested in this crisis, from various social, economic and political institutions, to the reality of positive behaviour through the change to enhance its role in a better way through programmes designed to face this crisis.

Accordingly, this study set its objectives as follows:

- *Identifying the relationship of changing permanent address to promoting positive behaviour during the COVID-19 crisis.*
- *Interpreting the differences in the level of changed socio-economic behavior through suburbanisation during the COVID-19 crisis according to the variables of before and after covid (2019 and 2022)*

4 Methods

As for research methods qualitative interviews and quantitative survey forms were distributed. We tested a hypothesis as follows. This survey was conducted between June- September the year 2022 on local community represents suburbians who moved during, after or due to COVID – 19 withing cross-border suburbia and changed address.

The research sample was taken using the purposive sampling method and it consisted of ($N=500$) individuals. After that, the study tool was designed, which is the online questionnaire via the Google Forms application. To verify the psychometric conditions of the tool, the apparent honesty of the tool was ascertained by presenting it to a group of arbitrators with science, experience and knowledge in the fields of scientific research and sociology for evaluation.

The internal consistency was checked by calculating correlation coefficients between the grade of each phrase and the total score of the questionnaire. It was found that the correlation coefficients of each of the scale phrases and the total score of the scale were all statistically significant at the level of significance (0.01), which indicates the availability of a high degree of internal consistency of the scale.

To verify the stability of the search tool, the researchers used the Cronbach Alpha standard and the total reliability coefficient of the questionnaire was (0.952). These high values of the reliability coefficient indicate the validity of the tool for application and the reliability and validity of its results. To achieve the objectives of the research and analyse the collected data, One-Sample T Test, One - Way ANOVA to determine the size of the sample effect.

5 Results and discussion

The results of the study showed the following hypothesis were tested and proved. The first question: *What is the level of willingness to move the permanent address from one settlement (SK) to other (HU) during pandemic to suburbia?* To answer this question, the statistical method represented by the arithmetic average and the One-Sample T Test was used at the level of significance ($\alpha = 0.05$)

Tab 1. Willingness Limits

Willingness Limits	Range	Limits
Strongly disagree	1.00 -1.80	Very Low
Disagree	1.81- 2.60	Low
Neutral	2.61-3.40	Average
Agree	3.41-4.20	High
Strongly agree	4.21-5.00	Very High

The arithmetic average was 4 and freedom axis 500. and T value 11.48. Added to that, the nature of their interaction of the move from one country to other or within the region in terms of Bratislava surrounding. In terms of the passed period that was characterised by staying at home due to quarantine, reducing outdoor hours, working remotely, which provided a tremendous

opportunity for inhabitants to highlight their positive behaviour toward moving to suburbia from their original address reaching the percentage of consensus and high approval. Thus, they achieved their quest for a sense of community, breaking the feeling of loneliness in capital city and social isolation, satisfying social, economic and service-based needs and bonding with members of the group in the suburban towns. It may also be attributed to the extent of the expansion of reliance on that between 2021-2022 the large number of shifting permanent addresses were noted and registered in the suburbia.

As for the approval of 11.4% of inhabitants, this may be attributed to the multiplicity and diversity of unofficially registered suburban addresses were characterised by reliability and high rates compared to the rest of the inhabitants.

Another question was: *Is there a statistically significant relationship between the move from capital city (Bratislava) to suburbia and the period of COVID-19 crisis?*

Tab 2. Correlation between suburbanisation and pandemic decisions (change address, educational institutions, office move)

Axis	Pearson correlation coefficient (R)	Impact Size	Sig P value
Relationship between permanent address change and pandemic crisis	0,33	1,5	0,00
Relationship between moving school and educational institutes during pandemic crisis	0,27	0,06	0,00
Relationship between moving offices and pandemic crisis	0,33	0,5	0,00

From the above results, it is clear that there is a positive, medium-strength, correlation between move of homes, schools and offices and with the effect of COVID-19 crisis. This means that the greater the more inhabitants move, the greater the fear of the pandemic appeared to be the COVID-19 crisis to a moderate degree is, and vice versa.

The effect size was (0.154), which means that permanent address changes (15.4 %) have relative high impact on COVID-19 crisis. Along the with statistics by regional development data we compared the origin of the regions, where the suburban citizens come from the capital and southwestern region. Therefore we tested their move during pandemic.

From the previous One-Way ANOVA analysis of the administrative region variable, it is clear that there are statistically significant differences in the opinions average of the sample members about the willingness to change their permanent address to their holiday home, suburban home in promoting positive behaviour due to the variable of the administrative region. The impact size is (0.027), which is a weak impact. (2.1%) of the changes in the level of positive pandemic growth. The third question was how is there a correlation between the region of origin and the willingness to move to suburbia?

Tab 3. One Way ANOVA analysis of the administrative regions

Region of Origin of Inhabitants	Number of Inhabitants	Average	Standard Deviation	F value	P value
Capital City Bratislava	106	3.38	0.74	3.17	0.013
Eastern Region	44	3.61	0.89	3.17	0.013
South-Western regions (original region)	336	3.36	0.85	3.17	0.013
Northern Regions	14	4.04	0.662	3.17	0.013

This correlation was not proved by strong relationship. While asking about the missing service in suburbia in 2019¹⁴ respondents answered health care and hobby as a priority, in 2020 schools and services became the focus of the interest and in 2021 health provider and basic food shops and services, as well

as closeness tonature. For motivation to move into suburbia the newcomers presented the closeness to capital and rural countryside. There was no point to move into capital and travel every day in 2020-2022, this was supported by slighter shift of permanent address.

In 2019 survey¹⁵ there were three common "mindmap" associations created about Slovak – Hungarian crossborder suburban area, there were the followings: closeness of Bratislava, workmarket and logically lower prices of immobilities as in the capital. Controversary, in year 2022 these advantages became more flexible in terms of home-offices and dominated quiet place, lower prices, family houses. There were several environmental qualities of life mentioned on rural countryside as pure drinking water and natural treasures, but on the other hand.

Surprisingly, the most common answer were just cheap housing and Bratislava's closeness. Inhabitants of the smaller settlements proved to be more culturally, socially and publicly active during interviews and opened questions. Another assumption is thus the relationship between Hungarian and Slovak residents examined the importance of the micro-regional economy, it can be concluded that expected accordingly, the micro-regional economic level and local companies are rather important for indigenous peoples.

Meanwhile, the capital city's presence is important for having shared centers, multinational companies are more important for those who have moved to suburbia. It also appeared several times in survey, how they nominate themselves. Before pandemic the places were called sleeping cities, satellite towns, garden towns, suburbanias and it turned out that their lives changed due to pandemic and they became to call it „homes“ and „small town“.

5 Discussion

Slovak Republic suburbanization became even more complex based on pandemic facts, there is no relevant prognosis available towards demographic grow, neither the population trends nor the covid effect is calculable. There is a different nature, there is a mountain and rural history apartments. On the other hand, the name of the other Member State shall be subject to the spring, the railway station always has a special position in Bratislava and Győr, it is very important to change the quality of the research.

The number of peripheries in the region in the field of trade, in the field of trade and agriculture, intensive care of countries, regions and cities. This includes sustainable development, regional and management strategic development and font-based documents, including local authorities, provide information and advice on how to provide information, for whom are interested in one of the most important projects and suburban areas number of inhabitants.

The comparative study shall be carried out in the Hungarian and Slovak languages, in the north of Austria. This is a natural and important forecast in the framework of the Community, which is the subject of the European Union's programming, and, in the field of sustainable innovation, development of cities and five specials for each other.¹⁶

In another comparative method for mobility mapping it was also found that in similar spatial study by monitoring permanent address a study of doubly constrained gravity model was

¹⁴ Bott, D.L. *Cross-border suburbanisation of Bratislava*. In: CER Comparative

¹⁵ European Research 2020 of the 14th Biannual CER: Vol. 7, no. 2. – London. SCIEEMCEE, 2020. - p. 60-64 [online]. - ISBN 978-1-9993071-6-5

¹⁶ Sadiq, M. *Policing in pandemic: Is perception of workload causing work-family conflict, job dissatisfaction and job stress?* In: Public Affairs. Vol 2. Harvard Press:2020

estimated using generalised linear mixed - effect models for journey-to-work flows in Montevideo, Uruguay.¹⁷

Study has found out the same journey used without moving permanent address. Under the mixed model by framework Poisson and negative binomial regression models were estimated to find a better fit for the last distribution used. The model specification improves the parameter estimation by up to 15% which means for our research a comparative result, as our sample of the survey was willing to move spatially in 10% based on migrations and home changes.¹⁸

The results were also compared with a generalized linear model GLM of the same study, where specification improved showing that consideration regions as fixed effects are insufficient to predict independence among flows.¹⁹

We can close this comparative method deduction as slightly similar to the hypothesis findings in other territorial and time-specific level.

5 Conclusions

In conclusion, it is highly recommended that local governments observe the regulatory principles of environmental economics using spatial planning tools as some of them complained about infrastructure, transportation and mobility, as well and take care of security in terms of pandemic and provision.

These include thinking about the area, including its attachment to neighboring settlements, neighboring countries. The second added value of the research article is the comparison of sociologic and geographic aspects caused by COVID-19. Epidemic trends as a new viewpoint for suburbanization and the inhabitants' perception in the field of regional development research identify negative traits, but solutions are moving not forward in the last 10 years.

Correlation between changed permanent address and shift of the services to suburbia was higher during COVID-19 as it was shown. Data correlated with the year after pandemic and the growth of population. The density of population is not always a positive decision point, but the concentration of relatively skilled service-based centralized work market could be therefore centralized more extensively.

Main added value of the research article is that at least 10 % high permanent address shift in cross-border area of Hungary and Slovakia was based on data caused by demographic growth. The move in official form at this moment are wider due to suburbanization, they are present positively for the capital city and negatively for the surrounding suburban region.

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¹⁸ Chun, Y. *Modelling network autocorrelation within migration flows by eige spatial flitterins*. 2018. New York: In: Journal of Geographical Systems 10: p 317-344

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ATTITUDES TO CHEATING AS A PREDICTOR OF ACTUAL CHEATING BEHAVIOUR: COMPARATIVE ANALYSIS OF STUDENTS OF MASTERS PROGRAMMES IN BUSINESS IN SLOVAKIA AND CROATIA

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This paper is a partial output of the project of the project VSTE v Českých Budějovicích, "Identification of elements of ethical management and CSR in SMEs".

Abstract: The aim of this study was to gain an insight into the attitudes of students of masters programmes in business towards cheating in exams and how to prevent this and instigate behavioural change. This was done by measuring the actual incidence of cheating, as well as the relationship between attitudes towards cheating and actual behaviour, in order to predict the willingness to cheat. The practical problem was solved by means of selected scientific theories and approaches to attitude and behavioural change in universities and business organisations. The results of the research presented are based on a questionnaire survey conducted among students of masters programmes in business in Slovakia (N=241) and in Croatia (N=156). The questionnaire examined the ethical attitude towards cheating (N=5 items) and the methods applied to cheat in exams (N=10 items). The survey revealed that 83.4% of Slovak and 93% of Croat students of masters programmes in business engaged in some form of cheating behaviour and that the attitude of Slovaks and Croats to cheating statistically significantly differed. A positive attitude towards cheating was found to be held by 17% of Slovak students and 18.6% of Croat students (statistically insignificant difference), a neutral attitude by 47.3% of Slovak students and 30.1% of Croat students (statistically significant difference), and a negative attitude by 34.4% of Slovak students and 51.3% of Croat students (statistically significant difference). The lowest level of cheating behaviour was among those students with a negative attitude to cheating (Slovak sample 19.1% or N=16 hypocritical students; Croatian sample 44.3% or N=35 hypocritical students). Having a positive or neutral attitude to cheating was an excellent predictor of cheating behaviour; a negative attitude proving much weaker. The obtained results have strong implications for the reputations and credibility of universities, as well as have a major impact on organisational behaviour/human resources management (OB/HRM) in business organisations. For universities, the implementation of the Ajzen theory of planned behaviour is proposed. For cheating behaviour in business organisations, preventive and reactive OB/HRM measures are proposed.

Keywords: Cheating, cheating behaviour, attitudes to cheating, hypocrisy, Ajzen theory of planned behaviour, organisation behaviour, human resources management, OB/HRM.

1 Introduction

Although definitions of academic cheating are not exact, as is the list of cheating behaviours, and definitions differ greatly across cultures (Šorgo, et al., 2015), it is important to gain an initial insight into the concept in order to aid research and the subsequent communication with those potentially involved. Cheating or academic dishonesty in order to gain real or perceived benefits is a common phenomenon among students. According to Lambert, Ellen and Taylor (2003:98), academic dishonesty is the behaviour that breaches the submission of work for assessment that has been produced legitimately by the student who will be awarded the grade, and which demonstrates the student's knowledge and understanding of the context or process being asserted. Academic cheating includes behaviours such as cheating in an exam, stealing a test, copying from someone else's exam, plagiarism, the use of aids, crib sheets and modern technologies. It is worth noting that the methods and the character of cheating are evolving as technology develops.

In terms of seriousness, when an academically dishonest person gains real or perceived benefits from breaking established rules, academic cheating comes very close to corruption and is therefore justifiably recognised as a threat to academic integrity (Heyneman, 2004, 2014; Šorgo, et al., 2015; Gabor, et al., 2018; Whitley et al 1999). Lawson (2004) found that students of business studies who cheat are more likely to be accepting of unethical workplace behaviour. There is also a growing body of evidence of a positive correlation between cheating while in college and unethical behaviour in the workplace. Cheating in

exams is therefore an important topic for future human resources management, especially in business-oriented workplaces, because cheating in exams may be a good predictor of unethical business behaviour. Widespread cheating in academic institutions can also be extremely dangerous for society, as well as organisations, especially if those students that passed their exams by cheating do not know how to do their jobs properly, thereby causing serious harm (e.g. a bridge collapse due to lack of knowledge or a moral deficit).

It has become obvious that the issue of cheating in higher education institutions is being reflected on the labour market and in the expectations of human resources managers. After all, if the expectation is that almost all or a great deal of all human resources cheated to obtain their degrees, they will also cheat or show unethical behaviours in their future working life. This creates a philosophy and initiates behaviours similar to those outlined in McGregor's Theory X: "humans don't like working, that organisations should coerce them to work, that humans are evil...". In response, organisations therefore require a strong hierarchy where a management of fear applies, with stringent control mechanisms, punitive measures, manipulation and other unpopular management methods persist.

A tolerance of cheating also corrupts the principle of "doing the right thing", leads to the erosion of academic integrity (values of honesty, truth, respect, fairness and responsibility), diminishes the value base of the education received and damages the reputation of academic institutions. It is therefore socially, organisationally and economically important to have an insight into the phenomenon in order to futureproof human resources development.

According to Liebler (2015), the level and prevalence of cheating is continuing to increase in higher education. According to Cazan and Iacob (2017), 74% of high school students and 95% of college students cheated at least once. According to McCabe, Trevino and Butterfield (1995), from 50% to 90% of students in USA cheated at least occasionally. A study by Rettinger and Kramer (2009) found that 73.4% of the undergraduate students questioned cheated at least once. Stern and Wallbaum (2001), in their research into cheating among business students in USA, found that nearly three in five students had cheated during college, males (69%) more than females (47%). The main methods were: 28% copying from a neighbour, 18% using old tests, 16.6% saving formulae on a calculator, 11.8% writing answers on the desk, 10.2% using a crib sheet, 7.9% writing answers on hands/arms, 3.5% using hand signals, and 3.5% other methods. According to McCabe and Trevino (1995), business students were more likely to commit dishonest acts than other students. Tetzeli (1991), in a survey conducted across 31 universities in USA (over 6,000 participants), found that 76% of business students cheated at least once, respectively 71% of engineering students, 68% of medical students and 66% of students who wanted to work in public service.

Šorgo, et al. (2015), on a Slovenian sample N=323 (country near Croatia, in the same state until 1991), found that almost all high school students cheated occasionally (91.4%) and that 99.1% of them had observed cheating. The authors concluded that cheating is normal, almost a "way of life" in Slovenian schools.

On a Croatian sample of medical students, Kukulja Taradi, Taradi and Đogaš (2012) found that 97% of students admitted using some method of cheating. Most of them (93%) allowed someone else to copy from their test, 89% helped someone else to cheat on a test, also 89% of fifth year students got exam questions from someone who had already taken the test and 82% copied from another student during a test or exam with their knowledge. In Croatia research into student cheating is very rare;

none into cheating among students of business studies, and none into the relationship between attitudes to cheating and actual cheating behaviour.

Hallová and Hanová (2016) found that in a sample of students from the Faculty of Economics and Management in Nitra, Slovakia, 77.6% of them had cheated at least once. They had mostly cheated by using crib sheets (21.79%), followed by electronic devices (12.50%) and transcribing from someone else (11.32 %). In Slovakia, as in Croatia, research into the issue is also very rare.

Gehring, Nuss and Pavela (1986) suggest that students cheat for several reasons, namely: it's unclear what constitutes academic dishonesty; the subject of learning isn't relevant for them; the ability to succeed is a cherished value; the risk of being caught is low; and they want good grades. According to Sulphey and Jnaneswar (2013), some students cheat because they think no one gets hurt and the study material is too hard. According to Jones (2011), students cheat because they want better grades, with procrastination, no time and too many obligations cited as the main reasons for this behaviour. Murdock and Anderman (2006) found that the most used techniques by students to neutralise academic cheating were condemning the condemners (e.g. teachers give exams that are unfair), appealing to higher loyalties (e.g. I had to give them the answer) or to peer norms (e.g. everyone does it). Yu, et al. (2016) found that college-age students who have a strong self-oriented purpose in life are more likely to engage in academic misconduct, whereas students who have a stronger level of beyond-the-self purpose in life are less likely to do so. Those students who are less likely to cheat are those who spend more time preparing for classes, females and students from high-income families. Those students who are more inclined to engage in academic misconduct are those whose opinion on cheating is more tolerant. In a survey conducted by Elias (2015), the results showed that high Machiavellian business students viewed cheating as less unethical.

Past research indicates that students' attitudes towards cheating have a better explanatory power for actual cheating behaviour than other factors (Graham, Monday, O'Brien and Steffen, 1994). It is therefore important to investigate attitudes towards cheating and their connection/correlation with actual cheating behaviour in specific cultural environments. A review of literature on academic cheating reveals that few studies have examined cheating among Slovak and Croat university business students, in particular their attitudes towards academic dishonesty and the link between these attitudes and actual cheating behaviour. In the research presented herein, we analyse the attitudes towards cheating and the actual cheating behaviour of business students in two different countries.

2 Contributions of this study

A review of literature on academic cheating revealed that very few studies have examined the incidence of cheating among Slovak and Croat university students; none among students of masters programmes in business, with the most relevant studies having been conducted in Western countries. Beyond this, not a single study in Slovakia or Croatia was found to have examined the attitudes towards cheating as a predictor of actual cheating behaviour. In addition, no study was found that looked into the cheating behaviour of business students and their future behaviour in business settings.

The contribution of this study is to show the incidence of exam cheating behaviour in relevant populations of students of masters programmes in business (future business people and managers) and to determine the predictive value of these attitudes towards cheating in relation to actual cheating behaviour. This study is relevant because attitudes towards cheating and actual cheating behaviour are important predictors of future organisational behaviour (cheating in university settings is a predictor of cheating in organisational settings, whereby such behaviour among key business people, managers, CEOs and politicians has

a very dangerous impact on organisational efficacy and society as a whole). This study is therefore a scientific contribution to the discipline of organisational behaviour/human resources management. In a practical sense, it is important to have insight into the methods of cheating behaviour and how they change, whereby the Ajzen theory of planned behaviour (Ajzen, 1991, 2006) is seen as appropriate for this purpose.

3 Aims, problems and hypotheses

This study investigates academic cheating in terms of the attitudes and the actual cheating behaviour of students of masters programmes in business at universities in Slovakia and Croatia, including a comparison of the obtained results. The aim of the study was to see how many students cheat in exams, i.e. to gain insight into the phenomenon (use of cheating methods), what their attitudes towards cheating are (positive, neutral, negative) as a measure of their ethical values, and more specifically, if there is a difference between attitude and actual behaviour (cheating) in each sample (measure of hypocrisy), as well as between the two samples (cultural difference towards academic cheating). To achieve this aim, we defined several research problems and hypotheses:

Problem 1. How many Croat and Slovak students cheat in exams (use of cheating methods) and is there a statistically significant difference between the two?

Hypothesis 1. Based on existing research data on cheating in Slovakia and Croatia, the incidence of cheating will be greater in the Croatian sample.

Problem 2. Is there a statistically significant difference between the Croatian and Slovakian samples with regards to their attitudes (values) towards cheating (cultural differences)?

Hypothesis 2. Based on the expectation that a statistically significant difference exists between the attitudes towards cheating (values) among Slovak and Croat business students, cheating behaviour is positively connected with attitude towards cheating, and so a greater incidence of cheating behaviour should be reflected in a more positive attitude towards cheating.

Problem 3. How many students have a positive, neutral or negative attitude towards cheating and what is the relationship between such attitudes and actual cheating behaviour in both countries?

Hypothesis 3. Based on the expectation that a positive or neutral attitude towards cheating is a good predictor of actual cheating behaviour, and that a negative attitude towards cheating is a less good (bad) predictor of non-cheating behaviour, a negative attitude towards cheating is reflected in a higher level of cheating behaviour (due to hypothesised hypocrisy) than is theoretically expected in an ideal situation (e.g. if 10 students have a negative attitude towards cheating and none of them cheat).

4 Methodology

Our research was conducted among students of masters programmes of management at the Faculty of Economics, University of Split, Croatia, the Faculty of Economics, University Matej Bel in Banská Bystrica, Slovak Republic and the School of Economics and Management in Public Administration in Bratislava, Slovak Republic. The data were collected during the 2016/2017 academic year.

4.1 Measurement instruments (questionnaires)

The questionnaire created by the authors consisted of two parts (Part A and Part B), with in total N=15 items.

The intention of the items (statements) in Part A was to measure attitudes towards cheating. The statements were: 1. Cheating in an exam is wrong; 2. Cheating in exams should never be applied no matter the circumstances; 3. I prefer to cheat as an individual; 4. I prefer to cheat as a group (collective); 5. For me it is appropriate to cheat casually (reversed item-R). Items 1,2 & 5 in Part A were composite and set out to determine the respondents' attitudes towards cheating in exams, whereas items 3 & 4 sought

to determine the preference for cheating on an individual level or as a group. The responses to the statements in Part A utilised a 5-point Likert scale: 1. I strongly disagree; 2. I disagree; 3. I do not agree nor disagree; 4. I agree; 5. I strongly agree.

Part B of the questionnaire consisted of N=10 items. The items (statements) sought to establish how often students use specific cheating behaviours (cheating methods). The statements in Part B were: 6. I cheat by looking at a neighbour; 7. I buy questions and assignments from prior generations; 8. I exchange tests so that I and my neighbour have the same test; 9. I use formulae and aids stored in my calculator; 10. I write the answers on the desk; 11. I use crib sheets; 12. I write answers on my hands; 13. I use specially created tools for cheating; 14. I use modern equipment/technology to cheat in exams; 15. I use other cheating methods. Part B utilised the following response scale: 1. I never act in such a way; 2. I do not act in such a way; 3. I sometimes act in such a way; 4. I often act in such a way; 5. I always act in this way.

In order to determine the relationship between attitude towards cheating and actual cheating behaviour, the authors used a questionnaire consisting of 13 items divided into two parts (according to the area of interest):

1. Attitude towards cheating - 3 items created one variable (i.e. item 1, 2 & 5), which measures the acceptability of cheating (internalised value). The reliability of the variable (composite items) for both samples was acceptable (De Vellis, 1991), i.e. for the Slovak sample, the reliability Cronbach alpha was 0.73, and for the Croatian sample 0.70.¹

2. Cheating behaviour - 10 items consisting of 10 different forms of cheating behaviour, whereby each item created one variable.

4.2 Research participants

The following participated in the study:

- a) Croatian sample - N=156 (N=99 female and N=57 male) students of masters programmes in management (with specialisations in project management, accounting and revision, tax and financial management) with an average age M=23.80 years attending the Faculty of Economics, University of Split, Croatia; and
- b) Slovakian sample - N=241 (N=171 female and N=70 male) students with an average age M=25.96 years. This sample consisted of students attending masters programmes in management (including small and medium entrepreneurship) at the School of Economics and Management in Public Administration in Bratislava, Slovakia (N=178) and students from the masters programme in finance, banking and investment at the Faculty of Economics, University Matej Bel in Banská Bystrica, Slovakia (N=63).

4.3 Procedure

Before the research was undertaken, all the interviewees received instructions and were familiarised with the type and objectives of the study. They were also asked for their permission to be included in the study, with only those that agreed to participate included. All the questionnaires were filled (paper-pencil method) in anonymously within approximately 5 minutes. The data processing was carried out using the SPSS statistical software package.

5 Results and discussions

5.1 Result and discussion concerning research problem 1

The results showed that many of the students in both samples cheat. In the Slovakian sample, cheating could be attributed to

83.4% of business students (201/240 x 100), a result similar to the 77.6% recorded amongst students at the Faculty of Economics and Management in Nitra, Slovakia (Hallova and Hanova, 2016). In the Croatian sample, cheating could be attributed to 93% of business students (144/240 x 100), which is close to the 97% recorded for medical students in Croatia (Kukulja Taradi, Taradi and Đogaš, 2014).

Findings from Slovenia, a neighbouring country to Croatia (Šorgo, et al., 2015), showed that almost all high school students in the sample (N=323) at least occasionally cheated (91.4%) or had observed cheating (99.1%) during their high school years. The result, which was higher than expected, did not come as a surprise to the authors, and places Slovenian students in line with findings worldwide. They concluded: "Cheating is a way of life, with almost all students occasionally indulging in some form of academic misconduct. It seems that a culture tolerant or even supportive of such behaviour has been established among students, parents and teachers, all of them working together to "help" students climb the ladder of success."

According to the research results, in the Slovakian sample, 16.6% stated that they did not cheat, with this being as low as 7% in the Croatian sample. This is somewhat lower than that found by Tetzeli (1991) in USA (on over 6,000 participants in 31 universities) where 76% of business students cheated, and somewhat higher than that found by Cazan and Jakob (2017), where 95% of college students cheated at least once. In our sample (Slovakia and Croatia), the behaviour of non-cheating students compares well to other worldwide studies, confirming that this is indeed rare behaviour. As a result, not cheating in exams can be treated as a rare human resource/rare moral behaviour, even more so in light of the fact that hypocrisy means that such behaviour is rarer than the moral attitude itself. This finding implies that measures are required to instigate changes in behaviour.

The fact that only 7% of business students in the Croatian sample and 16.60% in the Slovakian sample don't cheat, and that this percentage could be even lower for other study programmes (e.g. only 3% for medical students in Croatia according to Kukulja Taradi, Taradi and Đogaš (2014)), is dangerous, socially, organisationally and economically. Users of services provided by such human resources would be justified in being afraid because a serious number of graduates cheated and therefore do not possess the professional competencies to do their work. (Šafránková et al., 2020) This fact should raise significant concerns about the future of human resources, which lack serious moral behaviour (and moral attitude)², which in turn has a potential negative impact on personal / organisational / social / economic well-being (see, for example: the dark side of business, organisation, management, innovation and entrepreneurship (Bogdanović, 2015 a, b)). It is also a sign of the moral degradation of academic institutions, which produce human resources that lack the necessary characteristics (in the professional and moral/ethical sense).

More students in the Croatian sample cheated than in the Slovakian sample. This was confirmed by the testing of the significance of the statistical difference ($p < 0.01$) of the two samples. The analysis revealed that (Chi-square=7.71; $p < 0.01$) statistically significantly more students cheated in the Croatian sample, thereby confirming the first hypothesis. Although the expectation was that a large number of business students in both samples would show cheating behaviour, the statistically significant difference was a surprise. The results of the analysis are presented in Table 1.

¹ According to DeVellis (1991), Cronbach alpha reliability should be interpreted as follows: <0.60=not acceptable; 0.60-0.65=borderline (can be treated as acceptable); 0.65-0.70=acceptable; 0.70-0.80=very good; 0.80-0.90=excellent; >0.90=the scale should be shortened.

² Note: ethics as a theoretical approach e.g. business ethics can be immoral, in the same way as a law can be unfair.

Table 1: Cheating and non-cheating students in the research sample

	Slovak sample	Croatian sample	Statistical significance (Chi-square)
Cheat (use some form of cheating)	N=201 (83.4%)	N=145 (93%)	$h=7.71; p=0.0055$ (statistically significant difference $p<0.01$)
Don't cheat (don't use any form of cheating)	N=40 (16.60%)	N=11 (7%)	$h=7.71; p=0.0055$ (statistically significant difference $p<0.01$)
Total number of students in sample(s)	N=241 (100%)	N=156 (100%)	--

Source: Author's own compilation.

The possible sources of the differences in cheating behaviours between the Slovaks and Croats could be cultural, i.e. upbringing, education, satisfaction of study social circumstances, i.e. society (Chládková, et al., 2021). The ethical behaviour associated with cheating may also be a matter of personality, for example, psychopathy, which has a genetic source (Pastuović, 1999, 223). Because genetic (personality) factors have not been investigated as part of this research, the only type which is discussed here is anthropological/cultural psychopathy, i.e. linked to socialisation. This difference explains why, when cheating is punished less than in Slovakia, and cheating in Croatia is viewed as more rewarding, that cheating is more prevalent in Croatia. In terms of the high ethical standards required of management/business students and the social benefits future students should bring to society, it can be stated that the situation in Slovakia is a little better because less students cheat, although the situation remains far from optimal (that 83.4% of students cheat should ring alarm bells). These results show a hollowing out of the ethical/moral situation in future human resources (most of them will be in leading positions and should uphold morals and not be prone to cheating/corruption), which should be of deep concern, and which requires appropriate preventive and reactive measures.

5.2 Result and discussion concerning research problem 2

Because attitude can be a predictor of future behaviour, the ethical attitudes of both samples were studied. The hypothesis that there is a difference in attitudes towards cheating was confirmed (a statistically significant difference was found $t=1.99; p<0.05$). Surprisingly, Croats have a more negative attitude towards cheating ($M=3.41$) than Slovaks ($M=3.32$), but cheat more (Croats 93% and Slovaks 83.4%), which is possibly an indication of greater hypocrisy by the Croats. The results are presented in Table 2.

Table 2: Differences in attitudes towards cheating in the Slovakian and Croatian samples

Variable	Slovakian sample			Croatian sample			Difference p value (t-test)
	Mean	Mode	Std. Deviation	Mean	Mode	Std. Deviation	
Attitude towards cheating (Items 1, 2 & 5).	3.23	3.33	0.82	3.41	3.67	0.96	$t=1.99$ $p=0.04$ (statistically significant difference at the $p<0.05$ level)

Source: Author's own compilation.

The results show that there is a general discrepancy between attitude and actual behaviour, although with the composite approach it is hard to know precisely how many students in both samples had a positive, neutral or negative attitude towards cheating and the relationship to actual cheating behaviour. This issue was resolved through the results obtained in relation to the next research problem.

5.3 Result and discussion concerning research problem 3

The results proved very interesting. The expectation was that both a positive and neutral attitude towards cheating should result in cheating behaviour, whilst a negative attitude should result in no cheating at all. In other words, in an ideal situation, i.e. with no cognitive dissonance or hypocrisy, those who think cheating is unacceptable will not cheat, and those who think cheating is acceptable or are not sure if cheating is acceptable,

will cheat. Surprisingly, this proved not to be the case in our sample. Despite their attitude towards cheating, more students cheated than expected. In the Slovakian sample, of the students with a positive or neutral attitude towards cheating, 64.3% were expected to cheat. In reality, 83.4% cheated (this means that the difference of 19.1% of students with a negative attitude towards cheating also cheated). This 19.1% can be seen as a measure of the hypocrisy in the Slovakian sample.

In the case of the Croatian sample, 48.7% of students had a positive or neutral attitude towards cheating, whereas in reality 93% cheated (therefore the 44.3% of students with a negative attitude towards cheating also cheated in their entirety). Likewise, this is a measure of the hypocrisy in the Croatian sample.

This inconsistency between attitude (value) and actual behaviour could be explained by cognitive dissonance or hypocrisy. Older researchers would argue that this produces cognitive dissonance (between attitude and actual behaviour). However, Coyne (2018) argues that two different world views (values) can coexist in the mind of the same person on the basis of hypocrisy e.g. obedience to an authority and not doing the right thing, being in a marriage whilst being an adulterer, being a priest whilst being a paedophile, believing in both the value of justice and the value of greed. In other words, two different value systems in one mind does not necessarily lead to cognitive dissonance, but simply hypocrisy.

This hypocrisy is apparently more prevalent in the Croatian sample. The cause of this hypocrisy, which is a long-term social problem, can be explained by the social rewards attributed to such behaviour. Although more research is required into this, this should be prevented in order to create a better society, better organisations and better human relationships. The results of the research are presented in Table 3.

Table 3: Negative, neutral and positive attitudes towards cheating and actual cheating behavior for both samples

	Slovakian sample	Croatian sample	Chi-square statistics, p-value, statistically significant difference
Negative attitude towards cheating ($M=3.50-5.00$)	34.4% (N=85)	51.3% (N=80)	Chi-square=10.00; $p=0.002$ (statistically significant difference $p<0.01$)
Neutral attitude towards cheating ($M=2.50-3.49$)	47.3% (N=114)	30.1% (N=47)	Chi-square=11.59; $p=0.0007$ (statistically significant difference $p<0.01$)
Positive attitude towards cheating ($M=1-2.49$)	17% (N=41)	18.6% (N=29)	Chi-square=0.16; $p=0.69$ (no statistically significant difference $p>0.05$)
Positive and neutral attitude towards cheating	64.3% (N=155)	48.7% (N=76)	Chi-square=0.46; $p=0.50$ (no statistically significant difference $p>0.05$)
Actual cheating behaviour	83.4% (N=201)	93% (N=145)	$h=7.71; p=0.0055$ (statistically significant difference $p<0.01$)
Hypocrisy=Cheating behaviour-Expected value of cheating behaviour (positive+neutral attitude towards cheating)	83.4%-64.3%=19.1% (N=16 hypocritical students)	93%-48.7%=44.3% (N=35 hypocritical students)	Chi-square=36.35; $p=0.00001$ (statistically significant difference $p<0.01$)

Source: Author's own compilation.

Although no statistically significant differences were found between the Slovakian and Croatian samples with regards to a positive (or combined positive and neutral) attitude towards cheating (statistically insignificant difference at $p<0.01$ level), there were interesting statistically significant differences found at $p<0.01$ level for:

- negative attitude towards cheating (statistically, more Croats have a negative attitude towards cheating than Slovaks). Such a finding can be explained by the fact that a greater number of Croats have internalised Catholic ethics/norms in their culture than Slovaks, whereby anti-moral/amoral attitudes are not socially appropriate. In other words, it is socially appropriate to say/write that it is not acceptable to cheat. This can also be said about behaviour.
- neutral attitude towards cheating (statistically, more Slovaks have a neutral attitude towards cheating than Croats). Such a finding can be explained by the fact that

Slovaks' attitudes towards cheating are more likely to depend on the situation. Sometimes it is acceptable to cheat, e.g. when a situation is unjust and there is no other way to accomplish a valuable higher goal, and sometimes it is not. In addition, within ethics (ethical ideology), there is a continuing discussion about whether ethics is situational or not. This therefore provides different views on the issue, e.g. idealism or relativism. In other words, is ethics absolute or reactive/situationally dependent? (Chudziska-Czupala, 2013).

- c) actual cheating behaviour (Croats cheat statistically significantly more, as explicated in research problem 1).
- d) hypocrisy between the Slovaks and Croats (Croats are more hypocritical). The measure of hypocrisy was obtained as the difference between actual cheating behaviour and having a positive or neutral attitude towards cheating. The expectation being that those students with positive and neutral attitudes towards cheating will occasionally cheat, whereas this was not the expectation for those who have a negative attitude. If someone has a negative attitude towards something, but secretly or occasionally does the opposite (saying one thing, but doing another), then this inconsistency leads to cognitive dissonance or hypocrisy. We suggest that the possible explanation lies in the significant number of students that behave in the opposite way to their attitude on the basis of the hypocrisy phenomenon. Hypocrisy is rarely punished. This implies that in political and everyday life in Croatia it is a "way of life". In Croatia, it is therefore socially appropriate to achieve one's goals by means of hypocrisy. Differences in culture between Slovakia and Croatia may also create such statistically significant differences through the hypocrisy variable.

In our sample, there were a vast number of students with a positive (Slovakian sample N=41; Croatian Sample N=29) and neutral attitude (Slovakian sample N=114; Croatian sample N=47 (with all of them cheating)) towards cheating. The lowest level of cheating was among those students with a negative attitude towards cheating (Slovakian sample N=85 x 19.1% = 16 hypocritical students; Croatian sample N=80 x 44.3% = 35 hypocritical students). Although it was thought that having a negative attitude towards cheating was the best predictor of actual cheating behaviour, as proven by the Slovak students (of the 85 students with a negative attitude towards cheating, only 16 cheated), this was not the case in the Croatian sample (of the 80 students with a negative attitude towards cheating, 35 cheated). In other words, having a negative attitude towards cheating is not such a good predictor of actual cheating behaviour. This is because of the presence of hypocrisy, which is statistically significantly more prevalent in the Croatian sample.

The third hypothesis assumed that those students with a positive and neutral attitude towards cheating would provide a good predictor of actual cheating behaviour. This was confirmed because some form of cheating was undertaken by all the students in both samples, making this an excellent predictor of cheating behaviour.

The second part of the third hypothesis assumed that having a negative attitude towards cheating would be a less good (bad) predictor of non-cheating behaviour. Indeed, having a negative attitude towards cheating resulted in more cheating than was theoretically expected in an ideal situation, i.e. a perfect match between a negative attitude towards cheating and no cheating taking place. A negative attitude towards cheating was therefore a poorer predictor of non-cheating behaviour in both samples. With this result, the third hypothesis was confirmed in full.

An additional finding was that having a negative attitude towards cheating is a better predictor of non-cheating behaviour among Slovak students (of the 85 students with a negative attitude towards cheating, only 16 cheated) than among Croat students (of the 80 students with a negative attitude towards cheating, 35 cheated). This result shows that having a negative attitude towards cheating among Croat students is not such a good

predictor of non-cheating behaviour. The possible explanation given is the hypocrisy phenomenon.

On the basis of this research it is possible to predict what could be expected from future employees (after finishing their management study) on the grounds of the data on their attitudes towards cheating and their actual cheating behaviour. An important point in confirming this statement is that in previous research (Graham, et al., 1994) it was found that cheating in exams in university settings is a predictor of future organisational behaviour, i.e. cheating has the potential to damage future organisational change and development. Because cheating in academic environments is widespread, which in turn has strong implications for organisational behaviour in future organisational settings, the results of this study imply that cheating in organisations can be predicted very well, particularly if positive and neutral attitudes abound. However, for practical reasons it is important to systematically lower the tolerance towards cheating. The theory of planned behaviour (Ajzen, 1991, 2006) provides a good theoretical framework for behavioural change. To lower the levels of cheating in academic settings, the following three points of action are suggested:

- a) Lower the level of tolerance of undesirable behaviour (cheating, hypocrisy). (Skýpalová et al., 2021) This aims to foster the internalisation of student values, i.e. cheating and hypocrisy (say one thing, but do another) is not appropriate and is dishonourable (shameful). Likewise, peers, professors and other stakeholders (family, important social groups, society as a whole) should strongly condemn such behaviour and take affirmative action against cheating/hypocrisy. Punishment/negative rewarding according to scientific psychological principles is also a very good strategy to apply (Čudina-Obradović, 1991).
- b) Technical/physical control and prevention of undesirable behaviour. This involves reducing the possibilities to cheat/be hypocritical. After all, opportunity creates a cheater (Šorgo, et al., 2015). Strict control during exams and of all the situational conditions where cheating can occur makes the behaviour difficult or even impossible and therefore rare.
- c) Encourage a change in attitude towards cheating / hypocritical behaviour. To change attitudes and prevent corruption in education, several systemic reforms are suggested, including reform of: ca) the educational structures; cb) the management and adjudication process; cc) the mechanisms for prevention and when wrongdoing occurs; cd) the system of sanctions (Heyneman, 2004; 2014).

Unfortunately, Ajzen's approach of planned behaviour requires long-term planning and implementation to be effective. The question therefore arises: What to do with existing students of masters programmes in business when they graduate with a degree from a university (some earned without cheating, some earned through cheating to a lesser or greater extent)? What proposals can be put forward from the OB/HRM point of view? Within this context, and within organisations, a number of preventive and reactive measures can be implemented to improve the quality of human resources coming from universities.

(i) *Preventive measures:*

- a) Improvement in HRM practices with regards to the way in which those who cheat are recruited. This can be achieved through the mediation of certain personality traits or ethical concerns. For example, during the recruitment and selection process, if a candidate shows a lack of concern for ethics, this may indicate a manipulative personality (Machiavellianism). Machiavellianism, as a personality trait, may stimulate cheating and unethical behaviour. It is therefore important to choose people without this trait. Bloodgood, Turnley and Mudrack (2008), on a sample of 230 business students from USA, found that following a course on business ethics did not have

a significant influence on students' views regarding cheating, but did result in students showing less Machiavellianism because of their more negative views of certain forms of cheating.

- b) Education on ethics/organisational culture and the promotion of spirituality management in organisational settings, i.e. organisational socialisation. Introducing servant leadership with the human values of truth, doing right, love, peace and non-violence promotes an ethical organisational culture. In such a culture, cheating, hypocrisy and corruption can to some extent be prevented.
- c) Communication. This is an important weapon with which to confront cheating, hypocrisy and corruption. Open, unambiguous and effective communication reduces the psychological space for the repetition of such inappropriate behaviours.

(ii) Reactive measures

- a) Punishment. This is the most effective tool. Strong punishment for immoral behaviour discourages others from doing the same (Čudina-Obradović, 1991).
- b) An effective system for coping with undesired behaviour that is difficult to diagnose (e.g. recognised hypocritical, manipulative, subtle anti-moral/amoral behaviours). By drawing up effective evidence-based protocols, it is easier to react in time and therefore reduce the psychological space for destructive behaviours.

6 Conclusion

Unfortunately, the research confirmed what was already known, that cheating among students of masters programmes in business at universities is commonplace. Of the Slovak and Croat business students that participated in the study, 83.4% and 93% respectively, engaged in some form of cheating behaviour. The high incidence rate draws us to conclude that such behaviour is influenced by attitudes towards cheating and is indicative of a culture that is tolerant of such behaviour.

This study showed that having a positive or negative attitude towards cheating are excellent predictors of cheating behaviour. For students who have such attitudes, it is possible to make the prediction that they will cheat when the opportunity presents itself. Although having a negative attitude towards cheating should have enabled us to predict non-cheating behaviour, this proved not to be the case. In other words, having a negative attitude can also result in cheating behaviour (more so by Croats (44.3%) than Slovaks (19.1%)). The mediation variable here is most probably hypocrisy.

The good thing about cheating behaviour from the scientific point of view is that by gauging attitudes towards cheating it is possible to predict actual behaviour, making it possible to implement preventive and reactive measures to control the unwanted behaviour.

The obtained results have strong implications for the reputations of universities, on the obtained competencies (cheating implies students do not have the required competencies), on long-term organisational behaviour (risk of corruption due to confirmed academic cheating over time) and human resource management (people with a positive attitude towards cheating or who are highly tolerant of cheating behaviour e.g. Machiavellians - people who say one thing, but do another - or hypocrites. Both present sophisticated problems for HR departments, especially for those involved in recruitment).

A good model for behavioural change – preventing cheating and hypocrisy, and the internalisation of a negative attitude towards cheating - in universities could be Ajzen's theory of planned behaviour. This would involve:

- a) lowering the level of tolerance of undesirable behaviour;
- b) technically/physically controlling and preventing undesirable behaviour;

- c) encourage a change in attitude towards cheating/hypocritical behaviour.

In organisational settings, the implementation of preventive and reactive measures could maximise the benefits from university graduate students coming into organisational settings or the business sector. Preventive measures include improving HRM practices, education on ethics and organisational, as well as better communication. Reactive measures include the punishment of undesired behaviour and the setting up of a system for coping with undesired behaviours that are difficult to diagnose.

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CRAFTS CREATIVITY AND ITS DEVELOPMENT FROM THE PRIMARY SCHOOL TEACHERS' PERSPECTIVE

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Abstract: Education in Czech Republic has recently undergone considerable changes. Emphasis is placed on the development of individuality, personality qualities, and competencies of pupils and students. Creativity has become an essential quality of modern man and it is proclaimed across many areas of human activity, being defined in various ways depending on the application of creative aspects. The area which we deal with in more detail in the article is creativity in technical education. In the context of current events in the field of educational policy in the Czech Republic, we present partial results of a research probe of a qualitative nature focused on identifying key elements of educational strategies of primary school teachers in the implementation of creative technical activities at primary school.

Keywords: education, crafts, creativity, primary school, teachers, teacher education.

1 Crafts and technical creativity in the context of contemporary challenges

At present, creativity is considered one of the essential abilities of the 21st-century person. Hence the emphasis is attributed to it in key documents and educational strategies. Schools and teachers are facing the challenging task of preparing pupils for situations not encountered before, for jobs not yet existing, for solving problems not yet perceived as problems, for working with technologies not yet invented (Samandari, 2011). Difficult as the task may seem, its accomplishment is sustained by new ideas and approaches which are entering education, thus transforming it gradually. In addition to key competencies, emphasis is placed primarily on creativity, which is inflected across educational areas and expected outcomes. (NÚV, 2017)

In general, the development of technical skill, creativity, and thinking is, to a certain extent and in various forms, an integral part of the initial education of most countries in the world. However, the specific form in terms of content, scope and methodology of the latter always reflects the geographical conditions, individual and social needs, current opportunities, and, last but not least, promising challenges. Therefore, significant differences might occur in particular research papers. These are reflected in the level of procedures, tools, materials used, as well as in the sense of implementing such focused teaching. In some cases, differentiation appears in the degree of the proportion of skillfulness and technical thinking development between individual schools within one country. For example, in the Czech Republic, while certain schools place more emphasis on the development of manual skills, others tend to focus on cognitive development, that is to say, the formation of technical thinking of pupils.

2 Research investigation

Based on the above theoretical background and current needs of educational practice, a research survey was conducted, the aim of which was to identify key elements of educational strategies of primary school teachers in the implementation of creative craft/technical activities at primary school. Since we strived to capture a more holistic view and identify the interrelationships, we focused directly on primary school teachers and their internal view of the topic. Our main goal was to understand how teachers themselves approach the implementation of technically creative activities. The partial goal was to identify key situations which appear in their implementation of teaching creative technical subjects and to define partial problems in various stages of the teaching process. Last but not least, there was an effort to characterize teaching strategies applied by teachers in the implementation of this type of activity.

A self-reflective questionnaire was applied as a research tool, which was compiled from open-ended questions so as to enable completely free answers from the respondents. The individual items in the questionnaire represented the expected primary categorization of the data obtained. The questionnaire was then processed using a qualitative analysis of the text, so-called "analytic induction" (Savign-Baden, 2013, p. 422) based on "grounded theory" (Strauss, Corbin, 2014). This methodological approach was chosen in an effort to map the research area not based on existing theory, but in order to create a new theory.

The research problem of the presented empirical research is the choice of teaching strategies of primary school teachers in the implementation of technically creative activities. With respect to current changes in the field of educational policy, the research is focused on primary school teachers as drivers of change and the main factor influencing the successful implementation of curricular innovations. Particular educational procedures and the overall approach to teaching are shaped not only by professional competencies but above all by personal qualities, experiences and opinions.

3 Research goals, questions and characteristics of respondents

The main goal of the research is to carry out research aimed at identifying teaching strategies of primary school teachers in subjects of a creatively technical nature.

- (Q1) How does a teacher prepare for the implementation of creative technical subjects?
(Q2) How is teaching creative technical subjects implemented?
(Q3) How is the final reflective-evaluation phase of teaching creative technical subjects conducted?

Teachers were selected by means of a survey carried out all over the Czech Republic, and the contact with the teachers was conducted both in the form of personal meetings and online. A total of 55 primary school teachers were involved in the research. Respondents worked at various types of schools in terms of organization and location (fully organized urban schools, fully organized village schools, schools with more grades in one class were represented).

The group of respondents consisted exclusively of women¹ with different lengths of practice, and of different age categories. The most represented group consisted of teachers aged 35-50 with 4-15 years of experience and teachers with pedagogical experience of 16 and more years. The least represented group was teachers with experience of up to 4 years.

4 Data analysis strategy

In conformity with the research goals, content analysis was chosen, which allows performing a systematic and comprehensive summary of the obtained data and is based primarily on the study of recurring specific phenomena. The following sequence was followed during the processing of the obtained data:

- segmentation and coding;
- creating categories;
- identification of relationships between categories;
- creating structures and stories;
- interpretation of investigated data.

In the first phase, open coding was used to thematically reveal the analysed text, followed by primary categorization based on Vivo codes. Parallely with open coding, annotations were applied (Miles, Huberman, 1994), which allowed to move from the level of empirical data to the conceptual level, and thus further develop the codes into subcategories, including the representation of their relationships, and head towards a

comprehensive understanding of phenomena, processes and interactions. The qualitative analysis thus conceived enabled not only the identification of key phenomena but, more importantly, the qualitative interpretation, including the introduction into a broader context, of the latter. Furthermore, selective coding was used to identify key categories. (Juklová In Skutil, 2011, Hlad'os, 2013)

5 Research survey results

The analysis of data obtained through self-reflective questionnaires is structured into four primary categories, three of which represent individual phases of the teaching process (Preparation and planning of teaching, Course of teaching implementation, Conclusion and evaluation of teaching). The last category covers "other" phenomena, that is to say specific statements of the respondents, which refer to the personal experiences, preferences and knowledge of the latter, often permeating the content of all previous categories. Based on selective coding, an internal subdivision was created within the key categories. The subcategories of Teacher's preparation, Pupils' motivation, Pupils' preparation for the teaching, Anticipated teaching methods and Others were also included in the category Preparation and planning. Within the Course of teaching implementation category, a total of six subcategories were singled out, namely Preparatory phase of the lesson, Teaching methods and organizational forms, Pupils' personality development, Pupils' reactions and Others. The last category, Conclusion and evaluation of teaching, covers following internal subcategories: Product-oriented assessment, Process-oriented assessment, Assessment Pupils' personal qualities oriented assessment and General matters (see Table 1).

Table n. 1: Categorization of content analysis data

Teacher's preparation and planning	Pupils' motivation Pupils' preparation Anticipated teaching methods Others
Course of teaching implementation	Preparatory phase of the lesson Teaching methods and organizational forms Pupils' personality development Pupils' reactions Others
Conclusion and evaluation of teaching	Product oriented assessment Process oriented assessment Pupils' personal qualities oriented assessment General matters

As emerged from the analysis, the perception by teachers of the subject Work activities was rather narrow. Teachers solely mentioned learning situations focused on making a product, while other activities, which can be included in the teaching of Practical Activities, such as trials and experiments, activities aimed at acquiring theoretical knowledge (work with resources, worksheets, and so on), activities aimed at solving technical problems (group or individual solutions of specific situations, that is to say, activities not resulting in product creation), were not represented.

Within *Teacher's Preparation and Planning* category, the efforts of teachers to create ideal conditions for pupils' work were significant. According to the answers obtained, thorough preparation of the teacher is of capital importance, including the pre-making of a product, often in several variants, to give pupils a comprehensive idea of the final product, that is to say, a thing which pupils produce or an idea which they discover. Furthermore, the preparatory activities of teachers comprise considerations about other possible modifications of the final product with respect to the possibilities and limits of pupils in the group. Usually, pupils are offered both the basic variant of a product and its simpler and more complex modifications. A simpler variant of the product is often intended especially for pupils with special educational needs. For gifted students,

teachers prepare ideas for independent work should the former complete particular tasks earlier than most other pupils in their class.

The comprehensive provision of all necessary aids, tools, implements and materials by the teacher is almost standard. The preparation being entirely under the direction of the teacher is justified mainly by the young age of the pupils. Respondents state that insufficient preparation by the teacher often leads to the disorientation of the pupils confronted with the learning situation, their inability to flexibly adapt to the conditions and/or solve the problem independently. Consequently, the planned educational goals are not achieved, which is most obvious with pupils requiring a specific approach whose reaction is particularly intense.

An often mentioned part of teacher preparation is the visualization of the individual steps of the solution process, which serves as a basis for pupils' activities following the initial instruction of the teacher.

Motivation is an integral part of teaching is a natural part of the teacher's preparatory considerations and activities. According to the respondents, the nature of practical activities is in itself a great motivator for pupils, and especially in the lower grades, the creation is a natural motivational activity of pupils. Nevertheless, motivation is a crucial factor influencing teacher's preparation. A strong motivating factor when choosing the activity is the theme of the product as well as the tools and materials used, which can make the planned activity more attractive (cf. Částková, Dostál, Kropáč, Janu, 2019). Respondents stated the importance of taking into consideration the gender specifics of pupils with regard to their interests and preferences, which is why teachers allow pupils to choose from more than one topic. The strongest motivating factor is the usefulness of the planned product, especially its applicability in the lives of pupils or their loved ones. Recurring events in a person's, school's or pupil's life become a natural motivation. In accordance with the interdisciplinary concept of primary education, the phenological approach is applied across subjects. Pupils' activities are thus thematically focused mainly on activities and events during the year. Moreover, depending on the locality of the respondents' school, regional differences are also partially manifested in the choice of topics, products and the nature of the activities.

Another specific subcategory resulting from the *Vivo* codes is *Preparation of pupils before teaching*, demonstrating the teachers' effort to at least partially involve students in the preparation for teaching. Following exact instructions given by the teacher, pupils participate in the preparation of the workplace, aids and materials before the start of teaching itself. One of the possible variants of pupils' involvement mentioned by respondents is a symbolic visualization of key steps in the work process. This group activity leads to the activation of pupils and, through the symbolic marking into the pupil's speech, makes it possible for pupils to understand partial technological principles. The aforementioned steps subsequently increase the pupils' independence, active participation of the pupils in the educational process, and the gradual acquisition of co-responsibility for learning outcomes by the pupils. All the above mentioned are supported by the efforts of teachers to integrate modern teaching aids and the use of ICT as a tool for the individualization of pupils' activities.

With the increasing age of students, gradual development of independence in thinking, problem-solving and action is evident. Accidentally created as well as subsequently intentionally created problematic situations of a technical nature, the solution of which becomes pupils' task, become a useful tool. According to the respondents, the general perception of the subject as relaxing and complementary, both by pupils and teachers, is problematic. In teaching practice, the subject is often replaced by "more necessary" lessons representing the so-called mainstream of education. Furthermore, it is possible to note the tendency to simplify activities so as to eliminate the characteristic elements of technically oriented objects. These

include, for example, the complexity of teacher's preparation, the need to comply with basic hygiene and safety principles, requirements for material and technical equipment, and so on.

Another primary category, the *Course of teaching*, is singled out from the area of *Preparatory phase of the lesson*. The preparatory phase shall be given sufficient room, especially during pupils' independent work. As far as the motivation of pupils is concerned, collective analysis of the work process, explanation of individual steps, and discussion of necessary aids and materials are considered as crucial. In the discussion phase, students are guided to develop technical thinking, creativity and imagination by proposing possible workflow options. Certain respondents emphasize providing pupils with space for the application of their ideas and the development of their creativity. Creativity and self-invention of the pupils are enhanced by the offer of various topics, the choice of several product variants or a less specific description of the final product. However, on that point, there are discrepancies between particular statements, as partly free creation is limited by the requirement of the teachers for disciplined activities of a frontal nature, which should lead to a uniform product and eliminate the occurrence of possible errors in the work process.

Within the *Teaching methods and organizational forms* subcategory, respondents preferred group work with an emphasis on mutual learning, development of cooperation and other social skills of students. When working individually, pupils use a shared work environment, which enables them to create independently and yet together. As it was unanimously claimed by the respondents, the implementation of group work is conditioned by the formation of groups influenced by the teacher in such a way to pupils of different levels be naturally incorporated and thus heterogeneous groups be created. As regards creative technical activities, respondents prefer smaller groups of pupils (max. 4 pupils). Pupils' group work is described as more attractive for the latter, but at the same time very demanding. A different approach is applied by the teachers questioned with respect to the preferred teaching time allowance, as some respondents prefer 45-minute lessons, while others often use the possibility of connecting lessons and allow students to work in blocks.

As far as the area of *Pupil's development* is concerned, the respondents showed considerable criticism of the abilities of an affective nature as well as of the level of practical skills. Teachers try to take into consideration the different learning styles of pupils, which are reflected both like activities and in working with materials and aids. Respondents state a double typology of pupils, where some pupils appreciate working according to the exact model and without much influence of their invention, while other pupils prefer freehand creation. The analysed data show that working according to the assignment is very problematic. Furthermore, the inability of pupils to focus on the task is stated as the most significant obstacle to activities of a creative technical nature and at the same time as a cause of numerous accidents by the respondents.

An integral part of each lesson is the final phase, usually incorporating a summary of the lesson and feedback from pupils. However, this phase is often partially or completely absent in technical subjects' lessons, which is often mentioned as a shortcoming by the respondents. The reasons for this absence are numerous, among others, they are an inappropriate choice and layout of creative activities with respect to the level of pupils' skills and/or necessary cleaning of the premises. Providing feedback to pupils is often realized at a long time interval or only marginally in class. Another frequently mentioned topic was classification. Some respondents tended to deviate from the usual classification, mainly due to insufficient coverage of the latter of broader aspects of activities implemented. According to some teachers, technically creative activities should have a relaxing and motivating character and develop personality traits of pupils, the evaluation of which by classical school classification is not considered as adequate. Therefore, teachers often resort to motivational classification. According to the

analysed data, teachers often focus on the final product in their classification as a necessary summative assessment, while broader aspects such as the course of the pupil's work, work commitment, production process, creativity and others are only evaluated verbally. As one of the solutions, frequently used by the respondents, the latter stated pupil's self-assessment, covering specific internal creative processes of the pupil and the specifics of assessment of creative technical activities. Depending on the pupils' age, self-assessment is implemented using symbols, points and/or simpler assessment statements, for example in a community circle, the main purpose of these being the development of the pupil's affective components. Negative feedback from a teacher to a younger school-age pupil is perceived in the statements as inadequate and uneducational. Typically technical categories such as the appearance and functionality of a product do not play such an important role in teacher's evaluation but are rather referred to as marginal criteria. On the contrary, the key evaluation criteria are the pupil's effort and participation in activities as the basic goal of feedback from the teacher is to motivate pupils and encourage further creative activity.

Table n. 2: Summary of data obtained by research within individual categories

Categorization	Partial categorization	Data summary
Preparation and planning of teaching	Teacher's preparation	Efforts to create ideal conditions for pupils' independent work. Offer of product modifications according to the degree of difficulty - link to students' self-assessment. Preparation of a simple workflow for pupils.
	Pupils' motivation	Clear need of taking into account gender specifics in the planning and preparation of activities. Usefulness and applicability of products as the main factor of motivation. Obvious effort to make activities more attractive - aids, resources, and so on. Natural motivation resulting from current events in the lives of pupils.
	Pupils' preparation before teaching	Involvement of pupils in preparation before the actual start of teaching. Symbolic visualization of partial steps - development of technical thinking.
	Anticipated teaching methods	The gradual development of pupils' independence in logical and technical thinking through solving problem tasks (randomly created and prepared in advance).
	Others	Perception of the subject as relaxing by both pupils and teachers. Clear tendency to simplify activities to make them less demanding for teacher preparation.
Course of teaching	The preparatory phase of the lesson	Sufficient time devoted to demonstration and explanation of the workflow leads to more efficient work and course of teaching. Involvement of students in the visualization (plan) of individual steps of the production process. Error as negative vs. error as a "lesson".
	Teaching methods and organizational forms	Space for the development of pupils' creativity. Mutual inspiration is also within the individual activities of pupils.

		Appropriate choice of group composition by the teacher (number, characteristics). Simple and fast products vs. larger-scale activities.
	Pupil's personality development	Communication and cooperation is a key part of teaching.
	Pupils' reactions	Group work is more demanding for pupils, however, more attractive. Problematic concentration at work. Problematic overcoming of obstacles and solving partial problems. Pupils' limits with respect to creative expressions.
	Others	Insufficient development of pupils' independence.
Conclusion and evaluation of teaching	Product-oriented assessment	Summative assessment of the product as a necessary formal part of teaching.
	Process-oriented assessment	Positive experiences of the pupil as the main goal of teaching.
	Pupils' personal qualities oriented assessment	Neither the skill nor the skill level of the pupils is assessed. Pupil's interest, activity.
	General matters	Failure to take into account the specifics of technical education in assessment. Pupils' self-assessment as an adequate way of assessment. Elimination of negative feedback.
Others		Motor skills are more important than creativity.

6 Discussion and summary

In an effort to develop a more comprehensive view of the implementation of practical activities at primary school and the identification of individual approaches of teachers, a research tool enabling the provision of sufficient space for free expression of views, outline of specific conditions at school and teacher-student relationship was selected. As respondents spoke openly about their more or less successful strategies and partial decisions, a systematic analysis of the issue was possible.

Despite the fact that the questions were focused more generally on the subject, the statements of the respondents showed a rather narrow perception of the content, as only statements about pupils' activities leading to product creation appeared. Other activities related to the content were completely neglected, such as the development of a theoretical basis, experimental and experimental activities leading to the knowledge of the properties of materials, and/or the solution of problematic situations of a technical nature. There can be several reasons for this phenomenon. Firstly, due to the specifics of primary school pupils, the predominant effort of teachers is to develop primarily the skill side of the pupil, which generally has a declining tendency in society. Secondly, understanding the subject as relaxing and compensatory in relation to cognitively oriented activities might be perceived as one of the causes. This perception, although in accordance with the theoretical definition of the functions of the subject, can also have a negative effect, though. The content offered to pupils should not neglect the knowledge base which underpins creative activities, as knowledge and teaching about technology are a key part of educational goals in the field of technology education at primary school (see eg Kropáč and Chráska, 2004; Kožuchová, 2008; Friedmann, 1993; Honzík, 2015; Částečková, 2018). The question still stands whether teachers do not classify technical knowledge intentionally or whether they pass the assessment on

to pupils during the creative work of the latter, always in relation to the product they are working on.

In the following section, we shall try to summarize the answers to the research questions, according to which we shall further structure the text.

(Q1) How does a teacher prepare for the implementation of creative technical subjects?

Teachers' preparation to develop pupils' technical thinking and skills is challenging in many ways. Leaving aside the economic demands on materials and aids, the spatial background is also a big topic. Workshops and classrooms designed for technical work are usually adapted for older school-age children and primary school children, therefore, cannot work safely with the particular work desks, tools, instruments and aids. Consequently, practical activities are reduced to the most elementary subject matters by the teachers, covering only a limited range of possible activities.

The preparation of technical material and aids, which are used at lower primary schools, is predominantly the teacher's responsibility in the cases investigated, which we do not consider optimal. According to the respondents, the pupils participate to a very limited extent, which mainly stems from the set system of cooperation and communication between the parent and the teacher. Insufficient participation of the pupil in the preparation of lessons was also one of the frequently appearing topics. Pupils' actions were described as non-independent. As a result, pupils do not share responsibility for the results of their learning and it is very difficult for them to solve naturally occurring issues.

(Q2) What is the implementation of teaching creative technology subjects like?

The approach of teachers to the choice of teaching methods and work procedures can also be described as contradictory. In the research sample, it is possible to identify two partial approaches, namely receptive and creative. In the research, we identified the tendency of teachers to be monotonous with respect to the requirements for the final product of the pupil. Any deviation from the "teacher's idea" and strict adherence to the work procedure was perceived negatively. Such a directive way of assigning tasks to pupils significantly eliminates the space for the development of the pupil's personality features, the so-called soft skills. However, in contrast to the described receptive procedure, an effort to develop the pupil by providing freedom of creation group was identified with a group of teachers. Such teaching aims to provide opportunities to use one's own invention, either in the process of work or in its final solution. As free creation is especially demanding for pupils who have no experience with it, demands for a change of the approach to teaching are placed on teachers. The actual activity shall be preceded by a discussion of the topic and the setting up of a creative and inspiring safe atmosphere. As not all pupils prefer this way of learning, it is necessary to approach pupils individually and to choose from various more or less defined activities and topics. Capturing creativity in technology is also problematic. Different subjects presuppose the development of different types of creative thinking. The differences between creativity in art (ART) and creativity in technology (STEM) are significant. (Broekhoven et al, 2020) Technical creativity is a specific type of creativity realized in a large area called "technology". This can be both at the level of technical practice and at the level of technical theory. The connection between these two levels depends mainly on the level of knowledge and skills of the pupil, that is to say on the level and type of school education.

As follows from the data analysis, creative activities at primary school in the first years of schooling are focused on the acquisition of basic skills and the development of motor skills, rather than on the development of pupils' creativity. Only pupils in higher grades are provided space for the development of

technical creativity. (Duffy, 2006) However, the findings of developmental psychology point to the need to acquire certain thought mechanisms leading to creative activity. (Hennessey, Amabile, 2010) By the time teachers focus their activities on developing students' creativity, these mechanisms are already partially in place, including limits and barriers. In addition, the pupil in this developmental period is already significantly influenced by the tendency to conventional behaviour and actions detrimental to creative activity. (Dacey, Lennon, Fiore, 2000) Moreover, no connection between creativity and the level of psychomotor skills of pupils has been proven. (Honzíková, Sojková, 2014) For the above reasons, it is necessary to include the activities for the development of pupils' creativity as soon as in the pre-creative stage of the child (preschool age) and further systematically develop them in teaching at lower and higher primary school. A key question is whether teachers view the issue of creativity in accordance with the theoretical basis and, if so, how they reflect the need to develop student's creativity in the preparation and implementation of teaching.

(Q3) How is the final reflective-evaluative phase of creative technology subjects teaching implemented?

In many aspects, the assessment in technology education is a more complex issue than assessment in cognitively oriented subjects. (Liebchen, 2003; Hanschke, 1992) Due to the fact that the description of a pupil's creative technology activities is mainly related to the terms activity, action, behaviour and conduct, the five-level classification scale as a dominant method of evaluation in the Czech Republic proved to be insufficient. The classification often reflects only the final "impression" representing the summative evaluation of the teacher. The teacher's approach mirrors the overall philosophy of the school, including evaluation. A different way of assessing pupils for subjects with the predominance of cognitive load and for subjects with a predominance of educational activity might be set out in school curriculums. Overall, the nature of the feedback provided by the teacher should be shaped primarily by the effort to create a positive relationship to practical activities. A partial goal should then be the formation of the pupil by their involvement in the assessment through the induction of self-assessment activities by the teacher. (Cowie, 2005) The subject of teacher evaluation can be the pupil's product, the course of the pupil's activity and broader aspects including an individual approach to the activity. In the statements of the respondents, evaluations focused on the result of the pupil's activity appeared most often, followed by evaluations focused on the course of the pupil's activity and quality. Although the evaluation criteria were set through a demonstration of the expected product, these criteria no longer appear when describing the final evaluation phase of the lesson. The question is whether and how the criteria are perceived by the pupil in case they are not specified by the teacher before the start of the activity.

As the analysis of the obtained data showed, the evaluation is carried out by teachers rather unsystematically, intuitively, without setting formal criteria which would allow monitoring the individual progress of pupils, which is naturally perceived by teachers, however, often not sufficiently communicated to pupils. The so-called "technical criteria", namely the workflow planning process (imaginativeness of the design, sketch, design of production process and its record or sketch, choice of materials and so on.), production process (knowledge of terminology, adherence to work procedure, work technique, level of motor skills (shifts and changes), movement and work skills, quality of operation, occurrence of errors in handling activities, choice of tools, material management and energy, work organization, compliance with the principles of occupational safety and health, workplace organization, ability to work independently and creatively) and the product assessment process (product functionality, work accuracy, absence of failures to meet the time required to perform the specified work, originality, and so on) are not systematically applied by teachers during the evaluation of pupils (Hohlhoch, 2001; Honzíková, Sojková, 2016).

7 Conclusion

Since the beginning of the 21st century, the development of creativity has come to the forefront in education. Taking into account the dynamically changing conditions in society as they have manifested themselves in the last two years, this component becomes even more important. It is also reflected in the preparation of legislative and curricular changes through a major revision of the framework educational programs, the new version of which should come into force in 2023. In connection to this, we are currently intensively involved in preparing a completely new concept of education called Man and Technology. The article presents the intended topics and the expected learning outcomes on the pupil's side, formulated on the basis of research into the needs of pedagogical practice.

The qualitative nature of the research survey made it possible to analyse the real course of teaching practical activities from the teacher's point of view and identify important learning situations, key points of their preparation and possible solutions to naturally occurring problems in the form of examples of best practice. Teachers' views, attitudes, opinions and applied educational strategies were influenced by many variables. As the research sample consisted of teachers of different age categories, with different lengths of practice and different school backgrounds, a view of the issue from several levels was revealed. A partial goal of the research survey was an effort to characterize the educational strategies of teachers applied in the implementation of this type of activity. The framework of educational strategies consists of individual phases of teaching, the characteristics of which will form the basis for further research activities of the authors.

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Primary Paper Section: A

Secondary Paper Section: AM

SOCIAL INTEGRATION OF YOUNG ADULTS LEAVING INSTITUTIONAL CARE: PERSONAL EXPERIENCES

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This article is an output of the internal research project IGSO 7/2022 entitled "Uplatnění mladých dospělých opouštějících dětský domov na současném trhu práce" ("Employment of young adults leaving children's home in the current labour market") carried out in 2022 and 2023. The project was financed from a subsidy for the long-term conceptual development of a research organization provided to Jan Amos Komenský University Prague by the Ministry of Education, Youth and Sports.

Abstract: The beginning of an independent life is a challenging time for every young person. Some, however, struggle at the beginning difficult because of release from an institutional environment. The main aim of the paper is to find out to what extent they are able to adapt to the conditions of contemporary society. To achieve the goals, we used a qualitative research design based on intensive contact with the investigated environment. Data obtained from interviews, observations and pedagogical documentation were processed using grounded theory, interpretative phenomenological analysis and narrative analysis. The results obtained confirm the fact that young individuals leaving institutional care facilities are at risk of social exclusion and the possible emergence of negative patterns of behaviour. Respondents identify the lack of follow-up support as a significant problem. The outputs of our research offer incentives for the modification of special pedagogical work in children's homes, especially when preparing young adults for their transition period.

Keywords: *children's home, institutional care, follow-up support, social exclusion*

1 Introduction

Embarking on an independent life is an important milestone for all young people. They leave the security of their families and have to face the realities of our society. It is a challenging period that puts many challenges and obstacles in their way. For some young adults, however, the situation is much more complex. Every year, several hundred young adults leave institutional care. They either return to their original families or try to manage the transition to independence on their own. The main aim of this paper is to offer an insight into the reality of young individuals leaving the residential care facility of the Children's Home Klánovice. We will explore the extent to which these young people are able to adapt to the conditions of contemporary society. We will divide the paper into two parts. First, we will describe the research design, the research setting, and the target group. In the second part, we will present the results of the research and in the discussion, we will offer modifications to the educational process that could positively influence the process of resocialisation of young adults after leaving institutional care.

2 Methods

We are working with a qualitative research design that has proven successful in previous research (Daněk, 2022). Qualitative research design can make a significant contribution to the modern inclusive paradigm (Lindsay, 2003; Willig, 2017). Initial data collection is conducted using semi-structured interviews and participant observation. The interview is the most commonly used method of data collection in qualitative research (Švabiček and Šedřová, 2014, p. 159). Currently, we can also observe a change in the researcher's perception of the interview process. Schulman (2009, p.139) believes that it is necessary to allow the researcher to reconcile the personal component with the professional position.

The author works in the researched setting as an educator and risk behaviour prevention methodologist. We believe that a passive researcher would obtain less reliable results than a researcher actively involved in the researched environment (Charmaz, 2006, p.5). As qualitative researchers, we are involved in intensive contact with the researched group (Creswell, 2009, p.270). Due to the involvement of the researcher, we can spend a massive amount of time in the research setting (Toušek, 2015, p.11). Furthermore, it also removes the distrust of respondents that we can sometimes

encounter when the research setting is a very closed community, which the children's home undoubtedly is. We record and then process the information gathered from interviews and observations using a combination of grounded theory and interpretive phenomenological analysis. These research methods are described by experts as highly appropriate for settings similar to ours. Our design allows us to interpret "lived experience" (Alase, 2017, p.13).

A key requirement of the research is the objectivity of the results. In the case of a qualitative design involving the researcher's presence there is a risk that the results could be biased precisely by too much contact with the environment under study. For this reason, we place considerable emphasis on research objectivity, using the principle of triangulation as a tool. Triangulation is a research method in which we subject our findings to the critical perspective of other research methods or other researchers (Flick, 2009, p. 444). We strive for the richest range of research methods themselves. We support interviews with observations, and we confront partial results from the outcomes of the analysis of pedagogical documentation. Comparing our results with the views of other researchers, and above all with those of the professional community, has proved to be the most effective tool of triangulation. The most recent sub-triangulation took place at the national conference of the Federation of Children's Homes. We presented the results of our research to representatives of 28 children's homes and invited them to approve or comment on our findings. We recorded overwhelming approval. Based on this experience, we can therefore state that the results of our qualitative research represent the educational reality of a significant number of children's homes in the Czech Republic.

3 Researched environment

We researched the school facility for the performance of institutional care, the Children's Home Klánovice. One of the pedagogical and educational priorities of the Children's Home Klánovice is to prepare children and young adults for the moment when they leave the children's home and start their independent lives. For young adults who have reached the age of majority, training studios are available on the premises of the Children's Home. Ten of these are currently available, and young adults are able to have the opportunity to live independently without the constant supervision of teaching staff. The Children's Home Klánovice also manages four starter flats, which young adults can use after leaving the Children's Home. The target group of our research was young adults who use this training and starter accommodation. These included seven respondents. All of them came to the Children's Home Klánovice from pathological backgrounds. In their original families, they have experienced alcoholism, substance abuse, and a large number of respondents have experienced domestic violence. The negative influence of the original families on the respondents was long-term, all other forms of intervention failed. Therefore, institutional education was also mandated. Based on our research, we can argue that the original family is the main factor directly responsible for most of the problems that the child and young adult encounter during their stay in the children's home. The most significant difficulties are observed in the area of educational and social competencies, and recently, the number of children and young adults with psychiatric diagnoses has increased. We observe a low aspirational level, difficulties with long-term planning, and the observed children's and young adults' expectations about life in today's society are not realistic. The youngest respondent of our research was 18 years old, and the oldest was 25 years old. There were seven young adults in the study sample, four females and three males. Three respondents had already left home, while the other four were planning to leave in the near future.

We conducted the interviews and observations in the natural environment of the respondents. Contact with young adults who had already left the Children's Home Klánovice was made by telephone or through social networks. The research activities have been taking place in the Children's Home Klánovice since 2014. Because of our involvement in the research setting, we could spend a considerable amount of time with the respondents. We also spoke with the teaching staff of the Children's Home Klánovice. In particular, we investigated whether the preparation for leaving the institution is sufficient and what support options are available for young adults after they leave the institution. With respondents who had already left the Children's Home Klánovice, we extended the scope of the questions to the area of reflection on their expectations and contact with the reality of independent life.

4 Significant findings

Several interesting findings have emerged from our research. Educational staff rated the level of preparation of the young adult for leaving the children's home as sufficient. In their words, preparation for leaving the children's home starts several years before the actual departure. The most important areas identified by the educational staff were supporting young adults in achieving the highest possible education, optimising the educational process, supporting the young adult to build up work competencies and, last but not least, an emphasis on financial literacy. Educational staff positively rated the involvement of the non-profit sector. In the conversations, there was a demand for cooperation with child social protection authorities, which, according to the educators, was insufficient in terms of preparation for the departure of young adults. Educational staff also pointed to the low interest of young adults in being actively involved in the process of preparing for their departure.

While the young adults were aware of the fact that they would leave the institutionalised care, they did not have a clear idea of their future in mainstream society. The young adults positively evaluated the efforts of the educators to prepare them for their departure. But in their words, it was not among the priorities of the educational process of the children's home. Rather, the young adults focused on staying in the educational process, which allows them to remain in the children's home. The young adults took part in the activities of the non-profit organisations that cooperate with the Children's Home Klánovice, but in their words, they did not see the potential for their future life. Respondents clearly articulated their reluctance to take part in such activities several times. This was clear when observing the involvement of young adults in events in the non-profit sector, where we did not observe an effort by young adults to engage in discussion, and passive expectation of the event by the organisers prevailed.

It cannot be argued that children and young people are educationally and socially behind solely because of institutionalisation. According to our findings, children come to the children's home with pre-existing difficulties. The narrative analysis helped us to penetrate the period of development of children and young adults before their arrival at the Children's Home Klánovice. It was clearly shown that a significantly important period preceded the stay in the children's home when the child was exposed to pathological influences of dysfunctional family environments and the efforts for rehabilitation by the authorities of social and legal protection of children were not successful. The issue of the original families proved to be crucial. It is the family of origin that can be a source of stress rather than support (Häggman-Laitila, 2018, p. 139). However, none of the respondents had distanced themselves from their family of origin, and rationalising excuses were regularly heard by young adults to explain their parents' actions. In interviews, respondents who had already left the Klánovice Children's Home confirmed our assumption that at the moment problems rose that they were no longer able to cope with, they tried to seek help from their original families. However, none of the interviewees received the necessary support from their families.

That the original families failed did not surprise us. In our analysis of educational records, we did not find a single case of an original family that had the capacity to provide support for a young adult. We noted repeated instances in the past where the own family had quite openly taken advantage of the young adult, depriving them of all finances and personal possessions. They subsequently discarded him or her, leading to a return to the children's home. It was alarming to find that young adults did not have enough support from the state after leaving the children's home. There were repeated statements that after leaving the children's home, all support activities were discontinued and the young adults found themselves completely on their own in the reality of contemporary society. It is a sad truth that currently there is no comprehensive system for young people leaving institutional care in the Czech Republic, financially supported and professionally guaranteed by the state (Běhounková et al., 2012, p. 166). Individual services do not operate under a single platform, and demand far exceeds supply. Respondents clearly stated their concerns that the necessary aftercare is not available in the current society to support them in the process of adaptation to an intact society. Respondents who had already left the Children's Home Klánovice confirmed these concerns. According to them, the reality of current society does not consider the fact that they have spent a significant part of their lives in institutional care. All respondents had experienced a sharp decline in their standard of living after leaving the children's home. It should be stressed that falling into poverty is associated with a number of negative concomitant phenomena, such as a loss of self-esteem, the possibility of risky behaviour and the reinforcement of the feeling that the individual living in poverty has been completely rejected by society (Bray et al., 2020, p. 4). Another negative phenomenon associated with the financial situation of young adults is foreclosure. Respondents reported that after leaving the orphanage, they found themselves in situations where they were forced to address their financial affairs with a loan or were unable to meet their financial obligations.

5 Conclusion and recommendations for practice

In our research, we aimed to explore the reality of young adults leaving institutional settings and to map their possibilities of adaptability in today's modern society. The goal was achieved, but our conclusions are not optimistic. We are aware of the fact that our outcomes cannot be universal because children's homes are not identical. At the same time, these settings do not always have the same effect on young adults themselves (Van Ijzendoorn et al., 2011, p. 25). However, there is no disputing the fact that young adults leaving through the gates of children's homes are at greater risk of social exclusion compared to their peers. In intact families, young adults leave for mainstream life later (Stein, 2006, p. 274) and, moreover, can turn to their families for help when needed. Young adults from children's homes have their start in independent life determined by law and their original families are usually unable to offer them help. Moreover, they often do not accept that they will be on their own when they leave the children's home. Hence the frequent displacement and rejection of the reality of the situation and the unwillingness of young adults to actively prepare for leaving the children's home.

Although educational staff described the preparation for the young adults' departure as sufficient, we would beg to differ. Our findings suggest that this is not a systematic and auditable process. The solution could be an amendment to the current legislation, where the obligation to prepare for leaving the institution from the very beginning of the stay would be anchored. There is currently a legislative debate on the need to modernise the legislative instruments of social protection (Stárek, 2020, p. 76). Given the interdisciplinary nature of the issue of institutional education, it would certainly be beneficial if preparation for leaving children's homes were a legal obligation of the child social protection authorities. The cooperation between the social welfare authorities and young adults should continue even after leaving the children's home. Interdisciplinary teams should be established so experts from

different disciplines may work together (Little et al., 2008, p.207).

Young people leaving children's homes need comprehensive support. It should be strongly pointed out that, compared to their peers, they have considerably more difficult starting conditions at the beginning of their independent life. If they fail to get off to a good start, the risk of them turning to negative behaviour patterns such as drugs, alcohol and crime increases significantly. Children and young adults in children's homes are at risk of substance abuse, which is also a serious problem for young adults leaving institutional settings (Csiernik et al., 2017). The current gradual problem of non-substance addiction, especially on social media and virtual environments, cannot be overlooked (Grajek, 2022).

There is a need to lead the line of support in several directions. On the one hand, we need to intensively rehabilitate the original families, while building a quality aftercare network. In residential care facilities, it will be necessary to intensify the preparation of young adults for departure; ideally, this preparation should begin on the day of their arrival. We see synergistic cooperation across disciplines, from social work to sociology to special education, as essential. The energy invested and the money spent will be returned to our society many times over. The young adults will have the opportunity to overcome difficult challenges tied to their past, both in their original families and in children's homes, and will have an equal opportunity to fulfil their potential. After all, equal opportunity is at the heart of the inclusion paradigm. We have a long and challenging process ahead of us. But it will undoubtedly be meaningful and the results will be undeniable!

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Primary Paper Section: A

Secondary Paper Section: AM

PREVENTION OF AGGRESSIVE BEHAVIOUR OF PUPILS AS THE BASIS FOR CREATING A SAFE SCHOOL ENVIRONMENT

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This article is a partial output of the project KEGA 012KU-4/2022 Safety of School Environment – New Challenge for the Development of Selected competences of Primary and Secondary School Teachers

Abstract: The study presents current situation regarding the occurrence of aggressive behaviour among primary, lower secondary and upper secondary school pupils. Besides aggressive behaviour of various intensity and significance among pupils, quite common is also aggressive behaviour of pupils towards teachers. One of the significant problems nowadays is also aggressive behaviour of pupils in the online environment, especially cyberbullying. The author points out the necessity of implementation of prevention in the school environment. Effective prevention of aggressive behaviour of pupils significantly contributes to the creation of safe school environment.

Keywords: aggressive behaviour of pupils, cyberaggression, bullying, cyberbullying, prevention, prevention in the school environment

Introduction

Aggressive behaviour is definitely a socio-pathological phenomenon, which is complex and multicausal. It also appears among primary and secondary school pupils (S. Bellová, 2021; S. Bellová, G. Siváková, K. Tišťanová, 2019; O. N. Saracho, 2017; J. Škoda, P. Doulík, J. Svobodová, 2022). Aggressive behaviour means violation and restriction of the rights of others – symbolic or real restriction, damage or destruction.

As P. Ondrejko (2000) points out, violence committed by youth can be considered a specific form of human behaviour that leads to enforced fulfilment of wishes, interests, orders, etc. More and more young people choose violence in the fight for their own acceptance, acknowledgment, group or social rise, in their effort to achieve certain status position.

Aggression is a continual process that can evolve. Among most significant forms of problem behaviour of pupils belongs committing crimes. Crime statistics report also the crimes committed by minors and juveniles in the Slovak Republic. Each year, minors and juveniles commit violent crimes as well. Of the most significant crimes we can mention murders and robberies. Within the last ten years, minors committed a murder only in 2021 (1 case), but juveniles each year except for 2015, most cases (5) in the years 2011, 2012 and 2020. Robberies occur among minors as well as juveniles, the number of cases is much higher in case of juveniles.

1 Aggressive behaviour of primary and secondary school pupils

As pointed out by P. Harsa, D. Kertészová, M. Macák, I. Voldřichová and I. Žukov (2012), aggressiveness is a complex phenomenon present in everyday life and it has its positive and negative sides. Aggressiveness needs to be controlled, cultivated, regulated and directed in a prosocially-meaningful way in order to prevent disruption of relationships among people and social norms.

Aggressive behaviour can escalate into bullying, which belongs among the most significant negative phenomena in current schools, but it can also take place outside of school. Bullying is defined by several authors and we can find common features in the individual definitions. The main point is that it is a long-term, repeated and intentional harming with the intention to gain dominance. It is characterised by disproportion of forces. Victims are for some reason defenceless. It is intentional and repeated violence directed against such pupil or pupils, who are not able to or cannot defend themselves. Bullying is manifested in many forms. Bullying in schools most often takes place

during breaks, in locker rooms, toilets or in other places where teachers do not supervise. There are also cases when children are bullied on their way to or from school.

Bullying is manifested in many forms. Unlike bullying in the past, nowadays it shows some alarming signs: increasing number of bullying cases, appearance of still younger aggressors, increased brutality and sophistication of bullying.

P. Ondrejko (2021), M. Bartoňová and M. Magová (2018) emphasize that besides family, school has its specific role in the process of socialisation. At school children learn the basics of conformity, but also deviation, it creates prerequisites for success and for failure, primary and secondary deviation takes place there, also labelling. Schools should create and ensure safe environment for all pupils. In the school year 2018/2019, State School Inspection of the Slovak Republic carried out inspections in 79 primary and lower secondary schools and 25 upper secondary schools (13 grammar schools and 12 secondary vocational schools), in which it focused on detecting safe school environment and relationships among participants in education. In primary and lower secondary schools, bullying was present in almost all controlled schools. 16.9% of pupils were repeatedly bullied. Bullying was witnessed once or more times by 40.3% of the respondents. In upper secondary schools, 8.5% of pupils did not feel safe in school. This finding was supported also by the pupils' questionnaire results, according to which almost each 15th upper secondary school pupil has been subject to bullying not only in places outside the school, but also during breaks in classrooms, corridors or toilets. The results of the State School Inspection in the school year 2019/2020 regarding the occurrence of bullying among primary and secondary school pupils confirm the prevalence of this negative phenomenon (research took place in 31 primary and lower secondary schools, 7 grammar schools and 8 secondary vocational schools). 14.5% of primary and lower secondary school pupils were victims of bullying, 7% of the grammar school pupils and 13% of the secondary vocational school pupils. More than a quarter of the respondents witnessed bullying, specifically 37% of the primary and lower secondary school pupils, 21% of the grammar school pupils and 27% of the secondary vocational school pupils.

Aggressive behaviour reflects also in the virtual environment. Pupils post on the internet hateful messages and comments that are referred to as cyberhate. The individual areas of risk behaviour can overlap and combine in the cyberspace. Cyberaggression is manifested in many forms. A very dangerous and widely spread form is cyberbullying (S. Hinduja, J. W. Patchin, 2022; Q. Chen, Y. Zhu, 2022; D. Strohmeier, P. Grading, 2022).

Cyberbullying and bullying, besides the obvious differences, also have some common features. In some cases, combination of both occurs – when physical bullying is recorded and posted on the internet, which causes even more harm and humiliation to the victim.

Amendment to the Criminal Code No. č. 300/2005 with effect from July 1st, 2021 deals with dangerous electronic harassment. Even this fact points to the significant danger of cyberbullying and social necessity to deal with it.

Cyberbullying is a serious and wide-spread educational problem. This is also evidenced by the results of objective researches that were implemented in the Slovak Republic.

Empirical findings of J. Tomková, I. Szamaranská, J. Varholíková and I. Belica (2015) suggest that at least one negative act by the means of Facebook towards another person has been initiated within the last six months by 49.7% of children and 63.1% of adolescents. At least one of the negative acts by the means of Facebook within the last six months has

experienced 51.7% of children and 71.9% of adolescents. Cyberbullying – repeated experiencing of negative acts on the internet in total (at least once a week in the period of the last six months) has experienced 13.1% of children and 5.5% of adolescents.

K. Kopecký et al. (2015) found out that children in Slovakia are most often subjected to verbal attacks (28.38%), next comes account compromising, online accounts and password cracking (26.94%) and quite widely-spread is also threatening and intimidation (6.81%). They found out that repeated attacks in the cyberspace was reported by more than 48% of the Slovak respondents aged 11 – 17 years.

According to the findings of M. Dulovics (2018), 10.2% of pupils have committed some form of cyberbullying twice or more often.

Results from the research among upper secondary school pupils (K. Kohútová, 2020) show that 79% of the respondents experienced insulting on the internet, 78.1% experienced defamation, 65.7% experienced sexual innuendos, 63.8% experienced sending defamatory pictures and 62.9% experienced humiliating comments.

Situation among children and youth is also illustrated by empirical findings of M. Pétiová (2021) regarding experiences of pupils with electronic bullying by the means of a cell phone, internet or social network. In 2010, 87.8% of the respondents did not have such experience, in 2014 it was 72.6% of the respondents and in 2020 it was 70.1% of the respondents.

Another significant concern nowadays is also increased aggressive behaviour towards teachers, or school employees, which is proved by the results of many foreign researches (C. De Wet, 2020; L. Garrett, 2014; T. Kauppi, M. Pörhölä, 2012). The reasons of aggressive behaviour towards teachers may be on the part of teachers and also pupils. On the teacher's part, it may be inappropriate communication with pupils, wrong educational style, insufficient preparation for lessons, unjust evaluation of pupils, little energy. On the part of pupils, it may be frustration, boredom, efforts to draw attention to themselves, personality of an actor and his/her personal characteristics, influence of the family environment. There are many causes of aggressive behaviour of pupils, most often it is a combination of several factors. Unsolved conflicts are often in the background of such behaviour.

Researches aimed at identifying aggressive behaviour towards pupils were implemented also in Slovakia and in the Czech Republic. The seriousness of the situation is also confirmed by the findings of M. Pétiová (2015), which concern relationships between pupils and teachers. In 2014, compared to 2005, the number of respondents – pupils who liked their teachers and respected them, has declined (from 17.1% to 10.0%) and the number of pupils who don't like their teacher has increased (from 6.0% to 9.2%), or eventually pupils who are indifferent to teachers (from 3.0% to 8.1%).

In the research that took place in the conditions of lower secondary schools in the years 2010 to 2013 (L. Csémy et al., 2014), 52% of teachers stated that they did not experience vulgar verbal aggression towards themselves within the last year, 28.8% has experienced it once or twice, more frequent occurrence was reported by 19.2% of the respondents. 4.4% of the teachers have been the object of physical aggression by pupils in the last year, 1.4% of them repeatedly.

M. Niklová and M. Šajgalová (2016) found out that that only 20.26% of the teachers did not experience aggressions towards themselves.

According to the results of I. Emmerová and J. Kohútovej (2017), 85.4% of primary and secondary school teachers experienced aggressive behaviour (of various intensity and severity).

In this context, cyberspace represents a considerable risk. Cyberattacks towards teachers have become a reality, which teachers encounter directly as victims or they may see it among their colleagues.

In 2016, a research on cyberbullying of teachers by pupils was implemented in the Czech Republic among primary and secondary school teachers (Kopecký, Szołkowski, 2016b). According to the results of this research, 21.73% of teachers (1118 out of 5136) were in the past victims of some cyberbullying form. The most frequent forms of cyberbullying attacks on teachers were verbal attacks through cell phones or internet, molestation through short unanswered phone ringing (e.g. in the evening), threatening or intimidation through internet or cell phone services, distribution of humiliating, mocking or embarrassing photos, hacking their electronic accounts (e-mail, social network accounts, etc.). Regarding the length of cyberbullying attacks on teachers they discovered that short-term attacks prevailed, those that lasted less than one week or one to two weeks.

2 Prevention of Aggressive Behaviour at Schools

Prevention in the school environment is highly necessary. Schools, especially primary schools, have an important role in prevention, as they are frequented by the whole population since the age of 6, with some rare exceptions. Unfortunately, we cannot count on families, as they quite often fail in their educational and socializing function.

Educational process and educational influence on pupils requires interconnection of *cognitive, affective and conative components* of pupils' personalities – interconnection of preventive action on: "Knowledge – attitudes - social skills".

Implementation of *specific prevention* (focused on the individual types of problem behaviour) and of *non-specific prevention* at schools must be a necessity.

It is also important to pay more attention to university preparation of future teachers in the area of prevention. To provide teachers in practice with educational activities aimed at prevention and to motivate them to participate on these activities. To increase the awareness of active protection on the internet in the area of cyberbullying prevention. *To increase the number of specialists at schools*, who are prepared to implement socio-educational prevention on a professional level.

The aim of primary prevention is to create conditions for healthy physical, mental and social development at schools. Here we can include new approaches of teachers towards pupils that put emphasis on open and partner-like dealing, new effective forms of cooperation with parents etc. It is suitable to implement preventive programmes aimed at harmonization of relationships and improvement of school climate, constructive conflict solving, coping with stressful situations, development of social competences etc. Wide implementation of cooperation among pupils is a significant factor in prevention of bullying and other forms of inappropriate behaviour of pupils. According to T. Jablonský (2009, 2010), interpersonal skills such as e.g. the ability to communicate and work in a team are becoming more and more important.

In the school environment it is *important to consistently address even the less serious problems with pupils' behaviour*, because their overlooking or underestimating may lead to more serious forms of deviant behaviour. The key task is to prevent deepening of inappropriate behaviour of pupils. In connection with dealing with bullying, D. Rosová (2018) recommends not to overlook bullying – to avoid belittling, cautiously investigate the findings, to contact experts from other fields in more complicated cases, and to contact police in case of misdemeanours and crimes, regardless of whether the perpetrator is a child or an adult.

When implementing prevention of risk and problem behaviour it is necessary to pay attention to the *systematicity*. Regular

implementation of preventive activities is much more effective than any one-time activity. Prevention in schools is implemented through various forms of preventive actions. It is advisable to incorporate prevention into the individual school subjects, most commonly into ethical education, science of society, literary education and other subjects that allow it within their curricula.

To implement prevention through effective forms and methods. Most suitable are preventive projects and programmes. Efficient and effective primary prevention includes continuous and complex programmes, interactive programmes, especially programmes helping pupils to cope with social pressure, focused on improvement of communication, non-violent conflict solving, refusal of addictive substances, boosting healthy self-esteem, coping with anxiety and stress. Not to implement inefficient prevention (e.g. intimidation, banning, moralizing or exaggerating the consequences etc.).

Implementation of efficient preventive activities requires *to monitor the occurrence of undesirable phenomena*, to forecast the likelihood of occurrence of the given phenomenon and consider the choice of methods and forms of action, both in the field of primary and secondary prevention in the school environment. To continuously monitor the behaviour of pupils and in cases of suspected violations of their healthy personal development to ensure their protection and to address the problem without delay in cooperation with the school management and the child's legal representatives. When it comes to bullying, teachers need to realise that it is not just a matter of the aggressor and the victim. Witnesses to bullying also play an important role, as they can play a positive role on the one hand, but a negative one on the other. It is important to *cooperate with professionals* from counselling centres.

The staffing of prevention in schools, i.e. the implementers of prevention, plays an important role. Prevention can be carried out by pedagogical and specialist school employees. School management and implementers of preventive activities must adequately react to current trends and challenges in this area, plan preventive activities and effectively cooperate with specialists outside the school environment (e.g. employees of counselling facilities, policemen – preventionists, doctors and other specialists). The importance of functional management within school is pointed out by T. Jablonský (2017), J. Veteška and M. Kursch (2018), it is important also in prevention. Schools receive various offers for preventive activities or long-term programmes, it is essential to check in advance the offered preventive activities in order to avoid the possible unwanted influence of lay and unprofessional activities, as well as the explicitly harmful influence of e.g. cults or sects.

Conclusion

Aggressive behaviour, bullying and cyberbullying are widespread, and effective prevention is essential. The prevention of risk or problem behaviour of pupils is closely linked to the education and socialisation of pupils. As school is the dominant educational and socialising agent, it also plays an important role in prevention.

To prevent the risky use of modern technologies by primary and secondary school pupils, schools need to inform pupils in an age-appropriate way about the risks of their use and organise engaging preventive events on the subject, e.g. on the occasion of Safer Internet Day.

Prevention of risk or problem behaviour of pupils should be implemented as an integral part of the educational process. All teachers must participate in prevention.

Education in the school environment should not only focus on the development of cognitive abilities, but should also pay attention to the personal and social development of pupils. Teaching and professional staff in schools should aim to harmonise relationships and improve the school climate.

Creating a safe school environment and improving classroom relationships, providing pupils with a sense of psychological safety and security, eliminating unwanted behaviours, including risky and problem behaviours, is a current challenge for schools. Despite the fact that each school is original (in terms of its location, composition of pupils and teachers, each school has its own problems and specificities), it is necessary to build a safe environment, to implement systematic, effective prevention and to consistently address behavioural problems.

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PERSONNEL LOYALTY AS THE ASPECT OF BUSINESS VALUE

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Abstract: Personnel loyalty is an important factor in all business sectors and activities. The question of how to keep competent employees in today's highly competitive environment appears increasingly as the price of work rises. Thus the value of loyalty also rises for employees. The subject of our investigation are employees of companies active in the gambling industry, confronted with a highly competitive environment at the workforce level. The study examines individual factors that affect employee loyalty in this sector using quantitative methods to test the hypotheses drawn up based on the review literature. Research results show five factors influencing employee loyalty in this industry: compensation, work environment, job fit, training and development, and leadership.

Keywords: Personnel loyalty, business value, gambling industry, human resource management.

1 Introduction

Human resources represent a key aspect of the competitiveness of enterprises. They are part of the intellectual capital of the company. It is the effort to attract a high-quality and capable workforce that leads companies to constantly improve their human resources management policy. Retaining employees and minimizing their turnover is a very difficult challenge for businesses. Employee loyalty plays a very important role here. It significantly reduces the risk of labour turnover, and employee loyalty has many other benefits for companies. As Byars and Rue (2000) reported, in terms of profit creation, loyal employees tend to perform better than expected with the highest motivation and ability. The efficiency of the work will be at a high level and generate more profit for the company. Regarding costs, loyal employees tend to stay with the company and always recommend their company to others as a good workplace. As a result, the company's recruitment costs will be reduced. In short, employee loyalty is one of the keys to the sustainable development of companies (Balzer et al., 2020).

According to Jędrzejczak-Gas and Wyrwa (2005), increasing employee loyalty is particularly important during the expansion phase of the business cycle. Employees can quickly change their workplace or even leave during the expansion phase. Today, in a time of tough competition and a dynamically changing environment, there is increasingly important not only to acquire new employees but also to retain current employees. New forms of employment and work organization help situations in which employees start work in several organizations simultaneously or are short-term affiliated with the employer during project implementation. This enables organizations to quantifiably and qualitatively adapt human resources to the organisation's needs. However, it should be noted that this also raises challenges for retaining specialists in the organization whose competencies are important for the functioning of the organization.

Among the first researchers to clarify the meaning of loyalty was Walton (1985). According to him, performance in an organization improves when the organization moves from a conventional control-oriented approach to managing employees through loyalty. As also stated by Armstrong (1999), employee loyalty is thus an important attribute of functioning firms, while it significantly contributes to the growth of the firm's human capital. One of the ways to increase it is training. It is questionable, however, how high-quality the given training is and its impact on employee loyalty. Some authors like Meyer and Allen (2012), and Glova et al. (2018) perceive this issue as the employee's belief that it is necessary to attach to the company or feel an obligation to her. On the other side, there are

authors such as Rusbult et al. (1988). four options for how an employee reacts to dissatisfaction.

Currently, there is an interactionist approach in research, which is a combination of both approaches and thus, also the components of loyalty. The emotional one forces the employee to attach himself to the company and is associated with the employee's commitment to the institution. The behavioural component represents the employee's attitude towards the employer, which predicts his future behaviour, and his expression is linked to action, and activity (Coughlan, 2005). According to Guillon and Cezanne (2014), loyalty to the company can then be defined as a multidimensional construct; of a strong sense of belonging, belonging and identification with the company, its goal and mission, which manifests itself in a positive attitude towards the company, willingness to work and remain employed. Likewise, according to these authors, employees can be divided into four groups based on their loyalty: a) truly loyal: an employee who is truly devoted to his company and is determined to remain in it in the future; b) approachable: an employee who is committed to the company, but not so much as to remain in it even after changes or life situations; c) trapped: an employee who is not committed to his work and the company, but is willing to remain under the current conditions, be it salary or privileges; and after d) high risk: an employee who is not committed to the company and does not plan to stay in it in the future. Based on this division, we can conclude that the second and fourth categories represent employees who are impressionable and can move to the first or third category. These groups should focus on the organisation's activities, trying to retain employees. On the other hand, the third category represents the group of employees that is least influenced. According to Glova et al. (2018, 2020), competitiveness in human resources is always a key issue in companies. Companies are constantly improving their human resource management policies to attract a capable workforce. A more difficult challenge that companies face is how to keep employees tempted by other competitors. This is a danger that businesses try to avoid or at least limit. As we can see from the above analysis, employee loyalty is the key to the sustainable development of companies. And in order to retain employees, we need to find out what influences an employee's intention to stay with the company.

Considering this, the aim of this study is to define significant factors affecting employee loyalty in the gaming industry. The results of the presented study make it possible to find answers to the question: "What are the significant factors of loyalty in the gaming industry?" However, it should be noted here that the answers to this question and the applied research methodology can inspire companies from the given sector to adapt human resources management strategies and policies.

In the following part of the study, based on the performed research analysis of the literature, we analyze in more detail the factors influencing the loyalty of the company's employees. In the case of these factors, we formulate hypotheses about their significant influence on loyalty. Subsequently, based on the multiple linear regression method, we will evaluate the significance of these relationships.

2 Factors affecting loyalty: An overview with hypotheses

In the framework of this study, we will perceive loyalty based on the principle of interconnectedness. From this point of view, there is no process or phenomenon that exists individually, completely isolated from others, but on the contrary, there are processes and phenomena in relationships, bonds and dependencies. This principle means that if we think about an object, it cannot be understood as an independent. We have to put it in a relationship with others, that is, in the whole context in which the object exists. Only in this way can we evaluate the conclusions objectively. There can be no doubt that while the

subject of loyalty is an individual, the object of loyalty has varied over time. As an extreme example, there can be a comparison to the Middle Ages, where all power was centralized in the monarchs and nobility, which was the object of loyalty in the master-servant relationship. The opposite pole represents the present, where everyone is equal, and loyalty to an individual is no longer an obligation. Thus, loyalty is eccentrically understood as a relationship between employees and their organization. The definition most suitable for our purposes and will be applied in the research is from Auer Antonicic and Antonicic (2011), i.e. "employee's intention to stay with the organization for a long time, even when receiving offers for more attractive salary from other organizations."

2.1 Financial compensation for work

Compensation for work is the broadest term for payment provided to employees in exchange for work (Sarma, 2009). It can be wages, salaries, commissions or rewards. Wage, salary and income are often interchangeable, but they are not the same. Wages are paid based on hourly rates, daily rates or quantity of work; in contrast, a paycheck is a fixed payment often received per month, regardless of the number of hours worked. The total amount that employees receive each month is called income. In addition to earning a wage or salary, most employees can receive other benefits such as vacation, health care, insurance, and pensions. As mentioned in Andrejovska and Hudakova (2016), a very important aspect of personal income is also tax levied directly on personal income, income tax. According to Andrejovska et al. (2017) and Mihokova et al. (2016), this aspect can significantly influence the purchasing power of employees remunerated for their work activity.

The main challenge for any organization is establishing a fair compensation system. Businesses may have different views on the remuneration system, but generally, they all strive to achieve the following objectives (Beach, 2007): attraction, retention, motivation and legal compliance. The higher companies pay, the more attractive they are to qualified applicants. A fair compensation system will help retain competent employees to some extent. All compensation components, such as basic salary/salary, bonuses and allowances, must be effectively set up to motivate employees. Businesses must comply with employment law and related remuneration laws.

Undoubtedly, income from employment is often considered a measure of its quality or someone's level of success. A high income helps satisfy employees' physical needs, so they can fully devote themselves to work and pay more attention to the need for self-actualization. Adequate income significantly affects employees in the following aspects (Morgeson et al., 2009): high motivation to perform well, less prone to look for another job, a higher sense of responsibility for their work and a higher sense of discipline in following the rules of the organization. Based on the concept mentioned above and studies, the authors give hypothesis H1 following:

Hypothesis H1 Financial Compensation affects employee loyalty in the gambling industry in Slovakia.

2.2 Work environment

The term "work environment", otherwise known as "working conditions", refers to the surrounding conditions in which employees work (Cardy and Leonard, 2015). Worker performance and behaviour are always affected by physical working conditions such as noise, lighting, temperature and ventilation (Sarma, 2009), discussed in more detail below.

Noise: Noise, annoying sounds, is the biggest distraction in the industry. US standards define noise as "unwanted sound". When noise is too loud, it not only affects employees but often causes psychological and physical side effects as well (Bernardin and Russel, 1993). In addition to various health disorders, it can hamper performance and cause fatigue. Increasing mechanization has caused a significant increase in industrial

noise, temporary or permanent hearing damage, and disruption of speech communication. Noise control is a problem related to a system that consists of a noise source, a sound propagation path and a receiver. Noise prevention and reduction measures must be aimed at control of noise sources; prevention of propagation, amplification and reflection of noise; and isolation of workers. Whenever necessary, noise abatement measures must be followed. While offices can be made noise-proof, making factories absolutely noise-free is a task that requires more effort (Byars and Rue, 2000). Noise levels can be reduced by designing better machines, but they cannot be completely eliminated. Therefore, workers must learn to live with a certain amount of noise. It is generally accepted that noise is a distraction and must be kept to a minimum to achieve better results. Although it is impossible to completely eliminate noise in a factory environment, some effort should be made to keep it within acceptable limits.

Lighting: Although humans have excellent adaptability, light and colour affect the environment, well-being, morale and fatigue. Cases of visual impairment in the workplace are common, and their causes are varied. They should be taken seriously, and the workplace should strive to provide optimal visual conditions. According to Morgeson et al. (2009), good lighting should meet optimal lighting, uniform lighting, avoidance of glare, appropriate contrast and correct colour. It has been shown that adequate lighting in the workplace significantly affects human performance. The significant degree of illumination varies depending on the task being performed. Good and correct lighting depends on the visual task to be performed. Proper lighting brings a better mood and results in a partial improvement in efficiency and productivity.

Ventilation: Industrial ventilation is considered an essential part of air conditioning. With the use of heating, cooling and humidifying devices, the interior of the working space is brought to a suitable state for the products or for the thermal comfort of the workers. When used alone, ventilation often serves to cool workers or reduce the density of a contaminant in the air they breathe (Bhadury, 2000).

Temperature: The temperature of vital organs in the body must be maintained within certain limits if a person is to survive in an adverse environment. The highest/lowest permissible limits must be established for the temperature extremes of the workplace to maintain thermal balance throughout the working day or during the time required for finishing work. Workers will be prone to heat collapse if the integration of workload and ambient heat is so great that thermal balance cannot be maintained. While physical work is impaired in conditions of high temperature and slow air, there is no evidence to suggest that mental work is also impaired under similar conditions. People living in hot, humid climates do as much mental work as those in cold climates, even though they seem to have more breaks. Although there may be economic and technical challenges in reducing the harmful effects of heat and lighting, continued efforts are necessary to ensure an adequate and suitable work environment.

As discussed in Anderson et al. (2007), the working environment has a strong influence on the efficiency and satisfaction of employees. It is obvious that a poorly lit, poorly ventilated and overcrowded workplace hinders work productivity. The working conditions cause more fatigue, carelessness, absenteeism and indiscipline among employees. According to research, more than 90% of respondents confirm that the quality of their work environment affects their mood and attitude towards work, and approximately 89% of respondents say that the quality of their work environment is very important to them. It is obvious that working in a suitable work environment makes workers efficient. Based on the concept mentioned above and studies, the authors give hypothesis H2 following:

Hypothesis H2 The work environment affects employee loyalty in the gambling industry in Slovakia.

2.3 Values and principles

Value congruence is equivalent to the concept of person-organization fit, or the fit between a person's values and beliefs with the organization's values and rules (Meyer and Allen, 2012). O'Reilly et al. (1991) hypothesizes that the mismatch between individual growth aspirations and needs and organizational forms causes unintended consequences such as passivity, aggression and related behaviours that interfere with achieving organizational goals. Recent organizational behaviour research has focused on empirical studies of value congruence. Kristof-Brown, Zimmerman, and Johnson (2005) viewed value congruence as "the compatibility between an individual and the work environment that occurs when their characteristics are well matched". Value congruence is an expression of fit between a person and a culture and shows that employees adapt better to the work environment when organizational values and their personal value orientation are congruent (Vandenberghe, 1999). Google is arguably the pioneer in developing and maintaining value alignment. Stacy Savides Sullivan, Google's Chief Culture Officer, described why Google emphasises its hiring. Stacy Savides Sullivan said:

"I think one of the hardest things to do is to make sure that we're hiring people with the qualities we're looking for in a Google employee. Google is defined as someone who is quite flexible and adaptable and doesn't focus on titles and hierarchy and gets things done. That's why we put a lot of emphasis on our hiring processes when interviewing first to determine if the person has the background to do the job in addition to academic and professional knowledge and experience. But they will also be a good culture or team".

Value alignment is evident at Google as it strives to achieve a good fit between the type of employees and the preservation of its culture and core values — the elimination of hierarchy and a collaborative environment.

Empirical evidence suggests that high levels of value congruence have various benefits.

Congruence has been verified to be correlated with work attitudes such as job satisfaction and organizational commitment. Value congruence can be used to predict intention to quit and turnover related to prosocial behaviours such as organizational citizenship behaviour (O'Reilly et al., 1991), self-serving teamwork (Posner, 1992), and contextual performance (Goodman and Svyantek, 1999). Cable and Judge (1996) finds that organizational members who share organizational values are more committed to the organization, more satisfied with their jobs, and less likely to change jobs. A high level of congruence between individual and organizational values can lead to such positive work attitudes as job involvement, career success, health and adaptation, and lower stress and instinctive behaviours that benefit the organization. Recent research has shown that value congruence is necessary for positive work attitudes and employee behaviour (Meyer and Allen, 2012). Employees tend to love their jobs, work more dedicatedly, and stay with the organization when their goals and values align with the organization's goals and values (Vancouver and Schmidt, 1991). These conclusions bring us to the formulation of another hypothesis H3:

Hypothesis H3 Congruence of values affects employee loyalty in the gambling industry in Slovakia.

2.4 Suitability of the person for the job

Person-job fit is the fit between a person's abilities and job demands or desires and job attributes. The need and supply perspective elements include the desires of individuals and the job attributes that can fulfil those desires. Individuals' desires consist of goals, psychological needs, interests, and values. A job offer is considered a general description of the job's occupation, salary or other attributes. The ability demand perspective includes the job requirements required to perform

the job tasks and the abilities that can be used to satisfy the job requirements. Job requirements usually include the knowledge, skills and abilities required to perform the job satisfactorily level (Caldwell and O'Reilly, 2003). Competencies consist of an employee's education, experience and skills or knowledge, skills and abilities.

There is considerable evidence that high levels of compliance have a number of positive outcomes. Edwards et al. (2003) confirms that job satisfaction, low job stress, motivation, performance, attendance and retention are positive outcomes of job-employee fit. When congruence is assessed as the compatibility between what the employee wants and what he gets from performing the job, it is correlated with improved job satisfaction, adjustment to organizational commitment, and reduced turnover intentions. Additional benefits to job performance have been demonstrated when the definition of fit is expanded to include a match between abilities and job demands. Edwards et al. (2003) also demonstrate that validated and structured processes for identifying fit lead to more effective employee selection than unstructured techniques. The fourth hypothesis is, therefore:

H4: The match between personality and job affects employee loyalty in the gambling industry in Slovakia.

2.5 Training and progress

Training is an organized way in which organizations ensure the development and improvement of the quality of new and existing employees. Training is a systematic approach to learning and development that improves the individual, the group and the organization (Goldstein and Ford, 2002; Khawaja and Nadeem, 2013). Thus, it is a series of activities undertaken by an organization that leads to acquiring skills for growth. It thus contributes to the well-being and performance of human capital, the organization, and society. According to Galanou and Priporas (2009), training serves as an intervention to improve the quality of goods and services of an organization in the face of strong competition by improving the employees' technical skills. Training has been invaluable in increasing the productivity of organizations. It improves employees' resources and allows them to learn their jobs and perform competently. Thus, not only the productivity of employees but also the productivity of organizations increases. Various researchers types of researchers to the positive impact of training on employee productivity. Training as a process is one of the most widespread methods for increasing the productivity of individuals and communicating the organization's goals with personnel. Rohan and Madhumita (2012) also supported that investment in employee training in decision-making, teamwork, problem-solving and interpersonal skills has a positive effect on organizational growth levels as well as employee performance. Training affects employee behaviour and job skills, resulting in increased employee performance as well as constructive change (Satterfield and Hughes, 2007). Training is the most effective way to motivate and maintain high-quality human resources within an organization (Hutchings et al., 2009). Lowry et al. (2002) added that training is a way to increase employee engagement and maximize employee potential. According to Konings and Vanormelingen (2009), Colombo and Stanca (2008) and Sepulveda (2005), training is a tool that fundamentally affects the successful achievement of organizational goals and objectives. However, the optimal goal of any organization is to generate high revenue and maximize profit, and an effective workforce is an important tool for realizing this. Thus, the workforce is only effective if it is provided with appropriate training and development, leading to productivity. The conclusion can therefore be the hypothesis H5 formulated as follow:

H5: Employee training affects employee loyalty in the gambling industry in Slovakia.

2.6 Leadership

"The challenge of leadership is to be strong but not to be rude; be kind but not weak; be bold but not violent; be thoughtful but not lazy; be humble, but not timid; to be proud but not arrogant; be funny but not stupid." (Rohan and Madhumita, 2012).

That leadership is key to the success of any organization. There are many definitions and approaches to leadership, but they are generally based on the following basic assumptions.

The first assumption is that leadership is an organizational or group phenomenon expressed by role behaviour performed by an individual in order to influence and regulate the activities of group or organization members towards a common goal. The second assumption is that leadership is both relational and attributional. Leadership comes into play when followers grasp the leader's behaviour in some way, acquire the leader's attempts at influence, and then attribute leader status to the individual. The third assumption is that leadership can be studied in terms of its content and processes. In other words, understanding the phenomenon of leadership requires the characteristics of basic leadership elements – leader, followers, situational context; and the main relational processes – the leader-follower influencing process, the leader-context relational process and the context-follower relational process.

A classic research approach to leadership is identifying the leader's role behaviour in groups. Researchers have pointed to three roles of leaders – the social role, the task role, and the decision-making role (Cable and DeRue, 2002). However, this approach seems to bring daily routine maintenance closer to the status quo rather than the true phenomenon of future leadership, as observed in the company. For this reason, leadership studies must shift from the current preoccupation with tasks, people, and participative orientations to the key behaviour we see in leaders who create profound changes in organizations and their members-behaviour, vision formulation, and the development of strategies to achieve the vision. This trend in leadership research is called the "neo-charismatic paradigm" (Conger and Kanungo, 2003), and the Conger-Kanungo model of charismatic leadership is the best representative. The model views charismatic leaders as moving organizational members from an existing state toward a desired future state. It includes three stages. Phase 1 is an evaluation of the status quo. In this phase, leaders analytically assess the current state to identify gaps, underutilized opportunities, and environmental constraints. Ultimately, charismatic leaders are very sensitive to social and physical environments. Therefore, they implement all methods of pragmatic evaluation, including internal and external sources. Phase 2 is the formulation and expression of the future vision. After assessing the environment, charismatic leaders create and proclaim an idealized vision, the desired goals to achieve the organization's goals. A sense of strategic vision generally characterizes charismatic leaders. The third stage is the realization of the vision. In the final phase, charismatic leaders engage in behaviour that shape followers' belief in the leader's vision, more specifically in the leader's ability to achieve the organizational goals necessary to achieve the vision.

Charismatic leadership brings many benefits, leading to high internal cohesion, low internal conflicts, high-value congruence and high consensus. In addition, thanks to the guidance of a charismatic leader, followers are concurrent in achieving common goals. At the individual level, follower outcomes can be determined in two ways: followers' behaviour and attitude toward the leader and the task. Regarding follower behaviour with a charismatic leader, followers show a high degree of respect for the leader, a high degree of belief in the leader, and a high degree of satisfaction with the leader. Regarding task attitudes, followers exhibit high levels of team group cohesion, high levels of task accomplishment, and high levels of feeling empowered within the organization to complete tasks (Conger and Kanungo, 2003).

Based on the concept mentioned above and studies, the authors give hypothesis H6 following:

Hypothesis H6 Leadership affects employee loyalty in the gambling industry in Slovakia.

3 Data collection and data analysis

The research uses a questionnaire to collect information from company employees working in the gambling industry sector (activity of gaming and betting offices), specifically in the subgroup of table games. The questionnaire is compiled based on the above-analyzed six independent variables and one dependent variable derived from qualitative research. It contains 23 questions composed as statements on a Likert 5-point scale, ranging from "strongly disagree" (1 - one) to "strongly agree" (5 - five), and four closed control questions. The questionnaire was distributed among the employees of several companies in the gambling industry - table games. The total number of responses was 141.

According to the Statistical Office of the Slovak Republic and the ESA 2010 methodology, in the sector (92) Activities of gaming and betting offices, employment within the Slovak Republic reached 4931 persons. Our research focuses on table games, which include card games, roulette and casino dice. We estimate that 5 to 6% of all employees of the gambling industry work within the sector (92) mentioned above, which is approx. 250-300 employees. The number of answers, in this case, is 141, which represents approx. 50% of all employees of this subgroup. From this point of view, the results of the given research can be relevant for the employees of the given subgroup.

The structure of the groups and questions of the questionnaire can be seen in Table 1, where it is possible to find a specific group, the questions asked, and the abbreviation symbol used with mean values of the particular variables from questionnaires. From a demographic point of view, out of a total of 141 (100%) responses, individual responses were filled in by 103 (73%) men and 38 (27%) women. An approximately similar ratio is typical for the structure of the sexes working within this subgroup. That is due to the nature of the profession requiring a certain degree of resistance to pressure.

Table 1 Groups and variables used in questionnaires with mean values of the particular variables

Group	Variable / Question	Symbol / Value
Compensation for the work	My reward for the work done corresponds to my contribution and responsibility.	C1 3,7
	My remuneration for work is sufficient in my current life situation.	C2 4,1
	The rewards and benefits that the employer provides me are adequate.	C3 2,9
Working environment	The work equipment provided is very good.	W1 4,2
	The working environment is comfortable.	W2 4,3
	The temperature, lighting and noise in the workplace is adequate.	W3 3,5
	I feel safe at work.	W4 4,3
Values and principles	My values and principles match my company.	V1 3,3
	I respect the culture of the company.	V2 4,0
	I am determined to follow the strategies of the company in which I work.	V3 4,2
Employment selection	My competences are sufficient for the performance of the job.	E1 3,9
	I feel motivated and satisfied when I work.	E2 3,5
	I like my job.	E3 4,1
Training and promotion	The company provides me with enough opportunities for personal development for the purposes of the company.	T1 3,1
	Consultations and meetings are useful.	T2 3,1
	My supervisor provides me with support and training in the performance of my work.	T3 3,3
	I have the possibility of development and advancement.	T4 3,0
Management/Leadership	My superior still listens to my opinion.	M1 4,0
	My skills are improving thanks to my superior	M2 3,9
	I respect my superior.	M3 4,5
Loyalty	I am willing to recommend my company as a good place to work.	L1 3,9
	I am proud to talk about my work and its results.	L2 3,7
	I will continue with the company, even if they offer me something better elsewhere.	L3 3,0

Other demographic data collected as part of filling out the questionnaire were job position (84.4% regular employee, 8% team leader and 7.1% manager), level of education (full secondary education 63.1%, undergraduate student: 12.8%, university graduate: 24.1%), age (less than 20 years: 9%, 21-30 years: 63%, 31-40 years: 23%, and over 41 years: 5%).

4 Econometric model and its testing

The research uses a questionnaire to collect information from company

$$Li = \beta_i C_i + \beta_i W_i + \beta_i V_i + \beta_i E_i + \beta_i T_i + \beta_i M_i + \epsilon_i$$

As seen from the equation above, L_i represents the dependent variable of the i -th observation. At the same time, it is expressed by the average values of the groups of factors listed in Table 1 (C_i , W_i , V_i , E_i , T_i and M_i).

From the point of view of reliability testing, the test is used in the form of Cronbach alpha, i.e. the coefficient of internal consistency, which is used in statistics to assess the scale's reliability, thereby eliminating unsatisfactory variables. Furthermore, this test aims to check whether the variables measure a common concept. In other words, it can control whether respondents answer seriously or casually. According to Cronbach (2007), a variable must meet the following two criteria, or it is excluded: Total correlation must be greater than or equal to 0.3, and Cronbach α must be greater than or equal to 0.6.

Table 2 Correlation coefficients and Cronbach alphas

Groups of variables	Label	Cronbach α	Average Correl
Compensation	C	0.7937	0.3907
Working environ. Values	W	0.8093	0.4143
Employment	V	0.7818	0.3739
Training	E	0.7914	0.3873
Management	T	0.7718	0.3604
Loyalty	M	0.7720	0.3608
	L	0.7467	0.3294

As shown in the Table 2 above, all values of Cronbach's α exceed the value of 0.6. At the same time, the total correlations are demonstrably higher than 0.3, which means that both conditions, according to Cronbach (2007), are met, and we can call the answers reliable.

We will use the environment of the R program to calculate the Pearson correlation coefficient. In all cases, the p-value was lower than $\alpha=0.05$, so all correlations can be considered statistically significant.

Table 3 Pearson correlation coefficients

Relationship	Pearson correlation
L < C	0.4486
L < W	0.3883
L < V	0.4179
L < E	0.4382
L < T	0.5872
L < M	0.5043

It can be seen from Table 3 above that the dependence between the explained variable and the explanatory variables is moderate and positive in most cases, which is a logically correct situation based on the nature of the questionnaire questions. A positive correlation means that with an improvement in conditions, and thus also in results, employee loyalty will increase. Based on these results, factor T, i.e. training, has the greatest influence on loyalty.

In the data of Table 4, we can see that the third factor of agreement with the company's values has a p-value of 0.94923 and therefore exceeds the value of the significance level $\alpha=0.05$, which means that we cannot mark it as statistically significant.

Table 4 Initial model of linear regression

Variable	Beta coef.	p-value	VIF
C	0.353868	1.324404 ***	1.259402
W	0.233467	0.01559 *	1.443015
V	0.005229	0.94923	1.335161

E	0.247566	0.00220 **	1.502897
T	0.310629	2.31e-05 ***	1.609799
M	0.164278	0.03643 *	1.259402

So, based on the data in Table 4, we can reject hypothesis H3, and thus the congruence of company and business values does not significantly impact employee loyalty. We can also confirm this statement based on a logical view of the data obtained from the questionnaire. Thus, hypotheses H1, H2, H4, H5 and H6 can be accepted, which means that the factors of compensation, work environment, job fit, training and promotion, and leadership influence employee loyalty.

After eliminating the third factor V, we get the following estimate of the linear regression model:

Table 5 Linear regression after eliminating factor V

Variable	Beta coef.	p-value	VIF
C	0.35447	8.79e-06 ***	1.304764
W	0.23453	0.01330 *	1.220669
E	0.24867	0.00157 **	1.271376
T	0.31110	1.89e-05 ***	1.486249
M	0.16531	0.03081 *	1.539916

With these results and all p-values below the $\alpha=0.05$ significance levels and VIF values, i.e. the variance inflation factor, below 10, we can label these factors as independent variables suitable for a multiple linear regression model. So our model has the following form:

$$Li = 0.35447 * Ci + 0.23453 * Wi + 0.24867 * Ei + 0.3111 * Ti + 0.16531 * Mi + \epsilon_i$$

The F-test is used to check the appropriateness of the multiple regression analysis. Its P-value is $2.2e-16 < 0.05$, so multiple regression analysis is appropriate. The adjusted R^2 is 0.5754, which means that 57.5% of the variation in the dependent variable is affected by the independent variables.

From the given data, the greatest influence (*ceteris paribus*) on loyalty is the reward factor, with a regression coefficient value of 0.354447, closely followed by the training and career advancement factor, with a regression value of 0.3111. Then, in the medium values, the factors of work environment and job match with regression values of 0.24867 and 0.23453. The last and weakest is the leadership factor, which is half as weak as the most significant factor (coefficient 0.16531). Overall, all values of beta coefficients are positive, which means that our factors are increasing functions. In other words, when the company wants to increase the value of loyalty, it must focus primarily on the factors of reward and training and progress, which, if they grow, loyalty will also grow and vice versa.

5 Conclusion

Personnel loyalty is an important factor in all business sectors and activities. The question of how to keep competent employees in today's highly competitive environment appears increasingly as the price of work rises. Thus the value of loyalty also rises for employees. The subject of our investigation is employees of companies active in the gambling industry, confronted with a highly competitive environment at the workforce level. The amount of competition is often limited in this sector under the conditions of the Slovak Republic. However, the workforce is also limited because learning a new employee costs financial and time resources. Therefore, the study examines individual factors that affect employee loyalty in this sector. The research uses quantitative methods to test the hypotheses drawn up based on the review literature. Based on these hypotheses, the data from the questionnaire survey are subsequently collected from employees working in gambling industry companies. The analysis is carried out with the help of R program and spreadsheet model to determine mutual links. Research results show five factors influencing employee loyalty in this industry: compensation, work environment, job fit, training and development, and leadership. The research also indicated how individual factors influence loyalty. Based on this,

company managers in this area can adjust management strategies for workforce sustainability.

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MAPPING CURRENT STATE IN THE FIELD OF PREDICTION METHODS OF BUSINESS AND ECONOMIC CHARACTERISTICS ACROSS INDUSTRIES

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Abstract: The results of the prediction of business and economic characteristics provide valuable information to stakeholders (business owners and managers, investors, and shareholders). The aim of the paper is to provide a comprehensive overview on methods applied in practice for predicting significant business and economic variables. The research is structured into selected key industries for most of the world's economies. An extensive literary review of the scientific papers published over the last decade revealed that the most used prediction methods include ANN, GARCH combined with ARIMA. These are the methods strong enough to capture the specifics of the industries for the economic and business prediction purposes. The LS-SVM and ARIMA methods are used separately to a lesser extent. The other methods were used mainly for the purpose of validation of their predicting applicability.

Keywords: Prediction, business and economic characteristics, prediction methods, biggest industries

1 Introduction

Reviewing, monitoring, inspecting and predicting are important tasks for management when evaluating the past and the prospects of enterprises. The concept of predictive models emerges as a very important issue both in practice and research studies. Prediction of values or a state is a challenging task, which might be impossible in some cases to reach. In terms of predicting business and economic variables, this refers mainly to predicting specific numerical values which, based on the subsequent analysis, enables to deduce specific conclusions/state. Several methods and models have been developed over the years, which are applicable provided that specified conditions are met; such methods enable predicting a value or a state with a certain degree of probability. Business and economic variables must be predicted regarding internal and external factors that fundamentally affect them.

For example, a value of shares can be affected by the situation on the financial market at a specific moment, which can be caused by different factors, such as the development in the value of precious metals, the change in exchange rates, etc. (Jeong & Kim, 2019). Recent impact of the COVID - 19 pandemic or the current Russia-Ukraine conflict are the prime examples of external factors whose ultimate impact on the share price is very difficult to predict (Sansa, 2020).

The outputs of prediction methods provide users with signals for business activities, measures to mitigate the negative effects of business cycles, the orientation of foreign trade, etc. Economic forecasts are the most problematic area in economic decision-making. In the first half of the 20th century, the main support was the analysis of past developments and estimates of the configuration of future factors (Brozyna et al., 2016). Later, the use of neural networks and data mining methods were added to the most frequently used quantitative methods (Scardapane & Wang, 2017). Currently, forecasts are influenced by methods based on fuzzy propositional logic, which allow reflecting the knowledge and experience of managers and economic experts (Ikram & Qamar, 2015).

The aim of the paper is to provide a comprehensive overview on prediction methods applied in practice for predicting significant business and economic characteristics in financial markets with a focus on currency exchange markets and precious metals markets, agriculture, transport, automotive and energy industry, and manufacturing enterprises. The procedure by clustering the prediction methods according to industries is made with the intention to find out the method/methods that are strong enough to capture the specifics of industries in the view of purposes for economic and business prediction.

2 Materials and Methods

Web of Science and SCOPUS databases of scientific articles published over the last decade are used to achieve the aim of the paper. The method of our research is a biblio-metric analysis of scientific articles with the aim to map the use of prediction methods to determine business and economic characteristics. The prediction methods are divided according to the specific industries they have been used. The monitored sectors are financial markets, exchange rates, precious metals, agriculture, transport, automotive, energy industry and manufacturing enterprises.

Furthermore, the analysis of the development trend of the most utilized predictive methods for estimating the future state of business and economic characteristics across sectors is carried out. The achieved results are presented by means of summary tables for better clarity.

3 Literary research

Literary research provides overview of prediction methods that were used by authors in the key sectors of economy, i.e., in the sector of financial markets, agriculture, transport, automotive and energy industry and manufacturing enterprises. The issue of predictions is being addressed by investors, analysts, and the academic community. The "quality" of the prediction accuracy is based on the selection of the correct "prediction tool". The most used methods successfully verified in practice are presented in the text below. According to Klieštík et al. (2021) earnings management is the most important topic in the field of financial management of a company. Managing the earnings of companies has a great impact on the accounting data of companies and subsequently can bring distorted results after applying prediction models to significant business and economic characteristics. Zenzerović (2010) has already dealt with the prediction of financial risks in several sectors.

3.1 Financial markets

Financial markets represent an environment that calls for predicting the development of prices, as evidenced by numerous publications listed in Web of Science. Price development of shares represents a subject, within which the prices prediction with a high degree of accuracy is valuable information for all stakeholders in the market. Gungor & Luger (2021) deal with the predictions of higher earnings per share. They used a model combining regression t-statistics and Monte Carlo resampling techniques to control error rate in resulting predictions. In the last decade, the financial sector has been using prediction methods based on artificial neural networks (ANN). Such methods work with clusters of input data based on which they predict further development of a target variable. In the issue of predicting stock prices using ANN, Wang et al. (2021) used bidirectional long-short term memory neural network (also referred to as BiLSTM). Chen (2019) deals with the prediction of continuous sustainability of businesses in relation to the development of capital markets; the predictive model was a decision tree (DT), specifically classification and regression model. The data tested were selected using the method of gradual regression and data mining using the artificial neural networks. It was found that the method of gradual regression for data selection combined with the classification and regression decision tree shows the best predictive ability. Zhang et al. (2021) use the method of Long Short-Term Memory Networks (LSTM) for the prediction of the development of stock prices. Compared to ANN, LSTM are more suitable for processing and predicting the development of non-linear and non-stationary numeric time series. Numeric time series may contain specific economic values, but might also include specific economic indicators, such as indexes, ratios, etc. LSTM can be supplemented by other indexes, such as price and volume

indexes, which further improve its predictive ability. Based on training, LSTM can predict the sequence of other related events based on past events. Sadorsky (2021) states that the prediction of a specific value of stocks is a difficult task that is not practically possible to reach due to a large number of variables affecting their future price. Therefore, the author recommends limiting the prediction of stock prices to the prediction of the future trend of its development (upward or downward) using ANN. McMillan (2019) examines stock market predictions based on historical data on dividend payment. As dividends are paid at longer intervals than the value of stocks changes, this model shows a poor ability to make short-term stock prices predictions. In this respect, it is recommendable to use predictive models based on historical data of the average stock prices. It is thus a trend search method. According to Basak et al. (2019), the improved predictive ability of a model enables minimizing the investment risk. To predict stock price development, the authors recommend the method of random forest (RF) and DT boosted by the algorithm XGBoost (eXtreme Gradient Boosting) based on DT, which increases the speed and performance of these methods. Dai & Zhu (2019) focus on improving the predictive ability of specific methods by combining them. To predict the development of the capital market, they combined the method of sum-of-the-parts (SOP) and Ensemble Empirical Mode Decomposition (EEMD). Based on the results achieved, this combination appears to be a successful predictive tool. Ni & Xu (2021) developed a hybrid model of DCDNN (Dynamically convergent differential neural network) based on the model of RDNN (recurrent deep neural network) and DCC-GARCH (Dynamic conditional correlation generalized autoregressive conditional heteroskedasticity model), which combines both these models. To predict the development of stock market, Zhang et al. (2020) recommend the application of the model Support Vector Regression (SVR-ENANFIS) combined with ensemble adaptive neuro-fuzzy inference system of vector regression. Combining these two methods enables to make predictions of the stock market development in the long term, but only with a certain degree of probability and accuracy.

Almost all predictive methods deal with the issue of the frequency of the input data that need to be used to estimate future values. The goal is to achieve the highest possible accuracy for the longest time horizon possible. This issue was addressed by Lyocsa et al. (2021) in monitoring the development of stock prices based on the comparison of high-frequency and low-frequency data. The statistical testing of both datasets showed that high-frequency data can provide more accurate predictions only for a short period of time – the period of the coming month at most. For longer periods of time, the predictive models based on the low-frequency and high-frequency data show the same accuracy. Further on, the authors state that the selection of the data depends on the intention of researchers.

Due to the progress in the field of IT, the development of the state of financial markets can be predicted and evaluated using the combination of financial services and IT (the so-called FINTECH). FINTECH itself can be referred to as a new industrial framework (Knewton & Rosenbaum, 2020). The use of FINTECH by institutions operating in the field of financial markets was discussed by Dwivedi et al. (2021). FINTECH is an excellent tool for collecting large volumes of data, which can then be analyzed. In this case, the use of a combination of artificial intelligence (AI) and machine learning (ML) is directly offered. Based on AI and ML, the development of financial data can subsequently be predicted, including the behavior of individual market participants (Nguyen et al., 2022). By means of ML, the solvency of borrowers can also be predicted based on data obtained through FINTECH (Kriebel & Stitz, 2022).

3.1.1 Exchange rates

The prediction of the exchange rates is an important part of analyses in financial markets. Exchange rates change depending on many external and internal factors. Therefore, it is difficult to predict their development with a high degree of accuracy. Due to their volatility, it is desirable to estimate their change at least

several days in advance. Sun et al. (2018) argue that internal and external factors, which are usually turbulent in nature, can be partially included as a variable within the use of ANN or Least squares-Support vector machine (LS-SVM) for the prediction of the exchange rate. In terms of the performance of the predictive model LS-SVM is considered to be a more efficient short-term predictor. According to Babu & Reddy (2014), the predictive ability of ANN can be improved by its combination with the ARIMA (Auto regressive integrated moving average) model. Furthermore, the authors point out that the hybrid predictive model can be used in many segments of financial market, e.g., for predicting the stock prices. The hybrid predictive model application was further tested on financial and non-financial data based on the time series (the development of energy prices, the occurrence of sunspots). Using the so-called Wavelet Neural Network (WNN) it was possible to identify and map the relationships between the factors affecting the development of exchange rates that help to improve the predictive power of ANN (Bekiros & Marcellino, 2013). In terms of predicting the development of exchange rates Abedin et al. (2021) propose the application of deep learning, which integrates the regression of Bagging Ridge (BR) with Bi-directional Long Short-Term Memory (Bi-LSTM). This resulted in the method of Bi-LSTM BR, which showed a higher prediction accuracy. Rehman et al. (2014) used the model of Recurrent Cartesian Genetic Programming evolved Artificial Neural Network (RCGPANN); they showed that this model can predict exchange rates with up to 98.872% accuracy. Sevim et al. (2014) addressed early warnings about the upcoming currency crisis. They used ANN, DT and the LR model. As the dependent variable the financial stress index was used, as the independent variable 32 macroeconomic indicators were set. According to their results, the model is able to predict a currency crisis one year in advance with up to 95% accuracy. Pandey et al. (2018) recommend the BN artificial neural network training for predicting exchange rates using ANN advocating that this method can achieve better prediction accuracy.

As data on current exchange rates are available on many cloud storages Lin et al. (2013) proposed their use as data sources for predicting further development of prices in currency markets. For this purpose, they developed an Intelligent Prediction System (IPS). Premanode & Toumazou (2013) formulated a new algorithm – Empirical Mode Decomposition (EMD), which serves to improve the prediction of exchange rates based on supporting vector regression. This algorithm is able to smooth and reduce noise, while the model of supporting vector regression with a filtered dataset improves the prediction of exchange rates. The advantages of the application of the Kalman filter (KF) for the spot exchange rate prediction is addressed by Fronckova & Prazak (2020), whose analysis confirmed the model's good predictive ability.

3.1.2 Precious metals

Precious metals have the status of a long-term store of value and are thus a frequent choice of investors. Most often investors target their investments in gold, silver, palladium, and platinum. Bouri et al. (2021) examined the volatility of gold using the model of Heterogeneous Autoregressive realized Variance (HAR-RV), which works with high-frequency data. The prediction of precious metal volatility was also addressed by Naeem et al. (2019). Based on their conclusions, the model of Markov-switching GARCH (MSGARCH) can be used for predicting the volatility of all types of precious metals. Their analysis showed a high prediction of the model accuracy. Demiralay & Ulusov (2014) predict the values of four main types of precious metals (gold, silver, platinum, and palladium) using non-linear long-term memory volatility models, namely fractionally integrated generalized autoregressive conditional heteroscedastic model (FIGARCH), fractionally integrated asymmetric power autoregressive conditional heteroscedastic model (FIAPARCH) and hyperbolic generalized autoregressive conditional heteroscedastic model (HYGARCH) under normal and Student's t-distribution of the data. Long-term memory volatility models within Student's t-distribution of the data work

well for the prediction of the development of precious metals' value for the next day. Ranganai & Kubheka (2016) examined the development of platinum and palladium value using models based on long-term memory, which were the models of FIGARCH, autoregressive fractionally integrated moving average (ARFIMA)-FIGARCH, ARFIMA-FIAPARCH, and ARFI-MA-HYGARCH.

Gaspareniene et al. (2018) analyzed the technical possibilities of predicting the prices of gold using the ARIMA predictive model. They confirm that this model is only suitable for predicting the development of the price of gold in the short term, specifically, in the one-year horizon. The development of the price of gold is closely related to the development of the price of other commodities. Chandar et al. (2016) predicted the development of the value of gold based on the development of the values of silver, oil, S&P500, and ex-change rates. The prediction model used was the multilayer neural network Extreme Learning Machine (ELM). This type of artificial neural network shows better performance than other types of artificial neural networks due to its good ability to learn. El-Rashidy (2021) points out that the value of gold can fluctuate within very short time intervals (5, 10, 15, 30, and 60 minutes). For these short periods, the value can be predicted using the wrapper selection method (WSM) combined with ANN and genetic algorithm (GA). Brabenec et al. (2020) used five methods of time series smoothing to the value of gold prediction, namely ANN, DT, gradient boosted tree (GBT), LR, and the nearest neighbor method. These methods enabled the authors to estimate the development of the price of gold for the next calendar year.

3.2 Agriculture

Agriculture is focused on food production, animal husbandry, and soil cultivation. The volumes of production represent important indicators of each country's economic development. Therefore, the choice of the right prediction methods to estimate the development of economic characteristics in this industry is an essential part of planning and budgeting. The prediction of possible financial distress of companies operating in agriculture is addressed, e.g., by Klepáč & Hampel (2017). Analyses showed that the best results were achieved using the method of logistic regression (LR), Support vector machines (SVM) RBF ANOVA core, DT, and Adaptive boosting based on DT. The prediction accuracy of all these models decreases with the growing distance from bankruptcy. DT and Adaptive boosting enable higher accuracy for stress prediction compared to the methods of SVM and logit. A traditional method of predicting bankruptcy is Altmann Z-Score developed in 1968. Boda & Uradnec (2019) compared Altmann Z-Score with the CH-index (Chrastinova's index) and G-index (Guroik's index) in a sample of agricultural companies operating in Slovakia. Comparing the two models mentioned above, Altmann Z-Score is considered to be a more modern predicting method of possible bankruptcy, G-index enables the same results despite its obsolescence. According to Almamy et al. (2016), the predictive power of Z-Score is different when used for the prediction of the development of agricultural companies in various countries. Therefore, a modified model of Z-Score was developed for agricultural companies in Great Britain, which considers the cash flow of the company in the calculation. The modified model is called J-UK Model; according to the current tests, it achieves the same accuracy results as the Taffler's model. Bai et al. (2019) state that bankruptcy and monitoring of sustainable economic stability of agricultural companies can be predicted using fuzzy theory and fuzzy c-means. Liu & Wu (2018) used the same method for the bankruptcy prediction of agricultural companies. They determined that bankruptcy can be estimated by the methods of LR, DT, ANN, and supporting vector network. Huang et al. (2015) add that financial failure can be predicted using the data envelope analysis. They also demonstrated the use of an improved method integrating the super-efficiency of data envelope analysis. This method excludes the evaluated data envelope analysis from the reference set; efficient data envelope analyses may have an efficiency score higher or equal to 1. It is also able to generate more meaningful correlations and measure

central trends in an empirical application with more effective units for which such units would achieve the same score otherwise (Avkiran, 2011). In the case of agriculture, seasonal fluctuations should be taken into account. The fluctuations may negatively affect the accuracy of the predictive models that are not able to consider them. Chen et al. (2020) used the Gray Seasonal Model (GSM) for accurate estimations of seasonal fluctuations in the observed sequence and obtaining better-predicted values. The results of their study show that the accuracy obtained is relatively high. The authors thus state that the GSM method is generally becoming a new method to be used for seasonal data prediction.

3.3 Transport

Transport is related to a large volume of data of both economic and non-economic nature. According to Zhou et al. (2015), the economic parameters of a business can be predicted using the method of data mining (DM). Brozyna et al. (2016) used classic linear discriminant analysis (LDA) and LR to predict the bankruptcy of businesses operating in the transport sector. They also applied predictive models based on classification trees and the nearest neighbor method. Based on the statistical verification, it can be stated that these predictive models show high prediction accuracy. In the case of the lack of accounting data, which represents the input information for predicting the development of a business over time, it is possible to use probability models (PM) (Kuhi, et al. 2015). Weytjens et al. (2021) recommend the use of classical predictive methods, ARIMA and Face-book Prophet (FP) for predicting cash flows in transport companies. Wang et al. (2017) use BNN (Bayesian Neural Networks) for the possible bankruptcy of transport companies' prediction; they point out that due to its predictive power this method should be included as the standard indicator of the financial health of transport and other companies.

Bankruptcy risk in the transport sector poses a big risk of disrupting the capability of international trade. For predicting the possible bankruptcy of airlines, Mathani & Garg (2018) suggested using the multi-criteria decision making (MCDM) method based on the fuzzy AHP (Fuzzy Analytical Hierarchical Processing). Sedláčková & Švecová (2019) analyzed the risk of airline bankruptcy utilizing the specific bankruptcy and solvency models IN05 and Kralicek's Q-test (Q-Test).

3.4 Automotive

The ZEW market sentiment indicator (ZEW index) can be used as a model for predicting the development in the automotive sector. The ZEW index provides more accurate predictions if used on a complex model of tested data. This indicator can be used to predict the upcoming bankruptcy of automobile companies three months ahead (Homolka & Pavelková, 2018). In automotive, various models of machine learning (ML) are applied to optimize the costs of production. They mainly include the application of vector regression (VR), optimized supporting vector regression (OSVR) (using a genetic algorithm), the methods of RF and EGB, and the method of deep learning (El Mazgualdi et al., 2020). In terms of making decisions to reduce the product failure rate, a decision support system (DSS) is used (Unver et al., 2020). Lessmann & Voss (2017) examined the usage of predictive models to determine the selling prices of used cars. They found that when predicting the selling price of this product, it is necessary to avoid LR and apply RF instead. In contrast, Zainudin et al. (2021) argue otherwise. According to the authors, it is necessary to apply regression models to estimate specific variables that have a major impact on the generation of revenues. For this purpose, Panel Regression Analysis (PRA) was used.

Automotive, as well as other sectors, see the importance of sales and turnover. In the automotive sector, it may refer to selling automobiles as final products as well as specific spare parts and components. Türkbayragi et al. (2022) predicted the development of selling spare parts and components using ANN and multiple linear regression (MLR). Sangasoongsong et al.

(2012) identified specific economic ratios whose values change in dependence on the volume of sales. This was achieved utilizing the vector error correction model (VECM). Selling automotive spare parts is also dealt with dismantling companies. For these companies, the prediction of demand for older dismantled automobile spare parts is of great importance. According to Czwarda et al. (2019), the future demand for spare parts can be predicted using the method of market prediction. For demand prediction of dismantled automobile spare parts Modified Croston's method (MCM), which is based on Holt's double exponential smoothing was used by Altay et al. (2008). Kosacka et al. (2016) added that dismantling companies represent a large part of enterprises operating in the automotive sector. For such companies, the key issue is usually to determine a bid price for a specific dismantled spare part. For this purpose, they developed a tool to set bid prices on the basis of the business process model and notation diagram (BPMN) and Unified Modelling Language (UML).

3.5 Energy industry

The predictive ability is highly important for energy companies so that they can respond to the upcoming changes in industrial structures well in advance. Kerhel & Sick (2014) dealt with the evaluation of economic and technological predictive competencies of German energy companies. Their results indicate that large energy providers make high-quality economic predictions; however, they are less able to make valid predictions in terms of renewable resources due to the current unstable political frameworks. Companies using renewable energy resources do not have to face these difficulties but show lower accuracy of economic predictions. The energy industry and its development significantly influence other manufacturing and non-manufacturing sectors. Zheng et al. (2018) dealt with the prediction of the capital intensity of the energy industry. Based on the Cobb-Douglas production function, they created a model of the capital and labor force indicator at the level of industry and subsequently modified it by implementing the method of estimating and predicting of non-linear grey Bernoulli model (NGBM). This model can be applied even in the case of a sudden transformation of the energy industry. Scalzer et al. (2019) argue that possible financial distress of energy companies can be predicted by specific financial ratios. Specifically, ROE, immediate liquidity (IL), and current liquidity (CR) were identified as the best predictors. Angilella & Pappalardo (2021) dealt with predicting the possible bankruptcy of energy companies using a non-parametric model for multi-criteria decision-making (MDCA), a model of Multi-group Hierarchy Discriminant (M.H.DIS) utilizing the application of a better MCDA approach, specifically Preference Ranking Organization Method for Enrichment Evaluations (PROMETHEE II).

As for wind energy, its sustainability requires correct and professional prediction of the development of investment safety in real-time. Yan & Hong (2021) thus present a predictive model based on combining Grey relational analysis based on the technique for order preference by similarity to an ideal solution (GRA-TOPSIS) and a modified bat algorithm with weighted least squares support vector machine (MBA-WLSSVM). Rotela et al. (2019) use the predictive model of Monte Carlo and ANN to identify variables that most affect the development of investments in the projects of wind power plants over time.

3.6 Manufacturing enterprises

Manufacturing enterprises represent one of the largest sectors in many countries. Their activities affect many other aspects, such as the environment, employment rate, GDP development, etc. In many sectors, significant business and economic characteristics are predicted based on large datasets. Yadegaridehkordi et al. (2019) dealt with the possibility of using large datasets containing accounting data of manufacturing companies for predicting their performance using the method of Decision-making trial and Evaluation laboratory (DEMATEL) - Adaptive neuro-fuzzy inference systems (ANFIS).

Javaid & Javid (2018) tested the predictive ability to go concern models in creditor-oriented manufacturing companies. As the first step, they performed the analysis of standard bankruptcy and liquidity models, which was followed by their revision. As the second step, a going concern prediction model was developed using multiple discriminant analysis (MDA). Based on the results achieved, the MDA predictive model appears to be a reliable model for predicting the going concern principle of a company.

Ferencek et al. (2020) point out that manufacturing companies must have sufficient financial reserves to be able to resolve possible customer complaints concerning their products under guarantee, whose repair is paid for by the company. The authors state that for the needs of manufacturing companies, prediction methods based on the simulation of discrete events and time series and predictive models of machine learning were used in the past to determine the necessary financial reserves. They thus extend the range of applicable prediction methods with a set of predictive models of deep learning (ANN). Klepáč & Hampel (2018) deal with a bankruptcy prediction of manufacturing companies. For this purpose, they recommend the SVM method with spline core, hyperbolic tangent, and RBF ANOVA, DT, and RF.

Csiksova et al. (2019) emphasize the need to combine predictive models, especially the older ones since the accuracy of the models gets worse due to the development of the economic environment. The models include Altman Z-Score, Taffler's index, Springate model, and IN index, which are based on multidimensional discriminant analysis.

4 Summary tables

A comprehensive overview of the models that were and have been used for predicting the development of values/status in the examined sectors is presented in Table 1.

Table 1: Overview of models and methods used for predicting business and economic characteristics in a specific field

Research field	Predictive model and method used	Source	Year
Financial markets	t-test, Monte Carlo	Gungor & Luger	2021
	ANN-BiLSTM	Wang et al.	2021
	Classification and regression DT	Chen	2019
	LSTM	Zhang et al.	2021
	ANN	Sadorsky	2021
	RF, DT+XGBoost	Basak et al.	2019
	SOP+EEMD	Dai & Zhu	2019
	DCDNN	Ni & Xu	2021
	SVR-ENAFIS	Zhang et al.	2020
	AI, ML	Nguyen et al.	2022
Exchange rates	LS-SVM and ANN	Sun et al.	2018
	ANN+ARIMA	Babu & Reddy	2014
	WNN	Bekiros & Marcellino	2013
	Bi-LSTM BR	Abedin et al.	2021
	RCGPANN	Rehman et al.	2014
	ANN, DT and LR	Sevim et al.	2014
	BN	Pandey et al.	2018
	IPS	Lin et al.	2013
	EMD	Premanode & Toumazou	2013
	KF	Frončková & Pražák	2020
Precious metals	HAR-RV	Bouri et al.	2021
	MSGARCH	Naem et al.	2019
	FIGARCH, FIAPARCH and HYGARCH	Demiralay & Ulusov	2014
	FIGARCH, ARFIMA-FIEGARCH, ARFIMA-FIAPARCH and ARFIMA-HYGARCH	Ranganai & Kubheka	2016
	ARIMA	Gasparyniene et al.	2018
	ELM	Chandar et al.	2016
	WSM+ANN+GA	El-Rashidy	2021
	ANN, DT, GBT, LR and Nearest Neighbor	Brabec et al.	2020
	LR, SVM+RBF ANOVA, DT, Adaptive boosting based on DT	Klepáč & Hampel	2017
	CH-index, G-index	Boda & Uradnicek	2019
J-UK Model	Alama et al.	2015	
Fuzzy c-means	Bai et al.	2019	
Fuzzy c-means	Liu & Wu	2018	

	GSM	Chen et al.	2020
Transport	DM	Zhou et al.	2015
	PM	Kuhi et al.	2015
	ARIMA and FP	Weytjens et al.	2021
	BNN	Wang et al.	2017
	LDA and LR	Brozyna et al.	2016
	MDCM/Fuzzy AHP	Mathani & Garg	2018
	IN05 and Q-Test	Sedláčková & Švecová	2019
Automotive	ZEW index	Homolka & Pavelková	2018
	ML, VR, OSVR, RF and EGB	El Mazgualdi et al.	2020
	DSS	Unver et al.	2020
	RF	Lessmann & Voss	2017
	PRA	Zainudin et al.	2021
	ANN and MLR	Türkbayragi et al.	2022
	VECM	Sa-ngasongsong et al.	2012
	Prediction markets	Czwajda et al.	2019
	MCM	Altay et al.	2008
	BPMN and UML	Kosacka et al.	2016
Energy industry	HGBM	Zheng et al.	2018
	ROA, IL, CR	Scalzer et al.	2019
	MCDM, M.H.DIS and PROMETHEE II	Angilella & Pappalardo	2021
	GRA-TOPSIS and MBA-WLSSVM	Yan & Hong	2021
	Monte Carlo and ANN	Roleta et al.	2019
Manufacturing companies	DEMATEL-ANFIS	Yadegaridehkordi et al.	2019
	MDA	Javaid & Javid	2018
	ANN	Ferencek et al.	2020
	SVM	Klepáč & Hampel	2018

Source: Authors.

Table 1 shows that many predictive models have been used in all fields under review. The literary research revealed models' repetition in specific areas. The most frequently used prediction method is ANN, which has been applied 16 times in total. The second most frequently used model is GARCH; together with its other combination with the ARIMA model, it has been applied 8 times. This method is followed by DT, which has been applied 5 times. Other methods, that should be mentioned, include LS-SVM and ARIMA, which, for the purpose of the prediction, have been applied 3 times. It is also obvious that various authors tried to apply the other prediction methods, but only randomly in order to find out whether these methods could be used for prediction purposes.

Subsequently, the results of the bibliometric analysis were arranged ascending according to the publication year in order to reveal the development trend of the most utilized models and methods to determine business and economic characteristics across sectors. The results are presented in Table 2.

Table 2: Overview of the most utilized models and methods used for predicting business and economic characteristics across sectors

Predictive model and method used	Year
MCM	2008
VECM	2012
WNN	2013
IPS	2013
EMD	2013
ANN+ARIMA	2014
ANN, DT and LR	2014
FIGARCH, FIAPARCH and HYGARCH	2014
FIGARCH, ARFIMA-FIEGARCH, ARFIMA-FIAPARCH and ARFIMA-HYGARCH	2016
LR, SVM+RBF ANOVA, DT, Adaptive boosting based on DT	2017
LS-SVM and ANN	2018
ARIMA	2018
Classification and regression DT	2019
RF, DT+XGBoost	2019
MSGARCH	2019
Monte Carlo and ANN	2019
ANN, DT, GBT, LR and Nearest Neighbor	2020
ANN	2020
ANN-BiLSTM	2021
ANN	2021
WSM+ANN+GA	2021
ARIMA and FP	2021
AI, ML	2022
ANN and MLR	2022

Source: Authors.

From Table 2 we can see that in the first decade of 2020 the predictive models were used, which required large interventions on the part of their users and, from this point of view, were more

demanding. Over time, in hand with the development in the field of IT, the predictive models based on sophisticated procedures of artificial intelligence (mainly ANN) have been increasingly used. These models proved to be able to provide the user with accurate predictions of the business and economic characteristics, regardless of the industry in which they are used. Moreover, they proved to be user-friendly.

5 Conclusions

In many economic areas, several models are used to predict business and economic variables. The aim of the paper was to provide a comprehensive overview of prediction methods published over the last decade in scientific papers. Specifically, the authors dealt with the applicability of predictive models in the financial markets with a focus on the currency markets and precious metal markets, of the companies operating in agriculture, transport, automotive, energy industry, and manufacturing companies.

In terms of the development of financial markets, currency markets, and precious metal markets, the most frequently applied method is the ANN; this method is intended for non-linear time series prediction, which corresponds with the situation in these markets. We found that in the other sectors under review some authors, dealing with the issue of predictions, try to prove the applicability of selected models. In general, the most frequently used methods for the prediction of business and economic characteristics are ANN and GARCH combined with ARIMA; the models LS-SVM and ARIMA are used to a lesser extent. These are the methods strong enough to capture the specifics of the industries for economic and business prediction purposes. The use of ANN-based predictive methods and its hybrid versions was made possible by large and increasingly rapid developments in the field of IT.

Further research will be focused on the verification of the application of not often applied methods (e.g., fuzzy approach) in predicting specific economic and business characteristics. The following research into ANN-based prediction methods could increase awareness of these sophisticated prediction methods within industries and their use for future analyses.

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HUMAN RESOURCE PRACTICE TYPES BEING FOLLOWED IN INDIAN ENTREPRENEURIAL ORGANIZATIONS WITH FOCUS ON SUCCESSION PLANNING PROCESS

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Abstract: The primary aim of this study has been to examine the Human Resource (HR) Practice types which are being followed in various Indian Entrepreneurial Organizations with special focus on succession planning process. HR Practices provide a common understanding and order within the system. It is also a very important part of an organizations business strategy since people are working for an organization and creating a great enterprise heavily relies on how well and fairly, they are being treated. Additionally, organisations require a plan for creating, disseminating, and enforcing a set of rules and regulations that are compliant with the law and represent the proper conduct of their employees. Sound HR Practices also support the vision, mission and business strategy of an Organization. At the operational level of HR function, it helps HR Professionals to deliver in an objective way. This paper provides insights, as to the status of types of HR Practices being followed in Indian Entrepreneurial Organizations. It would help organizations to improve their HR practices. This paper also tests the relevance of influence of organization types on HR practices especially Succession Planning

Keywords: HRM Types; Human Resource Practices; Followed; Indian; Entrepreneurial Organization.

1 Introduction

Success in today's competitive market and especially in twenty first century largely depends upon the HR practices being followed by various organizations. These practices are in turn governed by factors such as a company's size (the number of people), sector (if it is a government, commercial, or nonprofit enterprise), and profit growth (profit Vs non-profit organization) (Dirar et al. – 2015). Also, most essential determinant elements that influence Human Resource Management (Top management places a high priority on HRM procedures which are accompanied by the structure of the firm and its strategic planning. Government policy, together with changes in the national economy and industry characteristics, are the external factors that have the biggest an impact on HRM practices. (Tahemina – 2017). Organizations in India are increasingly trying to compete internationally by meeting relevant criteria. In respect of outcome emphasis, long-term plans, consumer focus, initiative, and various attitudes for international and domestic consumers, the new global order calls for a new emphasis. The historical constraints that are mostly the result of centrally planned economy define the Indian market landscape.

To adapt to the environment effectively, the categorisation of businesses or corporate entities can take many different forms. India therefore acknowledges many enterprise categories. The following criteria are based on the forms that are now visible, although they acknowledge that no such categorisation is ever comprehensive:

- i) According to size: (a) Small businesses (b) other businesses
- ii) Based on the number of members: (a) one-person businesses (b) private corporations. (c) Public companies
- iii) The following categories are ranked according to control: owning corporations, subsidiaries, and affiliate firms.
- iv) Based on liability, there are three options: a) Restricted (I) by Stocks (II) by Assurance (with or with no equity capital); b) Unbound.
- v) a) Listed corporations; b) Unlisted enterprises, based on the method of financing options (<http://www.mca.gov.in/>).

The HR possesses qualities that present both the considerable difficulty and potential. A company's HR works in area of fragile with delicate relationships, its contributions are now, measurable and tangible. Additionally, it delivers essential inputs like individual expertise (excellence, workforce, and people), organisational leadership, and management capacity

(culture, workplace, systems) (Dave Ulrich – 2018 in a LinkedIn post), among others, to an organization. Thus, HR is one of the most important parts of an organization which facilitates in achieving the organizational goals by way of Strategic HR activities, such as hiring and choosing, managing performance, paying employees, providing training and development, managing careers, etc. (Manjari et al. – 2011). Also, the targeted competence and Hr outcomes are compatible. For instance, collaboration among different makes it possible for a company to more successfully combine its efforts in recruiting, development, communication, remuneration, and work design around the skills they are attempting to offer. (Dave Ulrich et al.-2008).

HR practices too varies from organization to organization and there is bound to be variation in practices between various types of organization, be it family or non-family run business organization. Not only this, even for same practice, there is bound to be variation in the degree of a practice being followed and it too may vary from organization to organization.

HR Practice basically includes, manpower planning, recruitment and selection, performance appraisal, internal communication, career planning, training and development, Strategic alignment, performance – based compensation, promotions based on merit, design HR policies and practices, career management, rewards & recognition, compensation; job description; organizational surveys etc. HR practices get impacted by the type or nature of organization. In other terms, there is also an impact on culture because of the role of the organizations founder (Edgar H. Schein – 1983) which in turn impacts the nature of HR practices.

To meet the purpose of this research, the definition of Entrepreneurial Organizations is restricted to family owned and / or individual-controlled firms, founded by individuals. The entrepreneur recognized and pursued an opportunity which may or may not be passed on to the next generation of family members. These individuals have ventured into business creating niche and unique position for themselves. Their initial investments might be on their own or with Capital support from their families running separate businesses.

This study's objective is to look at the HR procedures used by various types of Indian Entrepreneurial Organizations. This paper also tests the relevance of influence of organization types on HR practices especially Succession Planning.

2 Literature Review

Review of literature includes research in the area, as elaborated in the introduction part. The material related to literature review has been taken from various sources.

2.1 Entrepreneurial Organizations

Family-owned firms continue to be the foundation of the majority of national economies, according to a review of the literature by Angela (2018) on the link between planning, family business succession, entrepreneurial intention, and firm performance of small and medium-sized enterprises. Only one in three family companies prosper in passing down to the next generation, however, due to the shaky ownership structure that characterises the majority of them. These smaller firms need to think about a suitable succession plan since they are more susceptible to the effects of unforeseen, life-changing events that impact the company owner and frequently the business itself.

Alacia et al. (2016) conducted a thorough analysis of the entrepreneurship literature and concluded that there is no

established information method to gauge an individual's preparedness for entrepreneurship.

Ruiz et al. (2016) described an individual's readiness for opportunity recognition as the combination of a number of personal characteristics that makes them particularly capable of observing and analysing their environment in a way that channels their high productive and creative potential, allowing them to use their capacity for daring and necessity for self-achievement.

Mokhber et al. (2015) conducted a research to look at how employee inventive self-efficacy affected the link between entrepreneurial leadership and the need for innovation in the firm. This study offered data that may help business owners and their teams find more chances, create more of them, and take advantage of them in a manner that makes the company more open to innovation.

Vidar et al. (2013) conducted research to come to the conclusion that business owners should balance their companies, for example by recruiting practises, to avoid excessive overconfidence, optimism, or scepticism becoming the norm within the workplace.

2.2 Managing a growing business, enterprise growth and succession

Varadraj et al. (2019) conducted research on family businesses, which are among the oldest and most common types of organisations in the world. In India, families control 85% of the businesses and/or manage them, which accounts for 2/3 of the country's GDP. The two main strategies for ensuring the continuation of a family business are efficient strategic planning and creativity to create a competitive edge. The interaction between parental inheritance and creativity is objectively examined in this work utilising a case study methodology. It has been discovered that family succession and innovation are positively correlated, meaning that the involvement of original members of the family in the ownership and/or management of the firm has a beneficial impact on the family companies' propensity for innovation. The research results add to the body of knowledge on innovation and succession planning in family businesses.

In order to comprehend the relationship between leadership succession in family-owned enterprises and its effects on family-owned firms, Sunil et al. (2019) conducted a research. This research aids in identifying the future plans of the successors that a family business should take into account while preparing before the actual succession of the firm. This essay also makes an effort to explain the succession process in Indian family companies and to quantify the effect that succession has had on these enterprises.

In order to comprehend the steps, the Godrej Group had taken to achieve an effective and efficient transfer to its fourth generation, Reena (2017) researched the management succession in this largest and longest family-owned Indian conglomerate. Finding answers to queries like, "Did the family discuss business matters in the family forums?" was the goal. What was the procedure for integrating the family's youngsters into the business? Were the current leaders reluctant to step down? What different steps made up succession management? Has the decision of the incumbent for the successor been influenced by considerations like gender, birthrights, and preference? The study discovered that the establishment candidates and veterans of the Godrej Group started the success management process more than ten years ago, gave both daughters and sons an equal chance to prove their worth, and made objective decisions as they passed the responsibility and authority to the following generation.

Parimal et al. (2017) conducted research on the procedure of induction, which prepares the next generation's members to join the family company. This essay aims to examine how three

crucial elements—the "quality of relationships," "willingness of the inductee," and "the capacity to handle conflicts harmoniously"—relate to the induction procedure and the development of the company. The conclusion is that a beneficial influence on work, family, and the induction depends largely on the nature of relationships, the inductee's desire to participate, and the capacity of both the inductor and the inductee to handle and resolve conflicts.

Nalin Jain (2016) undertook research study on Succession in Indian Family Owned Enterprises. The most prevalent kind of economic structure is family-owned business enterprises (FOBEs). A large percentage of FOBEs are micro, small, or medium-sized businesses (MSM-FOBEs). Typically, a single owner-manager, partners, and/or family members own and operate the MSM-FOBE. The study, which provides the first review of the succession procedures in Indian MSM-FOBEs, produces a wealth of important and useful results for all parties involved. Based on the findings, targeted actions and activities by corporate, social, and family business entities are advised.

Ghee et al. (2015) conducted a research to review several aspects that affect the profitability of family businesses by looking at succession problems and transitional experiences faced by succeeding generations. The results demonstrate that family company performance levels are highly influenced by management styles, connections within the family, values and beliefs, and succession training. It is discovered that succession experience fully mediates and succession difficulties somewhat mediates the link between antecedents and company performance.

Dhamija et al. (2013) created a framework to analyse the strategy used by small and medium-sized businesses (SMEs). This methodology took into account how internal as well as external factors affected the growth patterns of SMEs and can assist the sector in empirically evaluating company growth patterns under various circumstances.

Schröder et al. (2013) conducted a qualitative research using a motivational lens to look at how young people with a family business background improve their careers. The research shows that parental career-specific behaviours are important in the early stages of career and succession planning in family businesses.

Bhattacharya (2012) concluded through his study that family-owned enterprises are the biggest wealth creators and generators worldwide, including in India. This paper focuses on the challenges in family owned business.

Subramanian et al. (2011) researched how Chennai-based IT businesses use succession planning and how it affects organisational performance. According to the study, there is a positive correlation between organisational performance and succession planning, with the mean proportion of both factors being higher in IT consulting organisations.

Tracey et al. (2010) studied as to how new organizational forms are created in new institutional theory. They presented a model that bridging institutional entrepreneurship, which entails integrating elements of recognised institutional logics to produce a new kind of organisation supported by a novel, hybrid logic, is a significant method through which new organisational forms develop. The approach emphasises how institutional activity is done at the micro, meso, and macro levels, demonstrating how bridging institutional entrepreneurship is multilayered. The research explores the link between institutional processes at the individual, organisational, and societal levels as well as the association of entrepreneurship and institutional enterprise.

Bansal (2010) focuses on the strategic move of many Indian companies. It entails a wide range of benefits and advantages of proactive Succession Planning.

Nandagopal et al. (2008) conducted a qualitative case study on family-owned companies (FOBs) and discovered that their failure to maintain strong family leadership through generations is their basic issue. Many Indian family enterprises have survived more than two or three generations, with only a few exceptions.

Saxena (2008) did a qualitative study note that cohesion as well as splits in business groups potentially have some favorable and unfavorable consequences. The study reveals that there is automatic change due to changing environmental conditions.

Singh et al. (2007) studied how the conflict might affect company value and the maintenance of effective business processes. This research includes the concept of two brothers' splits and their performance afterward.

Talreja (2007) did quantitative research on the pattern of succession plans and firm 's performance (ROA) i.e. Effects of Successions on Indian Family Firm Performance. While splits increase performance of the firm less than no splits, disputes between heirs over succession boost performance of the firm more than experiencing no fights.

Raveendra et al. (2007) investigated the effects of succession to a nonfamily professional manager as opposed to a family member, — often referred to as professionalisation of management, based on inductive reasoning, case evidence from Indian family business groups, and the researchers' perspective with family businesses in India. Professionalisation of a family business is a voyage from pure family firms to organisations managed by and through professionals (Mishra, Shukla, & Sujatha, 2021). Between family-owned and family-managed enterprises and family-owned and professionally run firms, an essential difference is made. The essay makes recommendations about the effects of management professionalisation on succession performance.

2.3 HR Roles and HR practices in Entrepreneurial Organizations

Sweety et al. (2019) did an investigative study on Innovative Human Resource Practices in Indian Banks. Additionally, in recent years, business-related desires have become more apparent. In order to increase the representative profitability, it is necessary to develop the banks' previous HR procedures. With regard to human resource management, this essay aims to explain such developments. These innovative HRM rehearsals have been documented under seven different HRM headings, including recruitment and selection, training and development, executive execution and compensation, career promotion, employee motivation, and representative security. It has been revealed that combining the methods of innovative HR departments would help banks become more competitive.

Jaeyoon et al. (2018) carried out research into the relative significance of human resource practices for loyalty and turnover intention. The findings showed that, among observed HR policies and practices, internal migration had the most correlation with desire to leave. Additionally, the link between perceived HR practices, affective commitment, and turnover intention was mediated by positive affect, and it was greater for people who reported high positive affect compared to those who reported low positive affect.

Arun et al. (2017) did a focused study on the adoption of various human resource practices adopted by the Hotels in the NCR (National Capital Region). Depending on the management and amenities, there is a significant variation in the procedures used by the hotels. The majority of hotels recognise the value of human resource management techniques to better performance but unable to adopt human resource management practices due to high turnover and firm demographic characteristics. The human resource management practices have great influence on different, especially on performance and quality improvement.

Sonia et al. (2017) conducted a research on staff retention practices in a few Indian IT businesses. The management can stop rivals from luring and stealing the talent that has been developed within the organisation over time by putting HR best practices into place. In order to have a complete grasp of the guiding principles of these HR best practices, a thorough assessment of the literature is conducted before this research paper investigates and records HR best practices in employee retention in specific Indian IT firms.

Upasna et al. (2015) conducted an exploratory research on human resource practices in Indian SMEs spanning recruiting, training, performance management, and remuneration across the HR value chain. Effective human resource management strategies have a big impact on how well a business performs. SMEs are very informally managed and the employer's and employee's obligations to each other are implicit and based on trust. This informality in the SMEs and close personal relations between employees and employer raises interesting questions about the psychological contract between the SME owners and the employees making it a unique.

Purendra (2015) conducted study on modern human resource practices at a few selected firms in the Indian cement sector. Any firm that adopts human resource management (HRM) procedures sees an increase in employee loyalty. HRM methods thereby improve organisational performance. Managing human resources is far more difficult than managing technology or money, and organisations need strong HRM systems to manage them effectively. Sound HRM practices may support an HRM system. Human resource management (HRM) procedures are actions taken by an organisation to manage its human resource pool and make sure that those resources are put to use in achieving its objectives.

Joseph et al. (2015) He conducted research on the connection between employee retention and emerging human resource practices in Indian organisations. Using two comparison HR practices and Intention to Stay, the empirical study investigates the effect of evolving HR practices in Indian firms on Employee Retention. The researcher created a measure to assess HR procedures and employee retention intentions after reviewing previous research in this area. The findings showed that HR policies have a significant impact on employee retention and are connected to employees' intentions to stay.

Gomes et al. (2015) He conducted a comparison of Indian and European multinational corporations' global human resources management strategies (MNEs). They argued that Indian multinational corporations utilise more temporary workers than their European counterparts, have greater labour expenditures as a percentage of overall sales, and make fewer investments in employee training. Their research demonstrates that when country-of-origin effects conflict with host country ideologies, they are diminished and that as economies develop, so do people's expectations for HR policy and practices.

Beha et al. (2013) He carried research on the subject of organisational performance and best practices for human resource management from a global viewpoint. They discovered that implementing HRM best practices improves business performance. The study discovered a favourable association between organisational performance and SHRM alignment in the organisation, internal communication, career planning, training and development, recruiting, and selection. The study's findings indicate that HRM is essential in service businesses and that performance assessment procedures are widely used in the insurance industry.

Budhwar (2012) He conducted research on the administration of human resources in international companies operating in India, paying particular attention to the function of HR in regional headquarters (CSHQs). The type of HR function, the services offered, the strategy employed by the HR department, and the learning that is taking place concerning HR management in the Indian CSHQS are among his findings. There is a significant

amount of latitude from the corporate headquarters of MNCs to create and put into effect HR policies and procedures. It is discovered that the CSHQS is essential for the development and distribution of learning about HR.

Mathew et al. (2012) undertook a survey of a poll of HR experts about HRM innovations made by Indian and foreign MNCs operating in India. Their findings showed that Western corporations and their Indian counterparts saw advances in human resources management differently. In international MNCs, parent subsidiary alignments are prioritised more than in Indian MNCs, who place less of an emphasis on this topic. The Indian MNCs have used creative culture-building strategies and are obviously concentrating for the time being on controlling performance from inside. Foreign MNCs, on the other hand, are concentrated on maintaining the harmony between the parent and subsidiary and standardising the HRMI procedures throughout diverse worldwide regions. Additionally, foreign MNCs frequently pay greater attention to cost and performance considerations than do Indian MNCs. According to Mishra, Shukla and Sujatha (2021), whether new ideas and innovation are pursued to be advanced within the subsidiary in the host country or to be cascaded down to the entire network of the MNC by the parent company would be contingent on the setting and situation of each case.

Sadun et al. (2012) studied Management Practices across Organizations and Countries. Utilizing trials to determine causation, they employed a straightforward technique to quantify some fundamental elements of management practices across industries and nations. Variations in management methods are a key factor in explaining these significant productivity gaps between firms and nations.

Tiwari (2012) carried out an exhaustive analysis of HRM procedures. They discovered that firms need to adopt cutting-edge HRM methods in order to manage human resources efficiently. One crucial consideration that must be made while developing and putting into effect such practices is that HRM procedures need to be periodically reviewed and modified. Additionally, they created a normative framework that demonstrates how HRM practices affect company performance in general.

Kuldeep Singh (2010) He investigated how Indian organisations' performance was impacted by their use of human resources strategies. The findings demonstrated that all of the firms that took part in the study are utilising the HR practices that were the subject of the investigation. Except for information sharing, the percentage of employees who are covered by each HR practice is low across all firms. This suggests that businesses in India are still unsure about the link between investing in human resources and improved performance. Additionally, it has been noted that there are variations in how HR practices are applied across different organisations. This variation lends credence to the idea that the adoption of HR practices depends on the particular needs of each organisation. Four specific HR practices—performance-based pay, information sharing, merit-based hiring and promotion—were also strongly associated with all metrics of objective organisation success.

Pawan et al. (2010) In the New Indian Economic Environment, he investigated new trends in HRM. According to their research, which was based on the material that was accessible, the Indian HRM system(s) are less formal and less organised than those in Western nations, albeit the difference is closing quickly. According to a study, innovative Indian firms actively implement specific high-commitment/performance HRM methods to complement their corporate goals. The Indian environment still generally lacks a research culture. To foster and harness employee creativity, organisations must increase the strategic importance of the HR function, build their HR competency, and establish HR practices and policies that work for them.

Singh (2010) He conducted research on organisational culture and HRM practices at a few private sector organisations in India. He discovered that there is a strong relationship between HRM procedures and company culture. Organizational culture (self-realization, status enhancement, innovative values, and socioeconomic support) and HRM methods (specifically planning, recruiting, selection, training and development, performance assessment, career management, and incentives) were considerably beneficial. According to research on culture, an individual's values are a major factor in how well they fit into the setting of their business.

McPherson (2008) He investigated the HRM procedures and frameworks used by South Asian small firms. There was a clear lack of compliance brought on by a weak HRM system. Because formal/adhoc methods required more time and money, there was a gap between HR operations and activities.

Pawan et al. (2008) researched how indigenous realities affect how Indian SMEs manage their human resources. Their research revealed that indigenous methods of addressing personnel issues in SMEs are given overall precedence. Depending on the social and cultural contexts in which they function, many indigenous activities become organised in them through time. Indian SMEs' owners believe that the absence of organised procedures aids in cost-cutting and provides the required inherent flexibility. At some point, they come to believe that by being unofficial, they can compete on price in the new Indian economic climate.

Alpay et al. (2008) He researched the effects of institutionalisation on performance in family-run firms. They discovered that, of the institutionalisation elements, transparency had the greatest impact on both the quantitative and qualitative performance of the organisation, whereas adaptability only had an impact on the latter. Family harmony boosted institutionalisation attempts while democratic decision-making boosted flexibility.

Shahnawaz et al. (2006) He conducted research on organisational commitment and human resource management practices in various organisations. They discovered that, with the exception of training and development, two firms varied considerably on the key HRM aspects. In both groups, the same types of variables contributed to the formation of various levels of commitment. HRM practices were significantly predicting organizational commitment.

Uhlener et al. (2005) He researched the best HRM practises in family-run businesses. According to a study, family-owned or managed businesses are less likely to employ best practises in HRM. They have created a model that examines the direct and indirect impacts of family organisation traits on the utilisation of expert HRM techniques.

Wright et al. (2005) analysed the causal chain connecting HR practises to organisational performance. The study demonstrated that making any causal inferences should be done with caution because HR practices are closely connected to both past and future success.

Singh (2003) studied Strategic HR orientation and organization performance in India. According to his findings, it is important for firms to strategically match their HR policies and practices with their business strategies in order to maintain the competence level that they have built up.

Sparrow et al. (1997) did mapping that compares the Indian HRM recipe to global patterns. His mapping revealed that the current Indian profile and those of other nations had essentially no correlation. A "cultural island" is India. In actuality, there is a stark contrast between Indian and British HRM recipes, with a substantial negative association between them. It is quite similar to that of Japan in many ways.

3 Methodology

The study used both descriptive and exploratory research design to explore and understand types of HR Practices Being Followed in Indian Entrepreneurial Organizations. All the papers that have been printed in reputable HR journals for a decade until 2020 were scanned using the key words, Types; Human Resource Practices; Followed; Indian; Entrepreneurial Organization. In the process, close to 1000 literatures were reviewed. Out of these, 52 are there with the context of current study. Papers pertaining to HR Practices Being Followed in Various Types of Indian Entrepreneurial Organizations were scrutinized in detail. The papers were qualitatively categorised based on a few chosen dimensions. This made it possible to conduct a comprehensive study and investigate new angles and topics that the literature at the time had not sufficiently addressed. The summary is well-structured, representing the most important and important components.

Further, diagnostic survey methods involving questionnaire of 43 different entrepreneurial organizations was also undertaken and they all requested anonymity. The majority of these businesses have been operating for at least ten years, some much longer. The businesses covered a variety of industries, comprising IT, Infrastructure, Automobile Manufacturing, Consulting, Education etc. Many of them are leaders in their industry. They were selected from private sector, entrepreneurial organizations. All of them were administered questionnaire through on-line mode. These were administered to top management and Heads of HR of these Organizations. Data were then analyzed, and quantitative data were processed to provide support to qualitative analysis.

In the course of analyses, the following research problems were addressed:

- Types of HR Practices
- Which HR Practices are being followed in the Entrepreneurial Organizations?
- What are Entrepreneurial Organizations?
 - Characteristics of an entrepreneurial organization
 - Preparedness of Entrepreneur with regards to development of successors
 - Preparedness of HR with regards to development of successors
 - Preparedness on part of Successors with regards to their development
 - Organizational strategies with regards to succession planning

4 Analysis and Discussion

Succession Planning in Indian Organizations is one of the most important and integral functions of Strategic HR, yet it remains hidden. Organizations spend time, financials and other resources on Succession Planning to ensure that there is a right person for the right role at the right time. However, organizations still fail to establish a proper system at leadership level. Even today very rarely do Indian Entrepreneurial Organizations plan succession for leadership roles. The study reflects on the importance of identifying a potential successor, and training and positioning him.

It was determined that just one in three family enterprises succeed in passing down to the second generation due to the flimsy ownership structure of the majority of family firms. These smaller firms need to think about proper succession since they are more susceptible to the effects of unforeseen, life-changing events that impact both the company owner and frequently the business itself. (Angela - 2018).

It was revealed that no precise information tool exists to assess people's preparedness for entrepreneurship. (Alacia et al. - 2016).

Individuals' readiness for entrepreneurship has been defined as the combination of a number of personal qualities that make them particularly adept at observing and analysing their surroundings in a way that allows them to unleash their high innovative and productive potential in order to use their capacity for risk-taking and need for self-actualization. (Ruiz et al. - 2016).

This study provided evidence that might help entrepreneurs and their businesses find and seize more opportunities and take advantage of them in ways that make the company more open to innovation. (Mokhber et al. - 2015).

It was concluded that Enterprises should regulate their businesses to avoid extreme overconfidence, optimism, or skepticism establishing a prevailing corporate culture. One way to achieve this is through recruiting practices. (Vidar et al. - 2013).

Building a long-term strategy to drive and manage family business growth involves many aspects, like, Transformation, Risk and Regulations. The operational demands of running a family business or other closely held enterprise can be all-consuming, but it's vital that Entrepreneur's take the time needed to assess their organization's business succession planning. The long-term survival of a business, and the preservation of the wealth that has been built, will likely depend on getting ahead of those changes through strategic succession planning. For private, owner-managed, or family-owned businesses, a solid succession plan can drive the growth of the business and set the stage for succession Family-run businesses may benefit further by focusing on preserving harmony within the family.

It was concluded that Two essential strategies for ensuring family businesses survive are good succession planning and innovation to obtain a competitive edge. The involvement of founding members of the family in the ownership and/or administration of the business is reported to have a positive link with innovation, i.e., it influences the family enterprises' propensity for innovation in a favourable way. (Varadraj et al. - 2019).

It was concluded that before there is really a business succession, a family business should plan ahead and take into account the successor's future strategy, which also indicates the size of the post-succession impact on enterprises. (Sunil et al. (2019).

It was concluded that The Godrej Group's current leaders and seasoned veterans initiated the process of achieve accurate more than ten years ago, gave both daughters and sons an equal chance to show themselves, and made objective decisions while transferring the task and duty to the following generation. (Reena - 2017).

To summarise, relationship quality, the inductee's desire to participate, and their shared ability to deal with and manage conflicts all have a significant influence on how well business, family, and the inductee will go. (Parimal et al. - 2017)

The study concluded that for in Indian Family Owned Enterprises, the majority of micro, small, and medium-sized businesses (MSM-FOBEs) are owned and run by a single owner-manager, partners, or family members. Focused initiatives and activities by business, social and family business institutions are recommended. (Nalin Jain - 2016).

The results demonstrate that family company performance levels are highly influenced by management styles, connections within the family, values and beliefs, and succession training. It is discovered that succession experience fully mediates and succession difficulties somewhat mediates the link between antecedents and company performance. (Ghee et al. - 2015).

The paradigm offered might assist the sector in empirically examining firm growth trends under various circumstances. (Dhamija et al. - 2013).

It concluded that cohesion as well as splits in business groups potentially have some favorable and unfavorable consequences and there is automatic change due to changing environmental conditions (Saxena – 2008).

It concluded that splits increase performance of the firm a little under having no splits, but disputes over succession amongst heirs boost performance of the firm further than possessing no disputes. (Talreja - 2007).

Different researchers have taken different variables as best practices for measuring firm's performance. Performance Appraisal; Internal Communication; Strategic HRM alignment in the organization & Career Planning (Loo-See Beha and Leap-Han Looa - 2013). Sales per employee; profitability; the growth of sales & Survival (Nicholas Bloom Christos Genakos Raffaella Sadun John Van Reenen - 2012). In Indian context, Impact of strategic HR orientation; size; age; research and development (R&D) expenditure and unionization (Kuldeep Singh - 2003). Selection; performance appraisal; compensation; job description; career planning; information sharing; organizational surveys; employee participation; training; and promotions and rewards have a bearing on firm performance (Kuldeep Singh – 2010). The percentage of annual employee turnover of the firm, including both voluntary and involuntary quits; Sales per employee; Accounting measures, price-cost margin (PCM), return on capital employed (RCE) and RoNW (return on net worth) are measures of firm's productivity (Kuldeep Singh – 2010). HR practices and performance; Organizational culture impacts a firm's performance (Patrick M. Wright, Timothy M. Gardner, Lisa M. Moynihan, Mathew R. Allen - 2005).

It was concluded that there is Innovation in Human Resource Management Practices by Indian and Foreign Multi-National Companies operating in India in contrast to practices followed in other countries based on inputs of HR Professionals (Harish Jain, Mary Mathew & Akanksha Bedi – 2012).

It was concluded that in India, aspects of human resource management practices such as employee attitude, employee-employer relations, financial performance, and staff productivity are all directly or indirectly impacted by both internal and external influences. (Pankaj Tewari – 2012).

HRM procedures at a family-owned business are influenced by factors including HRM specialty, formal business plans, firm age, industry, franchising, and the proportion of unionised personnel. (Jan M. P. de Kok, Lorraine M. Uhlaner, and A. Roy Thurik – 2005).

It was concluded that, Organizational age, size, and environmental uncertainty impact a firm's performance in a family owned business (Gu' ven Alpay, Muzaffer Bodur, Cengiz Yilmaz, Saadet C, etinkaya, Lac, in Arkan - 2008).

Planning, recruitment, selection, performance review, training and development, career management, and rewards were found to have an influence on corporate culture. (Anil Kumar Singh – 2010). Organizational commitment is influenced by self-investment, general education, social support (from supervisors, coworkers, spouses, parents, and friends), and opportunity. (M.G. Shahnawaz, Rakesh C. Juyal – 2006).

5 Conclusion & Scope for Future

The review of literatures reveals very limited research studies with specific reference to types of HR Practices Being Followed in Indian Entrepreneurial Organizations with focus on succession planning process. This is because in Indian context, business types vary in classification from being Sole Proprietorship; Partnership Organization; Private Limited

Company; Public Limited Company; Limited Liability Partnership companies etc.

The tendency towards incorporating traditional HR functions into a strategic human resource management has been observed to be growing function because of higher focus of organizations towards outside customers.

The available literatures have reported that the Comparing Indian HRM systems to those in Western nations, one can see that formers are less organised and formal. This gap exists because HR transactional tasks and compliances are given more attention.

Studies show that in order to support their long-term business plan, Indian firms that value innovation employ certain high-commitment / performance-related HRM policies on purpose.

Research culture is still largely missing in the Indian environment. To foster and harness employee creativity, organisations must increase the strategic importance of the HR function, build their HR competency, and establish HR practices and policies that work for them.

The present HR procedures in India and those in other nations are unrelated. India is a 'cultural island' with varied traditions. HR practices therefore have an innovation and impact of local culture and traditions.

It also sets a conceptual background on the topic for further research. Future research can be undertaken in multiple directions, of which the following may be considered:

- Comparing family and non-family businesses in Succession Planning.
- This study was restricted, other regions across the country may be included.
- Effect of different cultures on succession planning.
- Culture & Succession
- Leadership Characteristics for Succession Planning.

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Primary Paper Section: A

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HUMAN RESOURCE MANAGEMENT IN WORK-LIFE BALANCE ISSUES IN THE CONTEXT OF COVID-19 PANDEMIC: AN INTERPRETATIVE PHENOMENOLOGICAL ANALYSIS

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Abstract: This study investigates the employee productivity experience of the business managers from CEE countries with the worldwide home-office phenomenon in the context of the global COVID-19 pandemic. Qualitative method with an exploratory approach is used, especially a phenomenological design was adopted for this study. Through Interpretative Phenomenological Analysis (IPA), the specific experience of managers was examined and subsequently an effort was made to understand the situation. Findings explain that working from home has provided advantages and disadvantages for organizations as an essential part of sustainable human resource management. The interviews showed that it is possible to manage and evaluate employees according to their performance, not according to attendance at the workplace, and that their productivity has not declined significantly. However, this current situation offers a unique vision of the pros and cons of working from home and may play a vital role in future strategies that will reshape the existing structure of working hours, possibly allowing for more flexibility.

Keywords: Human resource management, work-life balance, Covid-19 pandemic, interpretative phenomenological analysis

1 Introduction

The whole world is currently facing the consequences of a coronavirus pandemic in various areas. Its spread significantly affects the economy and companies face serious problems. On the downside, companies tend to cut costs and keep operations at least under certain conditions and survive, but many have had to lay off some employees, and some have ended up altogether. As far as consumers are concerned, their priorities have changed significantly. However, some of the changes that have taken place in relation to Covid-19 may be positive in some ways – such as the digitization of businesses and the growth of online work. Businesses that previously could not imagine it now allow their employees to work from home (WFH), e-commerce is experiencing a huge boom, video conferencing is used in meetings, etc. Recent studies about the effects of work from home adoption on work productivity in the context of the pandemic have been published (Mendes et al., 2020).

It is currently work from home or home office that is a very common term in connection with the situation associated with the spread of coronavirus, not only in the media, in everyday interpersonal communication, but also in professional contributions of lawyers and other experts on this issue. The contributions focus on various aspects that are associated with work from home, i.e. the possibility of control of the employee by the employer, reimbursement of employee costs associated with work from home, health and safety at work, communication security and data protection, etc. The above components are part of the personnel policy of the employer and at the same time fall into the area of social performance, specifically into the area of work-life balance. Work from home began to expand along with the development of information and communication technologies, and in the past it was provided to employees more as one of the benefits offered. Everything changed with the time of coronavirus, which made the home office a standard and used affair. Whether or not the home office suits employees is a question, given that one is a social creature and needs to see others and communicate tasks or projects live, this style of work may be unsatisfactory for some groups of employees as their productivity deteriorates, work ethic and concentration. For others, however, commuting to work or, for example, effective harmonization of house-hold care is eliminated. Most companies say that home office is the style of work of the future and they are already preparing for the offices to be vacated and employees will not return to them (Lippe, 2019; Talib et al., 2017).

The WFH practices have been employed widely, as can be seen in the U.S., where studies show in May 2020, 35.2% of the

workforce worked from home, an increase from 8.2% in February. Furthermore, 71.7% of workers that WFH found that they could work effectively (Bick et al., 2020).

Systematic/research literature review was used for collection theoretical data focusing on their quality using the Primo database, which is a unified search interface that allows you to search most of the information sources available within the Brno University of Technology, including full-fledged databases (e.g. Web of Science or Statista). Several links were used to search, which are based on the topic of this article and as can be seen in the number of reviewed articles, the area of human capital, Covid-19, human resource management is still a topic for discussion. Here are the number of articles on the topic or link: human resource management: 124.069, social performance: 23.053, Covid-19: 5.346, work-life balance: 30.890, Covid-19 and social performance: 8, work-life balance and Covid-19: 44.

The aim of this paper was to understand the impacts that working from home (one part of work-life balance) during the COVID-19 quarantine period had on the human resource management conflict, from the managerial view.

2 Literature review

At present, a company's survival depends not only on money competitiveness, it is equally important for organizations to be able to prove their worth position vis-à-vis the various stakeholders that are activities affected by the business. In other words, it is a fact that companies are facing a growing one pressure their surroundings to act in a socially responsible way (Bučiūnienė, Kazlauskaitė, 2012).

The performance of any organization is largely related to the quality of delivery products and services that are significantly affected by the social climate in the organization. For sustainable business, the company should focus on the long-term profitability while maintaining suitable conditions not only for today's life, but also for the life of future generations. Therefore, society must pay due attention not only economic side, but also other aspects – environmental protection, health and safety at work and social responsibility. Businesses that do not care about the inclusion of socially responsible behavior (i.e. are not socially responsible) into their strategies, systems and procedures, likely to lag behind the competition. Increasingly, customers, employees, stakeholders, investors, government, business partners and society chooses not to support societies that have little interest in the planet and happy life of its inhabitants. Being social responsible business also brings a number of benefits, including: reduction operating costs, increase corporate image and improve reputation, increase customer loyalty and sales at the same time (Boyd, Gessner, 2013; Blowfield, Murray, 2008).

For the definition of social performance can be used states of Spriig (2006), who understands this concept as "social impacts on stakeholders". Social impact is perceived as the result of social activities and behavior of the company and stakeholders can be considered as customers, employees, government agencies, the media, suppliers, NGOs, etc. In general, it is possible to identify social performance for human resources in relation to liability.

Social responsibility should therefore be a part of the corporate strategy as it expresses voluntary commitment of the company, contributing to a better society. Socially responsible businesses are characterized by a pro-active, not just a reactive policy, as their management actively applies new and positive trends (Boyd, Gessner, 2013). Over the past few decades, corporate social responsibility (CSR) activities have become increasingly essential to a firm's performance activities. Prior literature has defined CSR as a set of voluntary corporate actions beyond legal

requirements designed to improve social conditions and social goods (Choo, Lee, 2019; McWilliams, Siegel, 2001; Mackey et al., 2007). Thus, it is necessary to introduce sustainability as a concept associated with the long-term maintenance of systems, taking into account economic, social, and environmental aspects (Crane, Matten, 2010; Freitas et al., 2013; Jabbour, Santos, 2008; Parente, Fischer, 2014).

2.1 Sustainable human resource management

The concept of Sustainable Human Resource Management is the result of linking the concept of sustainable development with human resource management in an organization (Mazur, Walczyna, 2020). According to Ehnert and Harry (2012) "HRM could play a vital role in implementing a sustainability mindset in business organizations". And Ehnert (2009) also states that sustainable management of human resources means undertaking such activities that enable achieving the organization's goals in the long term and demonstrate care for the employees at the same time.

As we can see, results of the literature review indicate that Sustainable HRM plays a significant and positive role in achieving organizational out-comes. Moreover, via the strength of the HRM system, it exerts an additional impact upon employees and external stakeholders (Karman, 2020).

Sustainable HRM practices enhance profit maximization for the organization and at the same time reduce the negative influence on employees, their families, and communities (Karman, 2020). Sustainable HRM is beneficial for the organization and for the employees, but it also positively affects other stakeholder groups. The general effect Sustainable HRM has on the society as a whole can be characterized as a contribution to the activities of the societies. Sustainable HRM incorporates activities directed towards improving communities and neighborhoods. Additionally, it al-lows creating sustainable career pathways for the younger generations to become transitional on the job market and secure a better future (Scavarda, 2019).

Sustainable HRM supports the organization's sustainable expansion strategy, cares for the development, health, and well-being of employees, supports environmentally friendly organizational practices, assumes the development of employees' competences, and promotes work-life balance. Moreover, it relates to the social performance that contributes to the long-term development of the organization, that is, to a sustainable organization. At the same time, sustainable human capital management allows for the maximum work efficiency, taking into account the well-being of not only employees but also other participants of the organization. Maintaining a balance between work and life for employees not only improves the quality of personal life, but also creates a competitive advantage for a company and promotes continuous growth (Mikolajczyk, 2021). The implementation of the concept of a sustainable organization in the area of human capital management draws attention to the need to achieve not only the economic goals of the enterprise, but also meeting and balancing the needs of employees (Mikolajczyk, 2021).

2.2 Work-life balance

Work life balance is a concept that encourages employees to find a balance between spending time at work and spending time with other activities. The term work-life balance first appeared in the 1970s in the United States and initially referred to various family-related initiatives. This was linked to the crisis of the male breadwinner model as a result of the massive entry of women into the labor market. Starting from the 1990s, this term refers to initiatives aimed at providing support in the field of balancing professional and non-professional roles for all employees, regardless of their family situation (Harris, Foster, 2008).

Work-life balance is directly related to social sustainability. Sustainable development of human capital is a complex concept

that covers the areas of human activity on many levels of human life, both on a micro and macroeconomic scale (Ferreira, 2020).

The essence of work-life balance is defined in the literature as the subject of focusing attention on maintaining balance between work and private life, thus allowing the individual to strive for self-fulfillment in non-work aspects of life while maintaining understanding of the multidimensionality of the situation (Kaliath, 2008).

Consequently, companies undertake various activities to improve positive empowerment and balance between personal and work life. These are activities both at the employee level (e.g., creating attractive working conditions) and the organizational level (e.g., introducing specific solutions in terms of working time and its control) as well as at the level of the entire society (e.g., providing assistance with dependent care of children or family members). One of the practical ways to achieve work-life balance is to accept that these two spheres are extremely important to a person, and that many values and other resources can permeate from one area to another. However, you should be aware that the work-personal life relationships are so complex that it is not always possible to achieve these goals (Mikolajczyk, 2021).

Employers can support work-life balance in several ways. A common helpful step is to allow partial work from home, perhaps only once a week or even monthly. Some work is performed almost exclusively externally – e.g. copywriting. Many are also helped by flexible working hours. If the nature of the job allows it, it is probably not a problem if the employee takes care of his personal affairs in the morning and engages in work duties in the afternoon or evening. So work life balance includes: Flexi-time, staggered hours, time off in lieu, compressed working hours, shift swap-ping, self-roistering, job sharing, term-time working, work from home, tele-working, breaks from home.

With the work-life balance is very often associated a concept of Work From Home (WFH). However, WFH is not new and has been brought to the attention of several schools of thought for many years. The WFH concept was initially mentioned by Nilles (1988) dating back to 1973, known as "telecommuting" or "telework" (Messenger, Gschwind, 2016; Vyas, Butakhio, 2020).

It is the subject of discussion and global study theme by researchers in the past 10 years, but this global phenomenon begins to emerge at the coming of the COVID-19 attack and becomes an alternative strategy for many organizations. Thus it is clear that WFH is a strategy for many organizations with all the advantages and disadvantages that must be received by both the organization and its employees. Flexibility, trust, life balance between work, social, and losses that must be received such as lack of trust, additional costs and also multitasking of employees who are certainly different in gender is an interesting phenomenon to be studied so that the development of the WFH concept becomes wider and contributes to increasing the productivity of human resources work in organizations (Krasulja et al., 2015).

A recent study by Dingel and Neiman (2020) uncovered that 37% of the job could be completed at home during the COVID-19 pandemic in the U.S., such as financial work, business management, professional and scientific services. Some jobs, especially those related to healthcare, farming and hospitality cannot be performed at home. Although the acceptance of WFH has increased worldwide, academics argue regarding its pros and cons.

As mentioned Uqwu et al. (2016) concern for work-life balance and the impacts of imbalance continues to gather momentum in research. There is ample confirmation that, on one hand, work-life imbalance impacts physical, mental and general health, and wellbeing (Carlson et al., 2011; Frone, 2000; Rantanen et al., 2008; Shockley, Singla, 2011) and, on the other hand, work-life

conflict undermines productivity and performance in the workplace (Zheng et al., 2015). Some studies point out that telework can decrease turnover rate and increase employees' productivity, job engagement, and job performance (Collins, Moschler, 2009; Delanoëje, Verbruggen, 2020).

Similarly, e-working can increase productivity, flexibility, job satisfaction, work-life balance, including reducing work-life conflict and commuting (Grant et al., 2019). Additionally, Purwanto et al. (2020) argued WFH could support employees in terms of flexible time to complete the work and save money for commuting to work.

3 Methodology

Data were collected through semi-structured interviews. In the context of the abovementioned theoretical premises, it seemed important research to recognize, identify, and evaluate selected human capital management practices conducive to the sustainable development of an individual. Due to the researched area and finding out the experience of managers in the balance between work and private life, it is used qualitative method with an exploratory approach, especially a phenomenological design was adopted for this study. This approach is phenomenological by trying explore a particular perception or explaining events, situations and human experience. Through Interpretative Phenomenological Analysis (IPA), the specific experience of managers was examined and subsequently an effort was made to understand the situation. IPA gives flexibility by staying open to theory and literature, but also to new ideas and clusters of meaning (Maxwell, 2005; Miner-Romanoff, 2012; Igwu et al., 2016).

The requirement for respondents was to have worked in a managerial position for a minimum of 5 years. The reason for this was that managers already have some experience (both negative and positive) with their subordinates and can therefore be a useful source of information. For this study the 10 managers (all men) were drafted, they were willing to be interviewed, but with a COVID-19 outbreak, direct interviews (face to face) were very unlikely to be done so interviews via online plat-forms were used. Each interview took approximately 30 minutes.

A semi-structured interview schedule on the basis of key themes was prepared, the most common method of data collection in this type (qualitative) of research. This approach includes a dialogue between the researcher and the participant, extended by any questions and comments. The researcher is then allowed to examine the participant's thoughts on a specific subject (DeJonckheere, Vaughn, 2019). Berg (2001) lists 4 types of questions that should be included in this type of interview guide: Essential questions are directed to the central theme of the research, can be grouped and asked at once, or can appear throughout the interview. Extra questions are questions equivalent to the core questions. They may be alternative expressions of the basic questions that the study participant did not understand in the original wording. Throw-away questions are used to build rapport at the beginning of the interview. They are used to set the pace or to change the topic during the conversation. Probing questions are designed to get respondents to elaborate on their answers to the questions asked.

The topic for interview was built for the aim of this paper – to understand the impacts that working from home (one part of work-life balance) during the COVID-19 quarantine period had on the human resource management conflict, especially from the managerial view. For interview were used these questions:

- It was common in your organization to work at a home office (HO) before the Covid-19 pandemic? How often? Did employees use this opportunity?
- What impact (positive or negative) does the current HO have on the work of your subordinates? Meaning, for example, in the following areas: morality, concentration, productivity, loyalty.

- Positive vs. negatives (advantages vs. disadvantages) HO from your point of view – within your activity?
- In the future, our organization is or is not inclined to use HO and why?

The detailed results obtained from the respondents are presented in the following chapter: Results.

4 Results

Sociodemographic profiles of the interview participants are presented in Table 1.

Table 1: Sociodemographic profiles of interview participants

Respondent	Gender	Age	Years of manager	Area
1	Male	43	7	IT
2	Male	40	6	E-commerce
3	Male	34	5	IT
4	Male	37	6	Transport
5	Male	56	10	Automotive
6	Male	43	7	IT
7	Male	58	9	Energy
8	Male	62	20	E-commerce
9	Male	39	6	Wholesale
10	Male	47	12	Automotive

Source: own processing based interviews

All survey respondents were men from management of businesses that operate in Central and East European countries. In terms of the area in which they act as managers, information technology (IT) – software services, automotive, energy, engineering and sportswear (e-commerce) were the most represented. The age of the respondents varied from 34 to 62 years old. In the field of work from home, employees have been using this form of work life balance for a year, some have not been at work for a whole year and remain at home. As regards the professional profile of participants, they are working in different industries.

In the first question, it was found that HO could be used rather exceptionally before the outbreak of the Covid-19 pandemic, employees used it to a lesser extent, it was rather an exception (e.g. once a month). Only one respondent (6) stated that it was a common matter and HO accounts for about 15% of the total working time fund. It is interesting to mention that one respondent (3) from a large international IT company states this fact:

- HO did not work at all before the pandemic, given that our corporate culture is based on personal contact. For us, the value is in meeting people.

The focus of the second question was on the impact of HO on the work of subordinates. There was a considerable discrepancy in the answers. Some respondents (2, 3, 9) stated that the productivity of their subordinates in-creased (compared to the previous situation). One of these states:

- Labor productivity, which increased by 20 % in the first months and fell to 15 % after about half a year, remains at this value to this day. One of the reasons may be that responsible and hard-working col-leagues work more than before, because, for example, they also use productively the original time spent on the way to work (respondent 10).

Another part of the managers (1, 4, 5) considers the impact of HO as neutral, or it was added that it is "without effect" due to the fact that they cannot compare the option of better working conditions at home due to the fact that currently parents also have their children at home. One respondent () added that they consider the impact to be neutral, given that both customers and suppliers are on HO. The last group (6, 7, 8) took this way of doing work as negative. Worse motivation, concentration and

productivity play a role. There are two specific answers from respondents:

- Extra time spent setting up and running the process + absence of personal contact in the office, during this situation is need to adapt to the online style of communication (respondent 7).
- Work ethic and productivity is not as it could be, we have a lot of un-necessary phone calls, loss of contact with production and testing department (respondent 1).

The summary on this topic could be the answer of the respondent (9) who also evaluates loyalty and concentration in more detail from his point of view:

- Employee loyalty affects his productivity at HO. In terms of concentration, the employee is influenced by the situation at HO. If he is in a separate room, his concentration can be compared to an office. If the employee is not in a separate room and is affected by normal home noise in the presence of small children, the concentration decreases. Morality as such is good from my point of view, only practices have changed. For example, employees take longer free time at lunchtime or suspend work in the afternoon. They work on it in the evening. So they use daylight for outdoor activities and then work out the missing hours in the dark.

The third question concerned to advantages and disadvantages of HO in general (within this "new" experience during the Covid-19 pandemic). I.e. how respondents understand them, how they take HO in the performance of their position, the current functioning of the organization, etc. Here, compared to the previous question, respondents agree mainly on one thing, when HO sees an advantage in greater flexibility and time savings (e.g. when traveling to work), or the opportunity to better plan your time according to your needs. The research stated that HO is taken by employees as a bonus provided by the employer. One of the answers due to greater flexibility was from respondent (3):

- Nowadays, employees do not have a problem meet during a conference, for example, at 17:00, which was inconceivable when they went to the office to stay in the workplace for such a long time. They also do some work early in the morning or on the weekend (when, for example, the weather is not good) and then use it during the day or another working day to relax or resolve personal matters (doctor, authorities, etc.).

Other benefits were the change to digitization, greater peace of mind and greater health security at this time. The last one is taken as the only way to keep the team functioning. This is associated with a lower rate of absence, given that the increasingly widespread "open space" workplaces carry a high risk of transmitting infectious diseases, which may result in a high absence of a large proportion of workers. But people working from home easily avoid such a risk (respondents 1, 3, 5, 7, 8, 9).

Within the disadvantages, there was also some agreement and that is mainly the impossibility of personal contact with the customer, the impossibility of spontaneous discussion of the problem (everything needs to be planned), the loss of perception of the work team, the absence of social contact and the associated greater spending time at PC (addressed at the meeting today must be "spoke" by email, communicators or teleconferencing). With regard to the focus, it was also stated that, for example, technical matters are poorly explained via Teams / Skype, etc. (respondents 2, 3, 4, 8, 10).

The last question was about the future and whether the organization plans to continue to use the established HO or whether this option is out of the question. In this case, all respondents stated that the possibility to work from home will remain, but it is not clear, yet, to what extent or how this possibility will be addressed, because now it is required mainly by employees. For the most part, however, managers were

inclined to maintain HO, but not as often as they do now. Other justifications were as follows:

- For positions where it makes sense, there is more flexibility and the ability to use people around the world (respondent 9).
- Yes, we consider a regular home office, e.g. 1-2 times a week. At the same time, however, it may mean the introduction of floating jobs, which will increase the capacity of offices (respondent 6).
- In the past, we tended to avoid HO. The reason was that no one could imagine how it could work. The pandemic has shown that it is possible. This is more often related to questions from employees as to whether it will be possible to have HO more often even after a pandemic. So we are currently working on this idea to set reasonable rules, taking into account something like a "shared workplace" in offices (respondent 2).

5 Conclusions

The current Covid-19 pandemic has consequences in many areas, not just in health issues. The aim of this article was to find out how it manifested itself in the social performance of companies, given that in the Czech Republic many employees have moved to their homes for more than a year and have used home offices more than ever. Social performance is associated primarily with the satisfaction of the company's employees. If employee satisfaction increases, they will have greater work productivity. With higher labor productivity, there will also be an increase in social performance. I.e. employers, hence managers, have to monitor and evaluate social performance because they do not currently have direct supervision over their employees. This raises the concern that when working from home, the manager does not have the opportunity to personally supervise the work attendance and performance of employees, and thus there may be a delay in teamwork.

The research identified interesting information that can help other managers in deciding whether home office and teleworking can be a strategic tool in the future within human resource management.

The interviews showed that it is possible to manage and evaluate employees according to their performance, not according to attendance at the workplace, and that their productivity has not declined significantly. Employees working from home have the opportunity to schedule their own working hours, and this can lead to the employee trying to work out the assigned tasks in less time in order to have more time for personal activities. Thus striving for a balanced work-life balance. In the field of HRM, there is a real possibility in the future of recruiting the best employees from basically all over the world, because if an employer chooses a home office for his employees, where the employer is based no longer plays a big role. He therefore has unlimited possibilities, which is a strong competitive advantage for him, because, as mentioned in the previous text, human resources are basically the most valuable item a company has. More frequent use of teleworking in the future, it is also an opportunity for organizations to save money on office operating costs, as they can build a lower-capacity location where real offices can operate in a certain hybrid mode. For companies, this is an opportunity for the future to invest these savings in the development of organization.

However, the disadvantage is the worse building of the so-called "team spirit", which is an important part of the corporate culture and helps to create a strong manager. And following it a stronger and more competitive company.

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Primary Paper Section: A

Secondary Paper Section: AE, AH

FIRST AID IN EDUCATION

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Abstract: This article aimed to analyse, through a questionnaire, teachers' knowledge and opinions regarding basic first aid. Teachers (N=382) from South Bohemia (municipalities with different populations and, with regard to the gender ratio in staff, mostly women) filled out questionnaires between 2017 and 2020. They also mentioned changes in pupils' health conditions, and these data were compared with anonymized statistical data of the Emergency Medical Service in the same region of the Czech Republic (6% of the Czech Republic's population, data from August 2018 to June 2019). One third to half of all teachers stated that some health crisis required first aid at school and/or outside school. Teachers caring for older children and adolescents report a lower incidence of cases than pre-primary teachers. Through the questionnaire survey we found (a) significant differences in the mean values of knowledge of first aid in total between all subgroups of teachers ($p < 0.05$) and (b) in the level of knowledge of first aid for traumas and acute conditions of chronic diseases ($p < 0.05$; in favour of the non-traumatic acute conditions). But overall, the level of knowledge was insufficient (mean values between 69% in pre-primary and 84% in elementary-school teachers in a standard first-aid test). Results show the importance of the inclusion of first aid in the training of teachers in pre-primary, primary, and lower and higher secondary schools. A majority of teachers feel it would be appropriate to provide training in first aid in both traumatic and non-traumatic acute conditions once every two years, predominantly using simulations.

Keywords: first aid, education, teachers, schools, trauma, acute condition, social science

1 Introduction

First pre-medical aid is defined as the first and immediate assistance given to any person with either a minor or serious illness or injury, with care provided (a) to preserve life, (b) prevent the condition from worsening (e.g. circulatory failures), or (c) to promote recovery. It includes initial intervention before professional medical help is available, such as stopping massive bleeding, helping during choking, and if necessary performing cardiopulmonary resuscitation (CPR) while waiting for an ambulance, as well as the complete treatment of minor conditions, such as applying disinfectant and a plaster to a cut. First aid is generally performed by someone with basic medical training, who must consider also his or her own safety and the safety of other people present (FAM, 2021; Kelnarová, Toufarová, Váňová, & Číková, 2012).

Any human being is always expected to provide basic assistance, especially in case of emergency. That is not just a moral obligation, but also a legal requirement, which includes calling the Emergency Medical Service (in the Czech Republic 155) for professional help (§ 150, No. 40/2009 Coll.). In addition, teachers are obliged to protect the safety and health of all pupils (§ 22b, No. 561/2004 Coll.). Also school administration has an obligation (a) to guarantee first aid to pupils and employees and (b) to educate pupils and staff about first aid (§ 102 and § 103, No. 262/2006 Coll.), although it is expressed widely as an obligation of the employer's management in relation to employees.

In the field of first-aid education, the most relevant source is the European Resuscitation Council (ERC Guidelines 2015, 2021). These guidelines are updated usually every five years and reflect the latest scientific findings in the field of first aid. Other publications and projects subsequently build on these findings (e.g. British Red Cross, 2022; Truhlář et al., 2021; SBR Project, 2022).

The aim of our research was to evaluate differences in the knowledge of first aid among subgroups of teachers. Based on the description of health conditions of children and adolescents in schools, the importance of targeted, regular first-aid training for teachers was highlighted.

2 Material and methods

The study was conducted between October 2017 and June 2020 at 85 randomly selected schools in South Bohemia (Czech Republic). Teachers were contacted personally and via email. They were informed about the objective and methodology of the study and were asked to provide express written consent to use their anonymized data.

The subgroup "Teaching children 3-7 years old" includes teachers at pre-primary schools, the subgroup "Teaching children 7-15 years old" teachers at primary and lower secondary schools (i.e. elementary schools grades 1 to 9), and the subgroup "Teaching adolescents 15-19 years old" includes teachers at higher secondary schools. Table 1 shows numbers of teachers.

Table 1: Numbers of teachers

	0-10 years*	11-20 years**	21+ years***	In total
Teaching children 3-7 years old	59	25	60	144
Teaching children 7-15 years old	38	40	50	128
Teaching adolescents 15-19 years old	38	31	41	110

Note: * Teaching 0-10 years, **Teaching 11-20 years, ***Teaching 21+ years.

Source: Authors.

The data were collected using a questionnaire in written and electronic form. The questionnaire contains questions about the first-aid procedures recommended at the time of data collection (i.e. ERC Guidelines, 2015) and questions for expressing cases with changes in health conditions and the respondent's own opinions. The anonymized data on cases that happened during school hours were collected between September 2018 and June 2019 by the Emergency Medical Service.

Fundamental statistical values (mean values and standard deviations) are presented in the tables. Our data were compared (Statistica version 12) in view of Shapiro-Wilk test results using parametric Student's t-test: $\alpha = 0.05$ ($p < 0.05$).

3 Results

3.1 Some teachers stated None with regard to a first-aid course

In our questionnaire 4 pre-primary teachers (3% of the group), none among the elementary-school teachers (grades 1 to 9; 0% of the group), and 8 higher secondary-school teachers (6% of the group) expressed that they had not passed any first-aid course.

3.2 Providing first aid at school and outside school is not unique (excluding minor superficial injuries)

Teachers stated in the questionnaire whether they provided first aid at school and outside of school. The frequency of affirmative answers in percentage is shown in Table 2 (below).

In this questionnaire item minor superficial injuries were excluded. The comparison of health failures at schools shows that the older the children, the less often teachers reported providing first aid. The longer the teacher's practice, the greater the number of teachers reporting that they provided first aid at school. Outside schools, around one-third of all teachers stated that some health failure required first aid.

Table 2: Questionnaire – teachers providing first aid^o (affirmative answers in percentage)

		0-10 years*	11-20 years**
Teaching children 3-7 years old	at school	34	56
	outside school	30	44
Teaching children 7-15 years old	at school	21	33
	outside school	25	30
Teaching adolescents 15-19 years old	at school	18	39
	outside school	42	45

		21+ years***	In total
Teaching children 3-7 years old	at school	62	51
	outside school	27	34
Teaching children 7-15 years old	at school	70	41
	outside school	56	37
Teaching adolescents 15-19 years old	at school	39	32
	outside school	17	35

Note: ^o Minor superficial injuries are excluded.,
 * Teaching 0-10 years, **Teaching 11-20 years,
 ***Teaching 21+ years.
 Source: Authors.

3.3 Balanced incidence of trauma and acute conditions of chronic diseases

The ratio of the incidence at schools for traumas (55%) and acute conditions of chronic diseases (45%) is almost identical for traumas and non-traumatic acute conditions outside schools (52%: 48%). These ratios include a higher incidence of specific conditions such as musculoskeletal traumas and allergy symptoms in childhood (predominantly at schools) and circulatory failures in the elderly population (predominantly outside schools).

3.4 Level of knowledge of first aid among groups of teachers

The level of knowledge of first-aid procedures was assessed through standard first-aid questions in one part of the questionnaire. Each first-aid item (as shown below in Tables 5, 6, and 8) was worth 1 point for one correct answer. Means and standard deviations (SD) are presented in Table 3 (below).

In the knowledge part of the questionnaire, the highest mean values were calculated for elementary-school teachers, the lowest mean values for pre-primary school teachers. As shown below, the ratio of correct answers varies considerably, and the success of subgroups also depends on the specific question of the questionnaire (probably influenced by the content of the first-aid courses).

Table 3: Questionnaire – level of knowledge of first aid (correct answers in percentage)

	0-10 years*	11-20 years**	21+ years***	In total
Teaching children 3-7 years old	71.1 (21.1)	69.7 (26.1)	65.4 (25.8)	68.7 (23.8)
Teaching children 7-15 years old	75.9 (26.3)	85.5 (13.9)	90.9 (6.8)	84.1 (18.2)
Teaching adolescents	69.5	78.9	73.7	74.0

15-19 years old	(16.2)	(12.1)	(12.7)	(13.9)
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Note: * Teaching 0-10 years: Mean (SD),
 **Teaching 11-20 years: Mean (SD),
 ***Teaching 21+ years: Mean (SD).
 Source: Authors.

The differences in the mean values of knowledge of first aid in total between all subgroups of teachers were significant. The difference in the mean values of pre-primary teachers and elementary-school teachers (p=0.000), the difference in the mean values of elementary-school teachers and higher secondary-school teachers (p=0.000), and the difference in the mean values of pre-primary teachers and higher secondary school teachers (p=0.039) were calculated.

3.5 Level of knowledge of first aid divided into trauma and non-traumatic acute conditions

As traumas the following were included: control of consciousness and breathing, cardiopulmonary resuscitation, choking, massive bleeding, falls from a height, concussion, and epistaxis. As non-traumatic acute conditions the following were included: asthma attack, convulsive state/epilepsy, hypoglycaemia/diabetes mellitus, and anaphylaxis.

Mean values, standard deviations (SD), and p-values of Student's t-test are presented in Table 4 (below).

The differences in the mean values trauma and non-traumatic acute conditions within all pre-primary school teachers, all elementary-school teachers, and all higher secondary-school teachers were significant. Higher mean values were calculated in almost all subgroups in questions focused on non-traumatic acute conditions than in questions focused on traumas. As shown below, the rate of correct answers with regard to specific health conditions varies considerably (probably influenced by the content of the first-aid courses).

Table 4: Questionnaire – level of knowledge of first aid (correct answers in percentage)

		0-10 years*	11-20 years**
Teaching children 3-7 years old	trauma	67.1 (25.2)	65.6 (29.6)
	non-trauma ^o	78.0 (10.8)	77.0 (20.2)
Teaching children 7-15 years old	trauma	68.1 (30.1)	86.1 (7.1)
	non-trauma ^o	89.5 (10.5)	84.5 (23.2)
Teaching adolescents 15-19 years old	trauma	67.7 (18.0)	77.6 (12.0)
	non-trauma ^o	72.5 (14.2)	81.3 (13.8)

		21+ years***	In total
Teaching children 3-7 years old	trauma	65.0 (30.1)	65.9 (26.9)
	non-trauma ^o	66.0 (20.1)	73.7 (16.9)
Teaching children 7-15 years old	trauma	90.9 (7.0)	81.7 (20.0)
	non-trauma ^o	91.0 (7.4)	88.3 (14.1)
Teaching adolescents 15-19 years old	trauma	71.9 (10.8)	72.4 (13.9)
	non-trauma ^o	77.0 (16.9)	76.9 (14.1)

		t-test (p)
Teaching children 3-7 years old	trauma	0.004
	non-trauma ^o	p<0.01

Teaching children 7-15 years old	trauma	0.003
	non-trauma ^o	p<0.01
Teaching adolescents 15-19 years old	trauma	0.018
	non-trauma ^o	p<0.05

Note: ^oNon-traumatic acute conditions,

* Teaching 0-10 years: Mean (SD),

**Teaching 11-20 years: Mean (SD),

***Teaching 21+ years: Mean (SD).

Source: Authors.

3.6 Level of knowledge of first aid – resuscitation

Mean values of correct answers in percentage are presented in Table 5.

Table 5: Questionnaire – knowledge of first aid – resuscitation (correct answers in percentage)

		0-10 years*	11-20 years**
Teaching children 3-7 years old	control of consciousness and breathing	41	20
	cardiopulmonary resuscitation	41	40
Teaching children 7-15 years old	control of consciousness and breathing	100	93
	cardiopulmonary resuscitation	55	93
Teaching adolescents 15-19 years old	control of consciousness and breathing	87	87
	cardiopulmonary resuscitation	53	74

		21+ years***	In total
Teaching children 3-7 years old	control of consciousness and breathing	18	26
	cardiopulmonary resuscitation	32	38
Teaching children 7-15 years old	control of consciousness and breathing	94	96
	cardiopulmonary resuscitation	100	83
Teaching adolescents 15-19 years old	control of consciousness and breathing	63	79
	cardiopulmonary resuscitation	76	68

Note: * Teaching 0-10 years, **Teaching 11-20 years,

***Teaching 21+ years.

Source:

Authors.

The comparison of fundamental first-aid items (control of consciousness and breathing and process of cardiopulmonary resuscitation) among the groups of teachers shows the highest mean values in elementary-school teachers.

It is well known that choking is a quite frequent reason for resuscitation in young children. For this reason, it is unflattering for the administration of pre-primary schools that teachers caring for young children had the lowest mean values of correct answers, especially the subgroup with the longest practice. It is necessary to appeal especially to pre-primary school administration in order to prevent any tragedies and to ensure first-aid training for all teachers.

3.7 Level of knowledge of first aid – other traumas

Traumas are ubiquitous. Their frequency at schools is influenced by the prevention rules, but partly they are the result of coincidence.

Mean values of correct answers in percentage are presented in Table 6.

Table 6: Questionnaire – knowledge of first aid – other traumas (correct answers in percentage)

<i>Choking</i>		0-10 years*	11-20 years**
Teaching children 3-7 years old		97	96
Teaching children 7-15 years old		84	88
Teaching adolescents 15-19 years old		87	97

<i>Choking</i>		21+ years***	In total
Teaching children 3-7 years old		93	95
Teaching children 7-15 years old		86	86

<i>Massive bleeding</i>		0-10 years*	11-20 years**
Teaching children 3-7 years old		64	56
Teaching children 7-15 years old		95	90
Teaching adolescents 15-19 years old		74	81

<i>Massive bleeding</i>		21+ years***	In total
Teaching children 3-7 years old		70	63
Teaching children 7-15 years old		94	93
Teaching adolescents 15-19 years old		76	77

<i>Falls from a height</i>		0-10 years*	11-20 years**
Teaching children 3-7 years old		97	100
Teaching children 7-15 years old		75	83
Teaching adolescents 15-19 years old		70	75

<i>Falls from a height</i>		21+ years***	In total
Teaching children 3-7 years old		100	99
Teaching children 7-15 years old		96	85
Teaching adolescents 15-19 years old		68	71

<i>Concussion</i>		0-10 years*	11-20 years**
Teaching children 3-7 years old		83	83
Teaching children 7-15 years old		55	73
Teaching adolescents 15-19 years old		66	68

<i>Concussion</i>		21+ years***	In total
Teaching children 3-7 years old		75	80
Teaching children 7-15 years old		86	71
Teaching adolescents 15-19 years old		83	72

<i>Nosebleed/epistaxis</i>	0-10 years*	11-20 years**
Teaching children 3-7 years old	47	64
Teaching children 7-15 years old	13	83
Teaching adolescents 15-19 years old	37	61

<i>Nosebleed/epistaxis</i>	21+ years***	In total
Teaching children 3-7 years old	67	59
Teaching children 7-15 years old	80	59
Teaching adolescents 15-19 years old	54	51

Note: * Teaching 0-10 years, **Teaching 11-20 years,

***Teaching 21+ years.

Source: Authors.

Sufficient results can be seen for choking and falls from a height among all teachers, and massive bleeding among elementary-school teachers. With the exception of almost all cases of epistaxis, the table shows traumas that are associated with a significant risk of loss of life. The overall results are unacceptable, especially when we consider that providing help when confronted by these traumas is the usual content of any basic first-aid course.

3.8 Teachers interact with children and adolescents with chronic diseases at school

While traumas can happen in every class, teachers usually have the opportunity to share information about chronic diseases in children and adolescents attending school. Food allergies or intolerance to food (dairy products, chocolate, gluten and citrus) were the most frequent chronic diseases mentioned in questionnaires. In recent decades the trend of a higher incidence of allergies and food intolerance has been stated across the whole Czech Republic (Fuchs, 2011; UZIS, 2021). Also pollen allergy, chronic rhinitis (with epistaxes), epilepsy, bronchial asthma, diabetes mellitus, and allergy to insect bites were expressed.

Teachers stated in the questionnaire whether they interacted with pupils with chronic diseases at school. The frequency of affirmative answers in percentage is shown in Table 7.

Table 7: Questionnaire – teachers interact pupils with chronic diseases (affirmative answers in percentage)

	0-10 years*	11-20 years**
Teaching children 3-7 years old	76	88
Teaching children 7-15 years old	48	55
Teaching adolescents 15-19 years old	53	68
	21+ years***	In total
Teaching children 3-7 years old	93	86
Teaching children 7-15 years old	72	58
Teaching adolescents 15-19 years old	83	68

Note: * Teaching 0-10 years, **Teaching 11-20 years,

***Teaching 21+ years.

Source: Authors.

Teachers of three- to seven-year-old children stated more interactions with pupils suffering from chronic disease than other teachers. This result corresponds to the closer relations between pre-primary school teachers and children.

3.9 Level of knowledge of first aid – acute conditions of chronic diseases

Mean values of correct answers in percentage are presented in Table 8.

Table 8: Questionnaire – knowledge of first aid – acute condition/chronic diseases (correct answers in percentage)

<i>Asthma attack</i>	0-10 years*	11-20 years**
Teaching children 3-7 years old	73	72
Teaching children 7-15 years old	87	93
Teaching adolescents 15-19 years old	74	90
	21+ years***	In total
Teaching children 3-7 years old	63	69
Teaching children 7-15 years old	94	91
Teaching adolescents 15-19 years old	98	87
	0-10 years* <td>11-20 years**</td>	11-20 years**
<i>Convulsive state/epilepsy</i>		
Teaching children 3-7 years old	78	84
Teaching children 7-15 years old	100	95
Teaching adolescents 15-19 years old	63	84
	21+ years***	In total
Teaching children 3-7 years old	73	78
Teaching children 7-15 years old	96	97
Teaching adolescents 15-19 years old	66	71
	0-10 years* <td>11-20 years**</td>	11-20 years**
<i>Hypoglycemia/diabetes mellitus</i>		
Teaching children 3-7 years old	68	52
Teaching children 7-15 years old	76	50
Teaching adolescents 15-19 years old	61	61
	21+ years***	In total
Teaching children 3-7 years old	40	53
Teaching children 7-15 years old	80	69
Teaching adolescents 15-19 years old	61	61
	0-10 years* <td>11-20 years**</td>	11-20 years**
<i>Anaphylaxis/allergies</i>		
Teaching children 3-7 years old	93	100
Teaching children 7-15 years old	95	100
Teaching adolescents 15-19 years old	92	90
	21+ years***	In total
Teaching children 3-7 years old	88	94

Teaching children 7-15 years old	94	96
Teaching adolescents 15-19 years old	83	88

Note: * Teaching 0-10 years, **Teaching 11-20 years, ***Teaching 21+ years.

Source: Authors.

Laudable results can be seen in first aid (a) for anaphylaxis (extreme allergy symptom) among all teachers, (b) for asthma attack among teachers of children and adolescents 7-19 years old and (c) for convulsive state (in many cases this is a symptom of epilepsy) among elementary-school teachers.

The table shows non-traumatic acute conditions that are associated with a significant risk of loss of life. As reported in results for other traumas, the overall results are unacceptable, especially when we consider that helping with these acute conditions of chronic diseases is the usual content of any basic first-aid course.

3.10 Changes in the health status of children and adolescents managed by a teacher

Teachers mentioned subsequent changes in the health status of the child (listed from the most frequent to rare in the questionnaires): nausea, headaches, elevated temperatures or fevers, abrasions and lacerations, fractures caused by the child falling, complications of allergies (pollen, mites, food, insect bites) and food intolerance, removing a tick, asthma, convulsive state/epilepsy, hypoglycaemia/diabetes mellitus, concussion, nosebleeds, faint, the child getting the wind knocked out of him/her, suffocation, a knocked-out tooth, scalding, anaphylaxis, burns and scalds, panic attack, a foreign body being embedded in the wound, or swallowing an object. First aid in all these conditions can and ought to be explained through a first-aid course for teachers.

3.11 Frequency and methods in first-aid courses for teachers

The questionnaire also included the question of what frequency and methods of education in this field teachers preferred. Answers like "I do not want to take another first-aid course" or "A first-aid course is suitable only for physical-education teachers" etc. (27 teachers; 7% in our file) were set aside. The remaining teachers expressed their wish to take a first-aid course once every year or every two years (71%), predominantly using simulations (93%).

3.12 Teachers claimed ability to provide appropriate first aid

The frequency of affirmative answers in percentage is shown in Table 9 (below).

Except for teachers of children aged 7-15 years, the teachers expressed a considerable degree of uncertainty in their ability to provide appropriate first aid.

Table 9: Questionnaire – teachers claimed ability to provide appropriate first aid (affirmative answers in percentage)

	0-10 years*	11-20 years**
Teaching children 3-7 years old	72	69
Teaching children 7-15 years old	89	100
Teaching adolescents 15-19 years old	55	61
	21+ years***	In total
Teaching children 3-7 years old	64	68
Teaching children 7-15 years old	96	95
Teaching adolescents 15-19 years old	44	53

Note: * Teaching 0-10 years, **Teaching 11-20 years, ***Teaching 21+ years.

Source: Authors.

4 Discussion

Some teachers (3% of all teachers) stated None with regard to a first-aid course. According to Czech law and from the point of view of pupils and their parents, it seems impossible for children and adolescents to be under the charge of someone who has not passed any first-aid course. Also Palasová (2015) mentioned that 5% of preschool educators had not completed any first-aid course, Tajovská (2010) stated the shocking figure of 32% of pre-school teachers who had not completed any first-aid course, and only 21% of the Greek higher secondary school teachers had ever participated in life-support courses (Patsaki et al., 2012). Anyway, a lack of knowledge of first aid can have serious consequences for a particular teacher.

Our teachers report at school a higher frequency of acute conditions compared to Pachulová (2012; 26% of elementary and higher secondary-school teachers) or a lower frequency compared to Filip (2018; 51% of elementary teachers, the file contains more physical-education teachers than would correspond to a random sample). Not only physical-education teachers but any teacher should know first aid. It is necessary to understand that the health status of any student can change during any lesson. Should it be necessary to add other reasons why knowledge of first aid is necessary, all relevant medical statistics on Czech children and adolescents are provided by UZIS (2022).

The level of knowledge of basic first aid was insufficient (mean values between 69% in pre-primary and 84% in elementary-school teachers in standard first-aid test). Unflattering results in first-aid tests were also stated for secondary-school teachers in Poland (Bakalarski, 2020; Sosada, Zurawiński, Stepień, Makarska, & Myrcik, 2002), Turkish primary-school teachers (Başer, Coban, Taşci, Sungur, & Bayat, 2007), etc. The result among elementary-school teachers for massive bleeding (93%) in our file is in accordance with the adequate test item in the reference file (Hladíková, 2008; 96%), but the mean values for epistaxis differ (59% in our file vs 75% in reference file). The mean value for convulsive state/epilepsy among elementary-school teachers in our file (97%) was considerably higher than the value in the file of Hladíková (2008; 46%).

As teachers mentioned changes in the health status of the child, our findings mostly correspond to the data of the Emergency Medical Service (Hrušková et al., in press) and the results of Tajovská (2010). The statistics of the Emergency Medical Service (Hrušková et al., in press) also mentioned drowning, intoxication, or unspecified psychotic/behavioral disorders. First aid in all these conditions can and ought to be explained during a first-aid course for teachers.

Except for teachers of children aged 7-15 years, the teachers expressed a considerable degree of uncertainty in their ability to provide appropriate first aid. Similarly e.g. 50% of Flemish teachers felt that they lacked knowledge of first aid (Mpotos, Vekeman, Monsieurs, Derese, & Valcke, 2013). It can be recommended that a higher frequency and targeting of first-aid courses should be provided to everyone (e.g. passing a first-aid course containing possible health conditions using simulations once every two years).

5 Conclusion

Teachers filled out a questionnaire that contained first-aid test questions as well as questions about pupils' health complications and the teacher's preference for first-aid courses and other opinions. The level of knowledge of first aid is higher among elementary-school teachers (grades 1 to 9), but the overall results are unacceptable, especially when we consider that we tested the usual content of any basic first-aid course for teachers (mean

values between 69% in pre-primary and 84% in elementary-school teachers in a standard first-aid test). Training in first aid be provided using both traumatic and non-traumatic acute conditions once per one year or once every two years using simulations was preferred by our teachers.

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IDENTIFYING THE SIGNIFICANCE OF THE IMPACT OF THE CANVAS BUSINESS MODEL ON STARTUPS' PERFORMANCE INDICATORS

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This paper is an output of the project VEGA 1/0328/21 Post-pandemic business management: identifying temporary and sustainable changes in sequential and parallel management functions in the context of the COVID-19 pandemic

Abstract: Startups are unpredictable, but above all unpredictable enterprises, which can hardly be attributed a universally valid recommendation for their existence. For startups, it is very important to recall that there is no constant business model for them. The current literature provides a number of business models that could be a guide for startups, but it would make little sense to establish a universally valid model given their diversity, instability and variability. In this paper, we describe the Canvas business model, which serves as a visualization of the current state of real functioning Slovak startups, and we further gain valuable insights and valuable knowledge based on this model. The main objective is to identify the significance of the impact of the Canvas business model on the performance indicators of startups. The achieved results and the metamorphosis of real functioning startups contribute to the expansion of knowledge of this relatively new and promising entrepreneurial phenomenon. The startup environment is many times presented by the most successful representatives and the less successful ones quietly sink into oblivion. Representatives of unsuccessful startups do not like to provide data and information about their business.

Keywords: startup, Canvas business model, performance.

1 Knowledge base about startups

Human individuality provides myriad perspectives on the world. Each personality sees it differently. A physicist sees it as a set of laws that make things happen around us. A doctor sees it as a mixture of human bodies, each one identical and original. A mathematician sees it as a set of ubiquitous numbers. But what is the world really like? Dynamic, strange, unique and authentic. No plot will take place again in the same conditions.

The current economy can also be seen as a structure of enterprises that are the driving force of the entire global economy. From multinational corporations, to large enterprises, to medium and small enterprises. Small and medium-sized enterprises require the most attention, in terms of financial support or tax burdens. This type of business makes up the largest proportion of businesses across Europe, yet they do not receive adequate attention. After all, even today's media, motivated by fascination and viewership, will only marginally mention the achievements of small and medium-sized entrepreneurs. It is therefore more than necessary to address this subject and to strive to improve it.

Small and medium-sized enterprises also make up the largest part of the entrepreneurial state in Slovakia. The biggest problem tends to be access to capital at the initial stage of entrepreneurship, which can be fatal for start-ups. In order for the national economy to function more effectively, attention must also be drawn to smaller business entities, start-ups, which, however, rarely survive without help. We must provide them with support and accept their efforts to survive on the market.

1.1 Startup as a specific form of entrepreneurship

The last decade can be characterised as an explosion of startups. They started to spread from the American Silicon Valley and started to change the global economy and the competitiveness of businesses. These are the businesses that have changed the world. The literature on this new, unexplored topic is gradually growing. A number of authors are trying to establish a theoretical basis for this type of entrepreneurship, or to provide

advice to people who are trying to change the world for themselves and others through startups.

One of the best-known authors dealing with the topic of startups is undoubtedly Eric Ries, an American entrepreneur and author of many articles on startups. Eric Ries has been at the origin of several startups, including IMVU. He has provided advice on business and product strategy to venture capital firms. Eric Ries (2011) characterizes the startup as an attractive form of entrepreneurship that gives room for expectations to grow, but they can also be disappointing. He considers a startup as an institution made up of people whose main goal is to create a new product or service under truly extreme and unstable conditions. According to him, a startup is absolutely a human enterprise, it is not an enterprise based only on a product, a technology or an innovative idea.

Steve Blank (2015) is also an expert on startups and has revolutionized the practice and teaching of entrepreneurship and innovation. Customer preference was a key factor in his search for a successful business model, which is where he came up with the topic of startups. Steve Blank worked with Bob Dorf on a book called *Every Startup Founder's Handbook* (2012) in which they clearly and distinctly categorize a startup as a temporary organization seeking a scalable, repeatable, and profitable business model. He found that startups are not small versions of large companies, because large companies operate according to business models, startups are still searching for them. Startups on their entrepreneurial journey have adopted the methodology of product development, product launch, familiarized themselves with life cycle phases, identical processes taught in business schools. Blank and Dorf examined in detail the all-too-&conspicuously identical reasons for startup failures. From this, they came to the insight that startups need their own entrepreneurial tools, different from the tools used to manage large, existing businesses, because every startup is navigating unknown and uncharted waters. A startup's vision consists of a series of untested hypotheses that require a customer response. Information or data should be regularly refreshed in days or weeks, not months or years. The important thing is to keep it up to date and not waste time on unnecessary product improvements that customers don't actually want.

Slávik and Hagarová (2016) expanded the literature with their findings: 'a startup operates in an environment of uncertainty to indeterminacy, but at the same time strives to find concrete and usable solutions, grows dynamically and tentatively without boundaries, employs people who give up the security of a regular job at the cost of exciting personal growth and achieving concrete results, may or may not work on the basis of technology, and ceases to be a startup after crossing certain boundaries'.

The perspective of American entrepreneur Paul Graham, who co-founded Y Combinator, is also interesting. In 1995 he and Robert Morris founded Viaweb, the first SaaS company, which became Yahoo in 1998. Y Combinator is a company that provides seed venture capital to startups. The main goal is to help a startup get through the first, most difficult phase of its existence and then introduce the startup to larger investors or companies interested in acquiring it (Paul Graham, 2014).

From his own experience, Paul Graham (2012) characterizes a startup as a business designed for rapid growth. "Merely founding a business is not in itself founding a startup. Nor is it necessary for a startup to start working on a technology or to use venture capital funding or to have an elaborate exit plan from the startup scene. The only important thing for a startup is growth. Everything else we associate with startups stems from growth." In 2018, the Slovak legislature adopted the Act No. 290/2016 Coll. on the Support of Small and Medium-Sized Enterprises on the Provision of Subsidies under the Competence of the Ministry

of Economy of the Slovak Republic, as amended, which regulates the forms and method of providing support and the competences of the Ministry of Economy of the Slovak Republic in the field of small and medium-sized enterprises. This Act defines a startup as "a commercial company with mandatory capital formation, with its registered office in the Slovak Republic, which has not been established for more than 36 months and which is controlled by a natural person who is its founder and is an innovative enterprise, micro-enterprise, small enterprise or medium-sized enterprise (Zbierka Zákonov Slovenskej, 2016).

The international Startup Ranking company focuses on providing up-to-date information from the startup environment. The mission of this company is to discover, rank and promote startups from all corners of the world. The main goal is to contribute to the digital discovery and development of startups with services that help them gain global visibility, improve organic search engine rankings, and transform strategic decisions (Startup Ranking, 2021a). According to Startup Ranking, the largest number of startups are currently based in the United States, up to 99,162 startups. This is followed by India with a total of 10,275 startups, and the United Kingdom with 5,699 startups. Slovakia ranks 75th in this ranking with 70 startups (Startup Ranking, 2021b). American startups that are among the top of the current startups not only in America but also in the world include Giphy, Buffer, PicsArt, Coursera, IFTTT, Skillshare and DoorDash. (Startup Ranking, 2021c). The top 70 Slovak startups include sli.do, Exponea, KWFinder, Kickresume, Kontentino, Paylab, GymBeam, Sken.io, Infinario or Greenway (Startup Ranking, 2021d).

In 2020, there were 472 million entrepreneurs in the world, 305 million startups, 100 million startups founded, 1.35 million technology startups, 185 accelerators helped a total of 3,173 companies to exist, and 182 startups ended their lifecycle by selling to a large company (Get2Growth, 2020).

1.2 Metamorphosis of startups

In several foreign sources and dictionaries, this term is most often associated with biology or botany. Cambridge University provides a database that can be used to translate words or to explicitly explain individual words. The Cambridge Dictionary defines metamorphosis in biology as 'the process by which the young form of insects and some animals develops into the adult form', it also defines the word metamorphosis as 'a complete transformation' (Cambridge Dictionary, 2021). One of the oldest databases, Merriam-Webster, provides a view of metamorphosis as "a change in physical form, structure, or substance, especially by supernatural means" or as "a conspicuous change in appearance, character, or circumstance" (Merriam-Webster, 2021). Like Cambridge University, Oxford University also provides a glossary for those interested, defining metamorphosis as "the process by which someone/something changes completely into something else" (Oxford Learner's Dictionaries, 2021).

Based on several scholarly explanations, metamorphosis can be defined as a process of transformation that acts on someone or something and causes completely different structures or characteristics. In this paper, we focus on startup metamorphosis, which is the transformation of an entrepreneurial idea into a functioning startup with relatively favourable performance indicators.

1.3 The success of startups

One less positive fact of this entrepreneurial phenomenon is mentioned in the literature and in the general public in connection with startups - failure. Founders of less successful startups do not feel the need to share their experiences and knowledge with other founders, which would help the public and academia to expand knowledge and thus provide guidance for startup enthusiasts and future founders.

Idealab's founder, Bill Gross, asked the same question - what activity or factor greatly influences the success of a startup, what is behind successful startups? Gross researched over 200 startups and found that in 42% of the cases, the right timing was behind the success (Schroeder, 2019). Idealab, a company primarily focused on startups, decided to conduct quantitative research in which they analysed startups collaborating with Idealab and non-cooperating startups. The company's team focused on one hundred startups that Idealab helped to exist and one hundred startups that did not benefit from Idealab's help. The research found that startup funding was key in the success of startups for only 14% of the startups studied, the business model was significant for only 24% of the startups studied, the business idea was involved in the success of the startup in only 28% of the startups studied, and the composition of the team played a role in the overall success of the startup in 32% of the startups studied. From the research how to win came out the right timing of the product, so the author Schroeder (2019) refers to those interested in founding a startup to ask themselves if they consider the right time for launching their product to the market.

Kevin Laws (2015) considers the mission of a startup to be crucial in the success of a startup because founders who strive to create value not only for themselves, customers, and investors are the ones who are trying to change the world in some way. If a founder decides to start a startup with the vision of skyrocketing earnings, in that case, he or she has many more reasons to discontinue the business in the first few years or even shut down the business altogether due to high costs and low revenue, and such startups are not destined for massive success.

A similar view is held by Nortenko (2020), who recommends that future startup founders should strive to be innovators as much as possible and provide consumers with a product that will make their lives easier. Another recommendation relates to competition, because nowadays there are competing businesses in almost every industry, so startup enthusiasts and future founders should have an overview of businesses that could take over customer segments in the future. It often happens that founders see a product solely from their point of view and therefore cannot objectively judge its sophistication or "user friendly" approach. The author further recommends to follow the rule "less is sometimes more" and not to overcomplicate the business idea, to launch the basic idea and to work together with consumers to improve it.

The views of renowned authors in the field of research identify several perspectives on the startup and its main attributes. In our case, the object of study is startups, which meet the following definition: "a startup is a small enterprise, occurring in unstable to extreme conditions, that seeks to reach consumers by providing a product that is not yet provided by any other competing enterprise or was the founder of an innovative idea in the industry."

Startups are subject to the research, where it is essential that they meet additional criteria. The first factor considered is originality - the business must be based on a new original technology, a significantly improved use of an existing technology or the creation of a completely new need. Another important factor is the size of the business - we will work with startups that are very small businesses with a maximum of 10 employees. The third requirement is the assumption of rapid to exponential growth. The age of the enterprise is also a necessary factor, which limits the startups worthy of the research sample to no older than 5 years. Last but not least, the key issue for us is funding and sources of funds, which the founder can raise as savings from family or friends, through an angel investor, or in the form of venture capital.

1.4 Startup as a special category of small and medium-sized business

Small and medium-sized businesses are the engine of any national economy. The Slovak Republic recognises the

importance of SMEs and therefore provides various forms of support within its ministries.

The Slovak Enterprise Agency publishes an annual Report on the State of Small and Medium-Sized Enterprises in the Slovak Republic to inform and provide an overview of this type of enterprise within our country. In 2018, small and medium-sized enterprises accounted for 99.9% of all business entities in the Slovak economy. More than 73% of all SME businesses contributed to employment in the corporate economy and more than 54% of businesses contributed to value added. Compared to 2017, value added grew by 11% overall and employment in the sector grew by 1.4% (Slovak Business Agency, State of Small and Medium Business Report, 2019).

Small and medium-sized businesses are the largest initiators of entrepreneurial opportunities. In particular, their activities make them more closely connected to the region and the citizens themselves. Interested entrepreneurs can receive financial or educational support implemented by several entities. Applicants can obtain financial support through loans, micro-loans, venture capital, in the form of non-repayable financial assistance, they can also benefit from funding for selected activities from national or supranational funds (National Holding Fund, 2014).

The issue of small and medium-sized enterprises has also been raised in the work of Strážovská et al. (2013). According to the authors, small and medium-sized enterprises are the most important element of national economies, play an irreplaceable role in the dynamic development of countries with advanced market economies, enrich the business world with innovative elements and, last but not least, are highly adaptable to market requirements. Small and medium-sized enterprises are undoubtedly threatened by a number of competitive disadvantages which, in turn, stem precisely from the characteristics of this type of business. The weaknesses of SMEs include financial barriers at the beginning of the business, unstable market situation, small number of employees, insufficient marketing, lower potential for attracting foreign capital and less opportunity to use professional staff (Strážovská et al., 2013).

At first glance, we can say that a startup perfectly meets the characteristics of a small and medium-sized business. It can benefit from all forms of financial or educational support. It is also covered by the validity of the Law on Support of Small and Medium Enterprises. However, what is the gap between a start-up and a small business? We present a few examples, which are summarized according to the author Marzett (2018):

Innovation - forms the biggest gap between an SME and a startup. The SME makes no claims on the technology used - restaurant, law firm, hairdresser, barber. In many cases a startup is based solely on new technology. The point of a startup is to create something new and improve on what already exists.

Profit - the outcome of the business, which SMEs expect from the first day of existence, whereas in a startup generating the first cents can take months. The biggest goal in a startup is to create a product that customers will like. A startup's product tends to be so specific and differentiated that if it finds its way to customers, profits can subsequently be generated in the millions.

Financing - private investment, funds from family, friends or bank loans are usually used to start a small business. For this type of business, it is not advisable to incur debt as this may affect profits in future periods. Startups can also be privately funded, but the development of a specific product requires a larger amount of start-up funds. An entrepreneurial angel or venture capital investor can contribute to the development of a startup. Crowdfunding is also on the rise.

Another important distinction is the legal form of the company. Small and medium-sized enterprises mostly use the legal form of a limited liability company (s.r.o.). Any newly emerging startup can use the new legal form existing since 2017, which was

primarily created for this type of business. The simple limited liability company (j.s.a.) is regulated by Act No. 513/1991 Coll. of the Commercial Code. The Commercial Code defines a simple joint stock company as "a company whose share capital is divided into a certain number of shares with a certain nominal value. The company shall be liable for the breach of its obligations with all its assets. The shareholder is not liable for the company's obligations" (Commercial Code, 2019). The biggest difference between these options, is in the amount of the share capital - in the case of j.s.a. the minimum amount of the share capital is 1 euro, while the minimum amount of the share capital in s.r.o. is 5 thousand euros. It is important to mention that the j.s.a. must have at least one shareholder, but the maximum number is not determined, while in the s.r.o. the maximum number of shareholders is 50 (Seneši, 2017).

The choice of the right legal form is important not only for the founder but also for the shareholders, because in the long run it determines the profit shares and the subsequent motivation. The appropriate legal form can help in unpleasant life situations, which may include disagreements between shareholders, inability to repay the amount of the deposit, etc. When setting up a company, it is also essential to take into account the amount of the contribution, which determines the amount of rights and obligations.

The startup environment is characterized by dynamism for both startups and customers. We can say that each investment company has its own classification of startups. However, we will rely on an American author who is considered one of the founders of modern entrepreneurship. Steve Blank (2013) has provided a narrative view of startups, introduced the issues of this business and, last but not least, laid the foundations of theoretical knowledge. He classified startups into the following groups:

- Startup as a small business includes all start-ups whose main source of funding is their own savings. These businesses are characterised by good organisation but slow profit growth. Many businesses in this group are family businesses, groceries or hairdressers. A great option in this group of businesses is a franchise agreement, which will give less experienced entrepreneurs an easier and faster entry into the market.
- Startup as a lifestyle allows the founder to combine personal life with professional life, due to the fact that it is not limited by being tied to a specific work environment. In the context of this group of startups, we can mention co-working centres, which offer a shared working environment with internet access. This group of startups includes various programmers, IT specialists or consultants. It doesn't matter where they work from, what is important for them is the internet connection.
- A scalable startup is based on external funding of the company, the source of capital is usually venture capitalists or business angels. Scalability is characteristic of technology startups that are heading for global markets. Excellent examples of this group of startups are representatives from Silicon Valley. Such startups hire the best people in the industry. They are looking for a repeatable and scalable business model. Their main feature is joining together in innovation clusters. Author Steve Blank (2010) describes the vision of these companies in creating not only a product but also a new industry.
- A social startup seeks to improve the social level, it is not primarily focused on capturing market share. These companies often take the legal form of a non-profit organization. The founders are as tenacious as the founders of a scalable startup, but are driven by a different purpose (Blank, 2018).
- A for-sale startup is characterized by similar features as a scalable startup, but with different goals. The founders of

this startup are looking for a suitable opportunity to end the active period of the startup on the scene. Through acquisition, large companies are looking to expand their innovation portfolio. The object of this deal is the innovative idea of the startup that can provide the international company with a growing customer segment and generate more revenue (Blank, 2014).

- According to Roštárová (2015), a startup inside an established company is a new element in Slovakia. The author states "companies are starting to replace their traditional R&D departments with startup projects that are developed inside the company or in an incubator, and the company pays the cost of their membership and lets experts from the incubator to develop the startups instead of in-house company specialists".

1.5 Causes of startup failure

The meaning of the word success has several definitions. When is a startup successful when it survives the most critical period of its life cycle or when it becomes the most valuable startup in the global economy?

On startup success, founders are eager to pass on their advice, tips and experiences. How about the other way around, if a startup isn't making such dizzying profits? This flipside was addressed by CB Insights, an American portal that collects and analyses huge amounts of data using algorithms and data visualisation. The portal's main role is to provide answers to important strategic questions and to supply businesses with data that will make decision-making easier, not just strategic.

Based on the information gathered, the CB Insights portal (2019) has compiled a ranking of the most common failure factors. The survey was conducted on 101 startups that, unfortunately, failed to withstand the pitfalls of the startup environment.

The most common cause of failure tends to be not needing the product in up to 42% of cases. The founder of the startup is adamant about the originality and innovativeness of the product, and if it comes to production without prior analysis of customer segments, there may be a situation where the product does not find the right feedback from consumers. A startup will not be helped by great technology, excellent data on customer buying behaviour, expertise of team members if it does not address the current market need.

Another major reason for failure is lack of capital. Money and time are limited not only in a startup and it is important to allocate them judiciously. Improper allocation of capital was cited by as many as 29% of startups as the source of their failure. The third most serious reason for startup failure is assembling the wrong team. A diverse team with different experience was often cited as critical to overall success. Founders only become aware of a missing or inappropriately assembled team in hindsight. When starting a business, founders are brimming with confidence and don't feel the need to share initial enthusiasm with other team members, but over time, as more and more activities occur, there is a misallocation of tasks and roles. The team issue was key for up to 23% of startups.

Despite opinions that startups don't need to give their attention to competitors, this is not entirely true. Once a startup starts selling a product or service, it should be on the lookout. Competition was the cause of failure for up to 19% of startups. Obsessing about competition is not the right move because not enough attention is paid to business development.

Lack of marketing can also be an interesting factor. Knowing your customer segment, being able to reach them and delivering the product the right way is one of the most important skills of a successful startup. Knowing how to grab attention and convert even non-customers into customers. The cause of failure occurred when the startup was not able to market its product. The founders did not use the idea of proper product promotion.

Many times burnout is also a serious problem. Work-life balance cannot be overlooked indefinitely. This reason was cited by 8% of startups as a cause of failure. Knowing how to react correctly in an impasse, to reorient your mind from losses to gains is considered equally important for success or in preventing burnout syndrome. It is in this situation that we can draw attention to the necessity of a team, given the possible division of responsibilities, which would largely prevent burnout syndrome.

An unusual insight into the factors of failure can be provided by the first online publication on startups in Europe. The authors have been providing an overview of all startups since October 2010. The authors of the articles are particularly interested in technology startups, providing readers with analyses, interviews with the founders of individual startups or news from the startup environment. Startups are categorized on the site according to their respective countries. They also provide important information and news for potential startup founders. Author Arnaud (2018) created a ranking of the top ten reasons for startup failure, many of the reasons are the same as those provided to the public by CB Insights, but a few are different and have their own importance. The author advises companies on commodities trading and has founded several companies during his entrepreneurial life.

According to Arnaud (2018), the most common reasons startups fail is lack of experience. This factor does not only apply to founders, but also to team members. Many founders try to launch a startup in an industry "they don't feel at home in." It's important to start a venture in which you can leverage the experience you've already gained. Equally important is to assemble a team of members who have excellent experience, but each from a different background. Together they will form a functioning team. For the founder, it is essential to identify this experience early on and, on that basis, to expand the team with additional, experienced members.

Another cause of failure can be attributed to founders who are preoccupied with their product and are reluctant to accept feedback and criticism of the product. It is essential to realise who the product is actually for, whether it is the founder or the consumers. Without accepting customer feedback, a startup can hardly think of success in the industry. A founder may not be willing to release a prototype for a number of reasons, e.g. not being prepared enough or fearing competition. But without an initial product launch, the founder will never know the reaction and feedback from customers.

The last most common factor in startup failure can be improper timing. Some startups launch products when the right technology is not yet available. Coming up with a product that the market or consumers are not ready for can be fatal for a startup. Capturing the right moment to launch a product is essential.

1.6 Startup business model

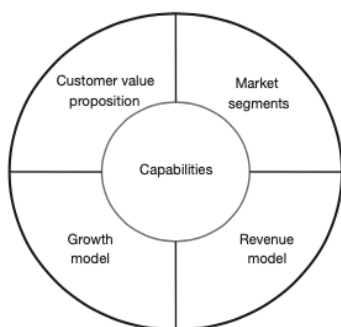
The birth of a business idea is often unexpected and spontaneous. Such an impulse can stem from a bad experience while shopping, a lack of goods on the market, if a good or service is not available at all, or simply someone wanting to make the world a better place and help other people.

Initial thinking about a project may initiate the founder to develop the idea or create innovative steps. If the business idea seems viable, it is essential to put the idea on paper; in the event of a crisis, it can remind the founder of the purpose of his or her business. The business plan serves to elaborate the business idea in more detail, thus allowing the founder to see his project from a different perspective.

The current literature provides several business models that primarily analyse the business idea, but can then be differentiated in the visualisation. We analyse two business models, namely the simplest and the most widely used.

The simplest visualization of a business model is offered by Afuah (2014), which consists of five basic components:

1. customer value - the value proposition to customers consists of the things that the company and its products/services can do for customers to solve their problems or satisfy their needs better than products from competitors. The right customer value meets customers' needs and gives them a reason to prefer the startup over competitors. However, the problem can be that customers don't always know what they expect from a given product/service. Customer value depends not only on products but also on their attributes or reputation.
2. market segments - groups of customers that are, or in the future will be, served by the startup. It is important to develop an analysis of each customer segment, how many customers are in each group, what is their willingness to pay for products. This point also includes the startup's collaborators, which may include suppliers, the aforementioned customers, competitors and other institutions
3. growth model - the growth component of the business model focuses on what the company needs to do to increase the number of its customers while keeping costs as low as possible. This step can be challenging because once a startup reaches the right customers and starts generating profits, suppliers may demand higher prices for raw materials or begin to put pressure on them to start supplying lower quality raw materials. On the contrary, customers may start demanding lower prices or higher quality products.
4. revenue model - focused on how much customers will pay, when and how. Profit generation starts with revenue. Without revenue, there would be no cost reduction. Revenue models are often referred to as business models. Revenue models include advertising, subscription or licensing. The price of the product is one of the most important components of revenue, but the pricing model tends to be a critical part of the revenue model. Pricing reflects how much a customer will pay for a product. Proper pricing has one of the most direct impacts on a startup's overall revenue.
5. capabilities - the core is made up of people, including the founder, who must acquire the funding to develop and produce prototypes. Capabilities consist of resources and activities. Resources or assets are owned by the firm while activities contribute in the production of products. Activities contribute to the transformation of resources into finished products. How many products are produced depends on the quality of the resources. A startup's resources may consist of brand, people, equipment, products, startup culture, funds, knowledge, patents, copyrights, trademarks, trade secrets, relationships with collaborators in the business world, or distribution channels.



Source: AFUAH, A. Business Model Innovation: Concepts, Analysis and Cases. 2014.

The most widely used business model comes from authors Osterwalder and Pigneur. According to them, a business model

justifies how an organization creates, delivers and captures value (Osterwalder - Pigneur, 2010). The reason for the creation of the business model by these authors is that the business model is a concept that should be understood by all. The authors present the business model as simple, suitable for startups and intuitively understandable.

The business model by Osterwalder and Pigneur (Osterwalder - Pigneur, 2010) is known as Canvas. The contents of this model are nine blocks that describe the startup's internal and external environment in great detail. The individual parts of the model include:

1. customer segment - to build an effective business model, a startup should first of all identify its customers for whom the product or service is being created. Customers can be divided into smaller groups based on their common needs and attributes,
2. customer value - the set of utilities of the products and services that the startup is going to provide to customers and differentiate it from competitors. The value a business brings to customers can be manifested through utility, design, brand, status, availability, usability or price,
3. distribution channels - a startup can deliver its product or service to target customers through multiple distribution channels. The most important thing is to focus on efficient distribution channels that are fast and above all cost effective. A startup can use its own distribution channels, partner distribution channels, or a combination of both types to target distribution,
4. customer relationships - based on the identification of the customer segment, it is necessary to set up a specific relationship for each group of customers to ensure long-term sales of the product or service for the startup,
5. sources of revenue - ways of obtaining revenue from each customer segment. The founder can determine the monetization of the product: selling the product, renting the product, or selling a basic version of the product with subsequent monthly payments,
6. key resources - an essential part of the startup that is fully involved in the creation of the product. In case of lack of resources, the founder can collaborate with external staff or use external resources. The key production factors of a startup may include financial, human, material or intangible resources,
7. key activities - a necessary step to successfully satisfy production. Without key activities, a startup cannot produce a product or provide a service,
8. key partners - partners who enter the production process and contribute to the realization of production. A startup may work with partners for various reasons, e.g. diversification of risk, use of the same production factors, use of the same production processes, use of the same distribution channels, or simply helping each other,
9. cost structure - the presentation of the cost structure for each block of the whole business model. Such a structure provides a perfect overview of the startup costs, facilitates the representation of the costs of the entire production. An invaluable aid in cost reduction or optimization.

We decided to use the Canvas business model as a basic scheme to describe startups, because it contains all the important blocks that are needed to build a business correctly.

Key partners	Key activities	Customer value	Customer relationships	Customer segment
	Key resources		Distribution channels	
Cost structure			Sources of revenue	

Source: own elaboration based on Osterwalder, A. - Pigneur, Y. Business Model Generation. 2010.

2 Aim, research sample and research methods

As mentioned above the main objective is to identify the significance of the impact of the Canvas business model on the performance indicators of startups, the results obtained and the metamorphoses of the real functioning startups to contribute to

the expansion of the knowledge of this relatively new and promising entrepreneurial phenomenon.

The fulfilment of the main objective was supported by sub-objectives:

1. to identify selected startups achieving exceptional performance indicators based on selected criteria,
2. an in-depth and detailed examination of the Canvas business model as a comprehensive visualization of the startup conducted through qualitative and quantitative research samples,
3. to elucidate the metamorphosis of startup business models,
4. to elucidate the qualitative relationships between the Canvas business model and startups' performance indicators.

The research was conducted through a questionnaire in real and functioning startups in the Slovak Republic. The questionnaire was designed for startups that met the required parameters, such as the lifetime of the business, the amount of turnover or the assumption of exponential growth. We considered a startup to be a small, fledgling business operating in unstable conditions, trying to reach consumers with an original and innovative product that no other business has offered so far.

The questionnaire designed for startups contained detailed questions that asked about the subject matter of the startup business, funding, product originality, customer segment, customer relationships, and the territorial structure of the markets served. Questions on distribution channel, competitive position and pricing policy also yielded important findings. The questions closely replicated the blocks of the Canvas business model visualisation.

Answers were closed-ended displayed in a range or multiple choice or they were open-ended responses.

Research sample 1 contained 209 startups operating in the Slovak Republic. Some startups had the legal form of a civil association or foundation and therefore did not report economic indicators.

Research sample 2 contained 176 startups whose entrepreneurial activity was captured in the Finstat (2021) database, and had the following structure:

Revenue - ranking of startups by revenue, Profit - ranking of startups by profit made, Revenue Graph - dividing startups based on achieving exponential growth, Industry Classification - we ranked the startups by industry classifications to get information on which industry is most prevalent, Debt - ranking startups by debt, Startup Awards winners - singling out startups that have won awards given to innovative projects, Date of inception - the division provides insight into the time of existence, Ratios - we have quantified the economic indicators of startups in ratios such as profit margin, which is indicative of revenue appreciation. Another ratio we examined was the turnover of total assets, which tells about the efficiency of the use of the assets of the business. The aim of this ratio is to maximize the result, former startups - businesses that can no longer be considered a startup - mainly because of the size (the number of employees exceeded 100) but just because of the sales (more than 33 million euros), startups that managed to survive the first four years of their existence - it is the first four years of the founding of the business that are important, as many startups are not able to survive during the first three to five years of their existence. Out of 176 startups, only 43 were able to survive the first four years. This figure comes from the number of entries in their history.

Research sample 3 - final startups, selected businesses that were the subject of an in-person questionnaire survey in the entrepreneurial outreach. The number of these startups is 30, to meet the minimum statistical sample. Their selection was based on several criteria, which were: assumption of exponential growth (according to the sales graph), active activity in the

market, activity during the first four years (according to the number of entries in the history).

All economic data on startups and their financial indicators were obtained from the publicly available Finstat (2021) database - name of the startup, website, name and contact of the founder, name of the company under which it appears in the Finstat (2021) database, industry classification and its numerical characteristics, date of creation, number of entries in the Finstat (2021) database, revenue generated, total revenue, profit generated, assets of the startup, equity ratio, total indebtedness, gross margin, number of employees.

At the beginning of 2020, we were all paralysed and unpleasantly affected by the global situation associated with the Covid-19 pandemic, which did not bypass the academic environment. This has also affected the development of research, and we have had to make operational efforts to maintain our predetermined course of action. The impact of the pandemic made it impossible for us to draw a continuous sample. Due to the pandemic that emerged and is still ongoing, we were forced to create an additional statistical sample, from which we then selected a smaller, qualitative sample based on established criteria. The previous research sample 2 was starting to become unavailable due to limited access to startups and hence a very truncated research sample 3 was formed.

For ease of reference, we will refer to the research samples generated during the pandemic as the quantitative research sample and the qualitative research sample. Data collection, collected through a questionnaire survey and face-to-face structured interviews, took place between May and December 2020.

The fulfilment of the main objective and the partial objectives of the research required the evaluation of the questionnaire survey, which we subsequently decided to subject to statistical examination for greater relevance. We subjected the impact of the qualities and stages of development of the individual blocks of the Canvas business model on the performance indicators of the startup to the most well-known parametric method, correlation and linear regression analysis.

The statistical investigation required a clear determination of the dependent and independent variables in the first step. The dependent variables of our statistical investigation are the performance indicators of the startup, which we determined as follows: Number of users, Number of paying users, Revenue recorded by scale and Revenue recorded directly from the Finstat (2021) financial database. We decided to divide the Canvas business model blocks into two parts in the statistical examination according to the quality of the business model blocks and according to the stages of development.

Theoretical knowledge was mainly drawn from book and journal sources, internet sources where expert knowledge and experience from renowned authors are collected. We mainly used scientific methods, which are analysis, synthesis, induction and comparison. The methods mentioned above have contributed to self characterisation, summaries or comparisons of important findings.

3 Research results

3.1 Research results from qualitative analysis of startups

The questionnaire survey of the qualitative research sample provided us with many new insights and information. The qualitative research sample was really very diverse in terms of industry, we had a representative of almost every area of business, but the largest number of startups (12%) are engaged in computer-related consulting or computer programming, a large number of startups (10%) are engaged in research and experimental development in the field of natural and technical sciences, the same number of startups are oriented towards selling products via the Internet, but in our sample we also find a

representative of carpentry, a representative of the production of other metal products or a representative of other basic organic chemicals. In the questionnaire survey, we also asked the startups we studied about the circumstances of their startup creation and up to 43% of the founders gave us as their answer the lack of market supply, another reason was the ecological mindset influenced by the climate crisis, the impact of innovation, or the need to start their own business.

The current surveyed startups provide their consumers and potential customers with a solution related to sustainability policy, which is the focus of 23% of the surveyed startups. Providing a service is key for 36% of the surveyed startups, and the same number of startups identified meeting the needs of consumers and customers as key.

The need for awareness of customer segments is extremely important in a startup environment, so we asked the surveyed startups about their most important customers. Large international companies form the main customer segment for up to 40% of startups, followed by consumers interested in healthy lifestyles, which is key for 33% of the surveyed startups. In our qualitative research sample, one can find startups that aim to improve the quality of impaired health with their entrepreneurial activities or consumer-oriented startups with mainstream consumer preferences. On the issue of market segmentation, we obtained data that more than half of the studied startups (53%) provide their product or service for a segmented market and the startup is oriented to several segments, however, in our sample there are also startups (20%) oriented to the mass market and a number of startups (13%) create their product or service for a single segment the same number of startups create their value with partial customization.

Startups seek to provide their service or product through multiple levels of communication, with most startups (53%) citing partial contact through an online service as key, personal assistance is key for 37% of startups, startups also use extra personal assistance, co-creation or self-service.

In the survey, we also focused on expansion into foreign markets. Direct export was used or planned to be used by 66% of the surveyed startups, the second most used form of entry is indirect export, followed by the use of a franchise network.

The value proposition of startups requires a combination of multiple resources used, but founders were most likely to cite the use of human resources (63%), financial resources (56%), technological resources (43%), and tangible and intangible resources (63%).

The startups studied in the qualitative research sample were asked about the quality of processes. We focused on the uniqueness, originality or level of processes used in the creation of the value offered. The local level of process quality is crucial for 6% of the startups, national process quality was mentioned by 33% , Central European process quality is essential for 6% of the startups, European process quality is worked with by 23% of the surveyed startups and global processes are worked with by 20% of the startups.

Key partners provide assistance to startups in the form of collaborations in various areas. Up to half of the startups reported that partners provide material resources necessary for the production of the final product, 36% of the surveyed startups receive financial resources from partners, and 20% of the startups use final products from partners. Furthermore, startups use IT resources and implementation technology (23%) or human resources (6%) from partners.

From the cost structure of the startups, we find 46% of the startups report approximately the same costs compared to the relevant competitors, slightly higher costs are reported by 26% of the startups, much higher costs are reported by 10% of the studied startups, slightly lower and much lower costs are reported by 16% of the studied startups.

3.2 The impact of a startup's business model on its performance

The evaluation of the questionnaire requires, for completeness of the data, the addition of a statistical investigation of the relationships between the Canvas business model blocks and the startup's performance indicators.

The statistical investigation was carried out in the statistical program SPSS. Before starting the investigation, it was crucial to define the startup's performance indicators, and we divided the individual blocks of the business model into two large groups according to quality and according to stages of development.

Among the startup's performance indicators, we included the number of users, the number of paying users, sales displayed by scale, and the value of sales directly according to Finstat (2021).

We mapped the Canvas business model to the quality and stages of development groups. The quality group is represented by product quality, customer quality, customer relationship quality, distribution channel quality, resource quality, process quality, partner quality, and cost relative to relevant competitors.

The group of development stages is represented by the degree of product development, the degree of customer development, the degree of customer relationship development, the degree of distribution channel development, the degree of process development, the degree of partner relationship development and the costs compared to relevant competitors.

The statistical examination process was carried out using correlation and linear regression analysis. According to Field (2018), correlation can be defined as, "Correlation is a statistical method by which we can calculate the degree of linear interdependence between two variables." To properly calculate the correlation of two variables, we used Pearson's correlation coefficient = R, which takes values from 0 to 1 and, given a value, can present a small, medium or almost perfect strength of interdependence. For linear regression, it is crucial to correctly determine the dependent and independent variables. The dependent variables depend on the independent variables. In our case, the dependent variables include the number of users, the number of paying users, sales shown by scale, and the value of sales by Finstat (2021). The above variables are dependent on the qualities and stages of development of the Canvas business model.

(A)

Business model blocks	Number of users		Number of paying users		Revenue scale		Revenue FINSTAT	
	Model1	Model2	Model1	Model2	Model1	Model2	Model1	Model2
Product quality	019 (01)	-	001 (02)	-	402 (03)	-	72407 (04)	-
Quality of customers	021 (04)	-	009 (05)	-	024 (06)	-	507712 (07)	-
Quality of relationships with customers	059* (08)	002* (09)	- (10)	- (11)	001 (12)	-	60553* (13)	40061* (14)
Quality of distribution channels	008* (15)	002* (16)	002 (17)	- (18)	408 (19)	-	65402 (20)	-
Quality of resources	006 (21)	-	008* (22)	009* (23)	002 (24)	-	465682 (25)	-
Quality of processes	023 (26)	-	010 (27)	- (28)	411 (29)	-	-71326 (30)	-
Quality of partners	007 (31)	-	014 (32)	- (33)	018 (34)	-	408541 (35)	-
CCtRC*	007 (36)	-	005 (37)	- (38)	024 (39)	-	51701 (40)	-
R	058	050	077	067	042	-	061	019
R Square	033	025	060	045	018	-	037	004
Adjusted R Square	006	019	044	041	-015	-	012	000
Std. Error of Estimate	1.58	1.53	1.08	1.09	1.58	-	2528343	2687118
Sig.	0.329	0.021	0.008	0.000	0.806	-	0.234	0.317

*CCtRC = Costs compared to relevant competitors

Statistical error values are given in parentheses. Sig. < 0.05*. < 0.01**

(B)

Blocks of the business model	Number of users		Number of paying users		Revenuescale		Revenue FINSTAT	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	
Level of product development	1 (1,01)	-	0,44 (1,03)	-	Level of product development	1 (1,01)	-	0,44 (1,03)
Degree of customer development	-0,76* (0,34)	-0,82 (0,34)	-0,46 (0,35)	-	Degree of customer development	-0,76* (0,34)	-0,82 (0,34)	-0,46 (0,35)
Degree of customer relationship development	3,68* (1,31)	1,70 0,84	0,45 (1,33)	-	Degree of customer relationship development	3,68* (1,31)	1,70 0,84	0,45 (1,33)
Degree of development of distribution channels	2,62* (1,43)	-0,22 (0,71)	1,90 (1,46)	-	Degree of development of distribution channels	2,62* (1,43)	-0,22 (0,71)	1,90 (1,46)
Degree of development of resources	-2,18 (1,50)	-	-0,24 (1,53)	-	Degree of development of resources	-2,18 (1,50)	-	-0,24 (1,53)
Degree of process development	-0,78 (1,08)	-	-0,58 (1,10)	-	Degree of process development	-0,78 (1,08)	-	-0,58 (1,10)
Degree of development of relationships with partners	-1,96 (1,26)	-	-0,26 (1,28)	-	Degree of development of relationships with partners	-1,96 (1,26)	-	-0,26 (1,28)
CCtRC	0,17 (0,32)	-	-0,19 (0,32)	-	CCtRC	0,17 (0,32)	-	-0,19 (0,32)
R	0,67	0,48	0,51	-	R	0,67	0,48	0,51
R Square	0,44	0,23	0,26	-	R Square	0,44	0,23	0,26
Adjusted R Square	0,22	0,14	-0,04	-	Adjusted R Square	0,22	0,14	-0,04
Std. Error of Estimate	1,44	1,58	1,47	-	Std. Error of Estimate	1,44	1,58	1,47
Sig.	0,102	0,073	0,553	-	Sig.	0,102	0,073	0,553

*CCtRC = Costs compared to relevant competitors

Statistical error values are given in parentheses. Sig. < 0.05*. < 0.01**

The statistical investigation provided us with a detailed insight into the interrelationships between the Canvas business model blocks and the startup's performance metrics. Model 1 reflects the primary statistical examination and Model 2 represents the statistical examination of the relevant blocks of the business model that showed a significantly correlated relationship with the dependent variables.

The table labelled (a) interprets the statistical examination between the dependent variables (number of users, number of paying users, sales by scale, and sales by Finstat) and the independent variables that characterize the quality of the business model blocks. The table labelled (b) interprets the statistical examination between the dependent variables and the independent variables that characterize the degree of development of the business model blocks.

In the process of statistical investigation, we did not focus exclusively on the relationship between the blocks of the business model and the performance indicators of the startup, but the Pearson correlation coefficient or the Coefficient of Determination, which are part of the regression model, were also the subject of our investigation. In the table labelled (a), we can see that the values for the Pearson correlation coefficient range from 0.19 to 0.77, which reflects the magnitude of the strength of the interdependence between the variables. For Model 1 and Model 2, the dependent variable Number of paying users expresses a very high strength of interdependence for the qualities of the individual blocks of the Canvas business model. The coefficient of determination is again highly significant in the relationship between the Number of Paying Users and the quality of the individual blocks. The value of the coefficient of determination reflects that for Model 1, the Number of Paying Users is 60% dependent on the qualities of the business model blocks. When the statistical re-examination for Model 2 is repeated, this value is reduced and the dependent variable is dependent on the qualities of the Canvas business model blocks at 45%.

We subjected the variables in Table (b) to the same statistical examination and examined the relationship between startup performance and the degree of development of the Canvas business model blocks. The values for the Pearson correlation coefficient range from 0.24 to 0.67. We can identify the greatest strength of correlation between variables in Model 1 between the dependent variable Number of Users and the stages of development of each block of the Canvas business model. The coefficient of determination reaches the most favourable values again in the relationship between Number of Users and the development stages of the blocks. The dependent variable Number of Users is 44% dependent on the stages of development of the Canvas business model blocks and 66% of this relationship is influenced by factors not under investigation.

The linear regression analysis revealed that the quality of customer relationships and the quality of distribution channels have a significant effect on the number of users of a startup. The second dependent variable, the number of paying users, is also significantly influenced by the quality of customer relationships, but also by the quality of resources used in the product manufacturing process. Revenue as rated by the founders on the scale as the dependent variable did not show a significant influence with any block of the Canvas business model. Sales, whose values were reported directly from the Finstat (2021) financial database, showed a significant relationship only with the quality of customer relationships.

Statistical examination of the impact of the development stages of the Canvas business model blocks on startup performance indicators also yielded interesting findings. The number of users is most significantly influenced by three blocks of the business model in equal measure, namely the degree of customer development, the degree of customer relationship development and the degree of distribution channel development. The performance indicator, number of paying users, did not show a significant relationship with any of the Canvas business model blocks examined. Revenue as assessed by the founders on the scale showed a significant relationship only with the degree of process development. The last performance indicator, revenue as reported by Finstat (2021), showed a significant relationship only with the degree of development of relationships with partners.

4 Discussion

The metamorphosis of startups can be characterized as the transformation of an entrepreneurial idea into a real functioning startup that should meet all the prerequisites of a successful enterprise. Startups are unpredictable enterprises for which it is difficult to specify a general recommendation. Founders have a multitude of business models at their disposal, but each startup is unique.

We present the most important findings that we found by evaluating the questionnaires and consider them important enough to be the content of the discussion.

The characteristics of the research samples served to provide an overall picture of our research samples. After taking a closer look at the representatives of the startups according to the performance indicators, we found that startups such as sli.do and Dedoles ranked in all three rankings of the performance indicators. We tried to figure out commonalities and characteristics that might have helped them participate in these rankings. An interesting finding is that both startups reported the same or about the same values in the Canvas business model development stages in the questionnaire survey. The degree of development of distribution channels has sli.do developed at 80% and Dedoles at 90%. Another penetration can be found in the degree of development of the resources used although the values are not very high, but both are approximately the same as sli.do reported a degree of development of resources of 60% and Dedoles of 63%. The last equal indicator from the area of degrees of development is the degree of development of

processes, which the startups reported at the same amount, namely 70%.

During the evaluation of the questionnaires, we found that the founder's previous entrepreneurial experience gives the startup a better and more successful start in the entrepreneurial world. Entrepreneurial experience was mentioned by up to 60% of the surveyed startups, which include startups such as Boataround, Eyerim, Greenway or Virtual Power Labs. A more experienced founder can properly combine their knowledge and insights to the extent that they can ensure an effective business plan, create a functioning team of the right people and thus be able to create a in-demand product or service. Author Jim Collins (2014) explains the importance of having the right people in the right place in his publication, *Companies That Choose to Be Great*. Our qualitative sample demonstrates that prior experience can also have a positive impact on startup performance indicators such as sales. Startups Boataround reported sales of more than 800k euros in 2020 (Finstat, 2021), startup Eyerim achieved sales of more than 6m euros in 2019 (Finstat, 2021) and both were largely affected by the pandemic due to the content of the business.

For startups, creating a product or providing a service represents the main purpose of their entrepreneurial existence. Our qualitative sample of startups demonstrates that startups focus on providing a service and, in equal numbers, on satisfying a customer need. By service provision we mean business ideas that are available to consumers in the marketplace but are not essential to life, and startups seek to improve the quality and standard of consumers through it. The services provided solve a potential health problem, provide optimization of interaction between customers and online stores, enable consumers to charge their electric car. 36% of the startups in our qualitative sample are focused on providing the service. An equal number of startups are meeting a consumer need with their products by providing eye protection, proper cancer diagnosis, solutions to prolonged sitting, healthy foods, or solutions to poor two-way communication. By meeting a need, startups provide consumers with a solution to a problem. It is now of utmost importance to be environmentally friendly as well, which 23% of the startups in our qualitative sample are focused on protecting. These startups focus on sustainability policies that strive to contribute to a decrease in waste, promote healthy lifestyles and support the circular economy.

Customer knowledge is one of the key pieces of information that allows a startup to know what distribution channels will be most effective for each customer segment. For the startups in our qualitative sample, the most important are enterprise customers, large international companies that use the services of startups primarily to improve their own business. The second largest customer group is consumers who prefer a healthy lifestyle. The most important customers also include consumers with common consumer preferences who do not require a special mode of communication or product exclusivity. However, in our qualitative sample we also find startups that primarily target consumers with discerning consumer preferences and have adapted their business model to this customer segment since the beginning of their business.

Identifying the customer segment is important, but not sufficient for the entire life cycle of a startup, one of whose main *raison d'être* should be exponential growth and expansion into the global market. In the questionnaire survey, we focused on the ways in which startups seek to increase the number of customers. Startups most often seek new customers through direct contact, as they consider personal references among consumers to be the most effective way of spreading information. Marketing activities are among the second most used way of acquiring new customers. Targeted advertising, local media, technology development and collaboration are among the other ways that startups use to increase the number of customers. Startup Mr. Bach believes that potential clients will be attracted and retained as loyal consumers mainly by adhering to product quality.

Setting up the right distribution channel requires detailed information about customer segments. In some cases, a startup's problem may not be hidden in the business idea, but in the method of delivery to consumers. Almost every startup in our quality sample provides products and services directly on its own website, through which a potential customer can quickly and easily purchase a product or order a service. The second most commonly used distribution channel is the creation of collaborations with wholesalers or retailers, in which consumers have products available directly in-store. However, quality sample startups also provide the items of their business directly at their own stores or through their own retailers.

Half of the surveyed startups reported that they suffer from a lack of skilled and persistent workers. The previous experience and training received by the workers greatly influences the qualifications that the startups identified as insufficient. If we look at the age composition of startup teams, we find that the vast majority is made up of people in the 25 to 30 age range. These people are nowadays referred to as millennials, not only in the professional literature, who are notorious for higher job turnover. The world's academic literature is becoming increasingly interested in this phenomenon of people on whom the populations of every country in the world are increasingly dependent, but it is all the more difficult to recruit and, more importantly, to retain such people in employment. Millennials can be described as 'unread' people, and their needs and demands are far more different from those of the previous generation. Today, marketers are struggling to figure out a way to reach millennials, to get closer to their mindset, needs, demands and to generalize practices for other companies to reach out to this part of the job market. Based on research in 2018 (Matuščáková, 2018), Cetelem found that millennials are more optimistic than the previous generation and their top priorities in life include family relationships, healthy lifestyle, but surprisingly, stable work came in third place. Therefore, it remains questionable why this generation suffers from the need to constantly change jobs and consequently creates a missing part of one of the most important parts of a startup, without which the existence of a startup is seriously threatened.

During the evaluation of the questionnaires, we drew attention to the possible significant relationship between the quality of the resources used and the market scope. The quality of the resources is judged by the exceptionality, originality or special level of the resources. The founders had the possibility to choose from five resource options, namely local, national, central European, European and global. Batekárň, the first Slovak community re-use centre, has marked the option of local quality and its scope can also be assigned to the city of Trnava or the surrounding area. On the other hand, the world quality of resources was identified by the startup slido, whose most important customers are the world's largest banks and also announced this year a global cooperation with Cisco. Eco-cleaners identified the national resource quality option, which indeed fits the market scope, as within the Slovak space this startup ranks among the top companies providing wastewater and stormwater solutions. We can confirm the observation that it is customers that drive startups to use the highest quality resources. If a startup has the ambition to succeed in the global market, it should also adapt the quality and development of the individual blocks of the business model to a large extent.

When assessing the degree of resource development, the founder paid attention to the degree of completion and sufficiency of the resources used. Surprisingly, more than half (62%) of the startups surveyed reported their degree of resource development at less than 70%. This may be related to the result of the statistical investigation, which showed that the degree of resource development has no significant impact on the startup's performance indicators. The low degree of resource development may also have a negative impact on the economic indicators of the startup and the overall performance of the business. A low degree of endowment or a total lack of it forces startups to form collaborations with external partners, which in turn can have an impact on the overall profit of the startup.

The completeness of the processes can be defined by the scope of the actual operational processes that are covered by the startup. Of the sample surveyed, only 26% of the surveyed startups report process completeness. We consider process completeness to be the identification of a need, the subsequent development of a business idea, the creation of a minimally viable product, the realized market entry, the validation of the achieved results, the production or operational implementation of the idea, the subsequent sale and promotion of the product or service, the distribution of the product or service, and the subsequent after-sales service, which would be included in the after-sales service. As we mentioned in the previous point, whether it is a low level of resource development or process completeness, the missing parts have to be made up by the startup through various collaborations, which may result in favourable revenue figures, but consequently the same startup shows less favourable profit figures. The startups we studied are primarily focused on sales and promotion of goods, as they use external collaborations for production implementation. An ideal example is the startup Octago, which brought an iconic octagonal structure to the market, but the startup does not have sufficient capacity to produce the structures. However, among the startups we have studied, there are also startups that provide all the processes themselves. Such an ideal example is the startup Mr Bach, which imports raw materials from India, Malaysia and Indonesia entirely on its own and does not use any partner for its business. Among the independent startups we can also include Virtual Medicine, Powerlogy, Ecocleaners or Luigi's Box. If we look at their economic indicators through the Finstat (2021) financial database, we find that their values are not as high as those of startups occurring in global markets, but their revenue and profit values are more comparable approximations than those that show multiple collaborations.

Key partners fill in the missing processes for startups in production, distribution, after-sales services, sales and promotion, business idea development or entry into foreign markets. More than half of startups (63%) identified the most important key partner as a supplier that provides the startup with materials or components necessary for product creation. After the supplier of materials and components, startups most frequently identified the investor who provided the startup with funding as a key partner. The entry of an investor into a startup is characterised by the intervention in the share capital and the acquisition of a relevant stake. It is very important to mention that startups also identified more than one key partner. We can assume that it is with such collaborations that they try to cover the funding and cover the scope of completeness of the processes. Collaborations can be characterized as a double weapon - they allow the startup to operate, to provide products and services to customers, but with the question of at what cost. At the beginning of the results of the paper, we focused on the characteristics of the quantitative research sample and to our surprise, the most successful performers by revenue and profit matched in very small numbers. We attribute this fact to the key partners with whom the startups have established collaborations, who enable the startups to create value for customers, but on the other hand have a large share in the amount of profit. If we look at the statistical examination, the quality block of partners has no demonstrably significant impact on the startup's performance indicators. Only the degree of development of relationships with partners shows a significant impact on the performance indicator sales, the value of which we recorded directly from the Finstat (2021) database.

Startup costs represent expenses that the founder must include in his business plan and necessarily count on their existence. The amount of costs influences the profit value achieved. Most of the startups of the qualitative sample demonstrate average costs in relation to the prices achieved. Some startups are plagued by very high costs, but within our qualitative sample we also find startups that show high costs relative to the prices achieved. The purpose of the statistical investigation was to find out whether and to what extent the individual blocks of the Canvas business model influence the performance indicators of the startup. Our findings were again very surprising and unexpected.

Research results are always expected in a positive sense, but the results of the research conducted are not so optimistic.

If we focus on table a) we find that the number of users can be influenced by the quality of customer relationships and the quality of distribution channels. Considering the negative coefficient of customer relationship quality that characterizes that the sense of this coefficient works exactly the opposite. The founders had the opportunity to choose between several options (self-service, partial contact, personal assistance, extraordinary personal assistance and co-creation) and they use personal assistance, partial contact and co-creation most often, but given the negative coefficient, it would be preferable if the startups would soften their focus on this block and leave the customer relationship, if the product object allows it, to the simplest possible communication option, namely self-service. The quality of the distribution channels also affects the number of users, which means the ways in which customers can acquire products. The number of paying users is equally influenced by the quality of the customer relationship and the quality of the resources used in the production of the product. Revenues in terms of scale are not affected by any block of the business model. In this case, we can argue that the Canvas business model does not work, startups are not developed to the extent that this is reflected in the dependent variable. The sales values from the Finstat (2021) database show a significant relationship again only with the quality of the relationship with customers.

If we focus on table (b) we find that the dependent variable number of users is significantly related to the degree of customer development, the degree of customer relationship development and the degree of distribution channel development. The dependent variable number of paying users showed no significant relationship with any of the Canvas business model blocks. The dependent variable sales by scale showed a significant relationship with the degree of process development, and the sales values from the Finstat (2021) database were significantly related to the degree of development of relationships with partners. It is the degree of development of relationships with partners that reflects the large number of external collaborations that we have already mentioned, but again, given the negative coefficient, we can argue that startups form different types of collaborations, but it is the number of collaborations that prevents startups from turning collaborations into performance. They are putting a lot of energy on multiple collaborations at once which unfortunately is not reflected in the right place. The negative coefficient at this level may also reflect the startups' dependence on partners and their increasing aversion to them.

Based on the data obtained by statistical observation, we can argue that the performance indicators of startups are to a greater extent significantly influenced more by the development of the individual blocks of the business model than by the quality of the individual blocks of the business model. Our results could be explained as follows - the individual blocks of the business model have an impact on the startup performance indicators, but in terms of the whole business model they disappear and their significant chance to influence the startup performance decreases significantly.

5 Conclusion

The main objective of the research was to identify the significance of the impact of the Canvas business model on the performance indicators of startups, the results obtained and the metamorphoses of the real functioning startups to contribute to the expansion of the knowledge of this relatively new and promising entrepreneurial phenomenon.

Startups represent a phenomenon in the business world that, although in terms of size can be classified as small and medium-sized enterprises, due to their specific requirements they can be classified as a special form of entrepreneurship.

The research also required working with current literature, as information related to startups is updated almost on a weekly basis. The literature search provided an overview of the most well-known experts and scholars in the field of startup environment, whose knowledge and experience could be called empirical because they come directly from the startup environment. The current literature does not provide a coherent, unambiguous definition of a startup, therefore, based on comparisons of the views of world experts, we worked in our research with businesses that meet the following definition: "a startup is a small business, occurring in unstable to extreme conditions, that seeks to reach consumers by providing a product that is not yet provided by any other competing business, or has been the founder of an innovative idea in the industry."

For the purpose of the research, two research samples were created - a quantitative research sample and a qualitative research sample. Based on the criteria, a qualitative research sample was selected from the quantitative research sample. Both research samples were subjected to a questionnaire survey, but in the case of the qualitative research sample, the questionnaire survey was supplemented by a face-to-face structured interview. The quantitative research sample was of interest to us in terms of the qualities and stages of development of the Canvas business model.

The evaluation of the questionnaires gave us very valuable but unexpected results. Startups largely reported a lack of skilled and persistent workers, which may be closely related to the low age of team members in most of the startups we surveyed. From the evaluation of the questionnaires, we found that the founder's previous entrepreneurial experience may have an impact on the success of the startup. Another surprising finding for us was the large number of collaborations that startups reported, but it is very important to mention that startups also indicated multiple collaborations at the same time. The main partners included an investor, a supplier of materials or components, a supplier of the entire implementation technology or a supplier of finished products. Collaborations can result in low profit values while the startup's revenue values are at a relatively high level. Regarding the profit and revenue values, during the characterization of the quantitative research sample we have identified the best performers based on profit, revenue and number of users we decided to present. From the quantitative research sample, we decided to present the top 10% of representatives, but to our great surprise, only in very few cases did representatives appear as representatives in both the profit and revenue breakdowns. This fact can be attributed to the large number of collaborations that startups indicated. We believe that Slovak startups have an innovative, imaginative idea, but for completeness of processes they require collaborations with external partners who may have their share in the low profit values. The issue of collaborations was also confirmed during our statistical investigation, where we found, based on a negative coefficient, that startups cannot convert a large number of collaborations into the required performance.

Based on the statistical examination, we found that startup performance metrics are more influenced by the degree of development of the Canvas business model than by its quality. We also found from the results of the statistical investigation that when individual blocks have an impact on startup performance, their impact is much more asserted individually than when we consider the business model as a whole. From this we can conclude if one block is developed much more than the others, in an overall sense it will bring almost no impact on the performance. In such a case, the question arises whether to strive for perfect development of all blocks at the same level or to orient one's efforts towards maximum completion of the more developed block.

The conclusion of the statistical investigation is the observation that startups are indeed unsystematic enterprises whose behaviour we cannot predict with certainty. The whole direction of a startup is in the hands of the founder, research can enrich and extend the current literature, but based on our evaluations of

questionnaires and statistical investigation we found that almost every startup operates separately and gives attention to the degree of elaboration of each block differently.

Through our research samples, we contributed to provide a more detailed view of the knowledge from the startup environment; with the right methods in place, we then proceeded with quantitative and qualitative research to extend the literature by linking the Canvas business model and startup performance metrics. The stated objectives of the thesis were fully met, as we were able to obtain not very optimistic significant relationships between the Canvas business model and startup performance through our research.

In conclusion, from the research conducted, the evaluation of the questionnaires and the statistical examination, we have discovered a few areas that could subsequently be the subject of further research. In the startup environment, investigating leadership in the startup team, how the founder influences the team members, or how the funding method used in the startup's early days influences the startup's performance could yield valuable results. An interesting investigation would be to observe the impact of the business strategy on the startup's performance indicators or to provide insights into the external environment of the venture.

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THE BENEFITS AND LOSSES OF ONLINE LEARNING IN THIRD-AGE UNIVERSITIES DURING THE COVID PANDEMIC

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Abstract: Due to the pandemic situation, the online form of education has become widespread in all its spheres. The education of seniors, which is provided, among others, at universities of the third age, has been no exception. Prior to the global pandemic, universities of the third age mainly provided full-time education. However, the new situation has brought new challenges. Third Age Universities have either decided to provide online education or have temporarily ceased their activities. In this paper, we focus on online education during the pandemic at a particular third age university. Based on the results of a questionnaire survey, we present the experiences of seniors with online learning, specifically, identifying the advantages of online education for seniors and the disadvantages of this form of education for this target group. To achieve these objectives, a quantitative research survey was conducted among seniors who participated in online learning at the University of the Third Age in question.

Keywords: University of the third age, senior, interest-based education for seniors, IT technologies, online education

1 Introduction

It is a well-known fact that European society is ageing dynamically. But what does this mean? Simply put, fewer children are being born and the average life expectancy is increasing. The improving health status of the population is leading to more and more people surviving to old age, and therefore to an increase in their numbers (Rabušicová, Kamanová & Pevná, 2010). Both absolute and relative increases in the number and proportion of the population defined as "old" can be observed (Adamec & Kamanová, 2021). The analysis of the age structure of the population from the implemented 2020 census shows a continued increase in the 65+ age group. It has already exceeded one fifth, i.e., one person in five of the population of the Czech Republic was over 65 years of age and the absolute number of seniors has thus exceeded 2.1 million, which is half a million more than in the previous census of 2011. The medium variant of the Czech Statistical Office demographic forecast also shows that in 2030 the number of people aged 85 and over will be 2.4 million, i.e., about a quarter of the population, and in 2050 even 3 million, which will be a third of all people living in the Czech Republic. At the same time, by 2050 the number of people aged 85 and over will triple to almost 0.6 million, which will represent about 6% of the population (Strategy for preparing for the ageing of society 2019-2025).

The trend described above is now widely discussed across the scientific community, not excluding the social and educational sciences. The so-called demographic panic (Vidovičová, 2008), i.e., an expressed fear of the future development of society in relation to its demographic structure, is also discussed in professional sources. But as Petrová Kafková (2013) points out, currently the key response to population ageing is the concept of active ageing, which was developed in the 1990s.

According to the World Health Organization (2002), active ageing is a process in which opportunities for improving one's health, participation and activities aimed at enhancing quality of life during ageing can be optimised. Thus, in this concept, we can talk about living life to the full in older age and having a responsible attitude towards health, living with dignity and safety, and opportunities to participate in social events (Holczerová & Dvořáčková, 2013). According to Haškovcová (2010), at the same time, the concept of active ageing comes with the idea that it is possible to improve the quality of human life in addition to prolonging it. Active ageing also includes respect for the rights of older people to equal opportunities and to participate in social responsibility, e.g., through decisions about community life, etc.

According to recent findings, life expectancy is influenced not only by biological (genetic) factors, but also by social and economic factors. Specifically, these include living and working environment, lifestyle, as well as taking care of one's own health and the level of health care (Wilkinson & Marmot, 2003). Lifestyle includes housing options and quality, daily habits, quality and duration of sleep, substance use, level and duration of stress, physical exercise, as well as dietary habits (Čevela, Kalvach & Čeledová, 2012). The intensity of an individual's physical and mental activity also appears to be important. This area includes sports, hobbies, reading books, visiting cultural institutions or time spent with friends or close persons. Research shows that the listed physical and mental activities help an individual to have proper brain function, which ensures their well-being (Williams, Higgs & Katz, 2012), which could further influence their functioning in old age. Subsequently, other studies conducted demonstrate the link between life satisfaction and well-being as well as education and learning in later life (Formosa, 2014). The results of these studies reveal that seniors can find meaning and satisfaction in their lives through learning (Field in Rute, Porcarelli, 2019). It is the processes of learning that can build networks, trust, reciprocity, and social ties - in general, they can facilitate the socialization of seniors. Seniors' participation in learning activities also appears to increase their physical, intellectual, and social health (Formosa, 2014) and, consequently, their quality of life (Jacob in Rute, Porcarelli, 2019).

Avramov and Mašková (2003) highlight four areas of focus in the discourses of active ageing. The first is prolonged participation in the labour market, followed by active involvement in family life (through housework or caregiving), active involvement in the community (especially through volunteering) and active leisure time (associated with sports or other hobbies). The last area also includes the area of interest-based education.

As mentioned above, the imaginary flagship of senior education is undoubtedly the universities of the third age (Hasmánková Marhánková, 2014), on which we focus our attention in the presented text. The very name of these institutions refers to Peter Laslett's (1991) concept of the third age, which is one of the fundamental ideological inspirations for the development of ideas of successful, productive or active ageing. However, we further narrow down this broad thematic base and focus on the area of online learning. Specifically, we focus on online education in universities of the third age, which has become more widespread in the Czech and Slovak Republics with the arrival of the pandemic situation of 2019-2021 in connection with a significant reduction in the implementation of the full-time form of teaching in universities of the third age, which until then completely dominated. This is not an isolated research, the topic of online learning has been addressed, for example, by Švaríček et al. (2020) and Adamec and Šimáně (2022), who focused their research activities to capture, describe and interpret the perceptions of online learning through online tools MS Teams and LMS Moodle among teacher education students.

During this period, there has been a significant increase in the use of information technology in senior interest-based education, both on the part of educators and the target group. In this paper, we explore the experiences of seniors with online learning. We are interested in what benefits online learning has had for seniors and what disadvantages this form of learning has brought to seniors.

¹ As a result of the Emergency Measure of the Ministry of Health of 10 March 2020 to protect the population and prevent the risk of the emergence and spread of covid-19, the personal presence of students in schools, including the University of the Third Age, has been banned for a significant part of the summer term of the academic year 2019/2020. A similar situation also occurred in the winter semester and partly in the spring semester of the academic year 2020/2021.

The presented paper is dedicated to students of universities of the third age, i.e., seniors. Today, for many reasons, they represent a very heterogeneous group. The heterogeneity of the group of people over 65 years of age, which currently numbers 2 million in the Czech Republic, is not only due to age - the age range can exceed 30 years (Winkler et al, 2016), but also health and the ever-increasing life expectancy, income, level of education attained, place of residence (rural vs. urban), social ties, or one's own activity and life experience play a significant role (Strategy, 2019). Čevela, Kalvach a Čeledová (2012, p. 27) explicitly state that there is no "typical senior". It is worth mentioning that even in our literature or legislation, the concept of senior is not clearly defined. Each of the disciplines concerned with ageing interprets the term senior from different angles appropriate to its needs. Holczerová and Dvořáčková (2013) note that in defining the term senior, sociological aspects are combined with biological and medical aspects, and it is concluded that it is a person in the final stage of life with a specific position in society. There is also no consensus on the age limit for determining the senior age, which varies from the age of 50 in various expert sources. Haškovcová (2010) proposes a consensus on the idea of a roughly 65-year-old citizen. This threshold is also encountered in the outputs of the Czech Statistical Office. For the purposes of this text, the boundary is determined by the age of 50, which is one of the criteria for entry to the University of the Third Age.

As mentioned in the Introduction section, one of the concrete activities that can improve the quality of life in old age is studying. The third age universities, which are part of colleges and universities, are aimed at offering studies to the senior population. Individual universities of the third age usually offer courses of interest that correspond to the areas in which the college or the university has accredited study programmes. It is therefore implicitly assumed that this type of study will reach the university level. Seniors are exposed to the latest knowledge in their respective fields of study. The teaching methods and organisational forms used in the University of the Third Age are the same or similar to those characterising the university.

The university environment is the guarantor of quality in terms of content and methodology. But in the universities of the third age, it is often more than that. It's not just one way to spend time actively and with quality. According to Kalvach and Onderková (2006), a total of six levels of functional fitness can be distinguished in old age, from which different needs arise. Thus, the above mentioned author speaks of elite, fit, independent, frail, dependent and totally dependent seniors. Thus, education at universities of the third age is a kind of imaginary inoculation that tries to keep the senior as long as possible out of the dependent and totally dependent stage. It must also be pointed out that the universities of the third age fulfil the third role of universities, which is now widely demanded. This role is that universities can serve the public very well. In general, the third role of universities includes such activities that aim to improve the educational, cultural, moral, ethical or health level in society.

Research surveys show that the participation of older people in educational activities (not only in the third age universities) is neither high nor sufficient. According to a research survey (Rabušic and Rabušicová, 2008), only 12% of people in the 60-65 age group participated in non-formal education. At the same time, the results of the 2011 Adult Education Survey also indicate that 20.1% of the Czech population in the 55-64 age group participated in at least one non-formal education activity in the last twelve months since the survey and only 5.4% in the 65-69 age group (Dvořáčková, 2014). On the other hand, as the data analysis (Štríbrné..., 2021) of the Information System of the Association of Third Age Universities shows, a long-term increase in the number of seniors participating in education at third age universities can be observed. In the period under review, i.e., since the academic year 2010/2011, when the Information System was launched, we can observe annual increases of approximately three thousand students. From 33 607 students in the 2010/2011 academic year, the number of students has risen to 60 193 in 2010/2019. The number of courses offered

by the individual universities of the third age has increased by 64 percent over the period under review and the number of classes taught by 72 percent. For these two latter indicators, we can observe a gradual slowdown over the last 5 years, which may indicate that the limits to growth have been reached, due to both technical (e.g., classroom capacity) and personnel (lecturer and organisational capacity) capacity.

The covid period significantly affected these long-term trends. The interest of seniors has declined in most third age universities in the Czech and Slovak Republics. Almost from day to day, universities of the third age had to change their teaching forms and ways of working with seniors.

2 Methodology

In the research investigation we conducted, we focused on online learning that took place during the pandemic period at the third age universities in the summer term of 2021. We explored the experiences of third age university students with online learning. In this paper, however, we address only some of the sub-themes of this research investigation. Specifically, we identify the advantages and disadvantages of online education for seniors.

We set the following research questions:

What are the benefits of online learning for students of the third age universities?

What are the disadvantages of online learning for the third age university students?

For the purpose of the research, a questionnaire was designed by the author, which contained 32 questions. These were closed-ended, open-ended, semi-closed and scaled. A battery of demographic questions was included. The questionnaire was distributed online in April 2021 via Google Forms, after the end of the teaching period. It was oriented to the broader issue of online learning among the senior group, their experiences, opinions, etc.

The collected data were evaluated in two ways. Responses to open-ended questions were analysed using content analysis. They were categorized into several areas and then handled by descriptive statistical operations. A similar procedure has been applied in previously conducted studies (Rabušicová et al, 2016; Rabušicová, Kamanová & Pevná, 2011; Adamec & Janderková, 2021). Another part of the data was evaluated through descriptive statistics.

The respondents of the research survey were participants of the online courses of the MENDELU University of the Third Age, who attended the courses in the summer semester 2020/2021. The return rate was therefore 67%. We are aware that we targeted senior students at one particular third age university. Thus, this is a research probe into one distinct environment. The demographic data obtained from the respondents show that the respondents were predominantly individuals from the South Moravian Region and neighbouring regions and seniors studying at multiple third age universities within the region.

If we focus on the basic demographic characteristics of our research sample, it is 87.3% female-dominated (compared to 12.7% male respondents), which is in line with the general trend in gender composition of third-age university students, which is characterized by significant feminization. The age structure of the participants more or less follows the structure of full-time education, with the 62-72 age group being the most represented, namely 66.9%.

Along with the demographic information, it was also ascertained whether the participants had been educated at other third age universities. A full 68% of respondents are graduates of other third age universities besides MENDELU University of the Third Age. At the same time, 62.4% of them are currently participating in other online courses. Thus, we can speak about a group of participants of online courses who are used to being

active in their education and continue this activity despite the change of its form from full-time to online. In addition to the characteristics of the sample, it is important to mention the aspect of the use of IT tools. This area was also investigated by means of several questionnaire questions. We were interested in what devices they used for online learning and whether they had financial costs associated with participating in online learning. The results show that 49.2% of the participants used a laptop for online learning, followed by 37.6% a desktop computer, 9.4% a tablet and the remaining 3.9% a smartphone. It can be assumed that these technologies were overwhelmingly already a common part of their households, as 94% of our respondents had no additional costs associated with online learning. When financial costs did occur, participants primarily associated them with printing the study materials.

3 Main results of the research survey

First, the benefits of online learning for seniors are being presented. It should be noted at the outset that seniors who were registered for the online learning were also allowed to return to the lecture for 48 hours, as a recording of the lecture was made available to seniors. This procedure was chosen with the needs of the target group in mind. In the case of the benefits of online learning, among other things, we asked the open-ended question "What are the benefits of online learning for you?" Respondents were thus free to answer. From the content analysis, the following categories emerged relating to the benefits of online learning for seniors - time availability, physical accessibility, repetition, learning opportunity, and convenience of home.

"Time availability" has emerged as a major benefit of online education for seniors. This was linked to the fact that people saved commuting time through online learning: "The ability to be flexible in daily activities, without losing commuting time." Or "Saving time needed to travel." Making the lecture recording available proved to be a significant advantage. "I could watch the course at any time, not only at the time indicated." or "I don't have to watch the lecture schedule." It turns out that the time flexibility allowed by the set-up of the online system was very positively evaluated by seniors, specifically 31.5% of respondents reported this benefit. Overall, the greatest benefit for seniors is the implemented online learning.

Among the significant benefits of online learning for seniors was "physical accessibility." The following types of statements emerged, "I have hip problems, so having the lectures online was a big advantage for me." Or "Indispensable. I hardly can walk. Dependent to the Internet." Online learning made education accessible to those who, for health reasons, could not attend regular full-time classes at the third age universities. Similarly, there were statements from seniors who were prevented from attending full-time classes by caring for relatives, etc. "Great, or I wouldn't be able to commute anywhere due to caretaking of my husband." In addition to the above, geographical distance to the place of full-time teaching was also mentioned: "I am from the South Bohemia region, so this is a big advantage. Big because I wouldn't be able to commute anywhere." Thus, physical accessibility was an advantage for these seniors, and for some, the cost savings associated with travelling to full-time teaching was associated with this form of teaching: "Financial savings. Otherwise I commute from Ostrava to attend U3V classes." The main benefit of online learning was cited as physical accessibility by 25.4% of respondents.

Seniors cited "the possibility of repetition" as another benefit. This was associated with seniors being able to return to lecture recordings and was mentioned by 16.6% of the respondents. The benefits of this for seniors were multiple: "Ability to play some parts again." and "I could listen to each lecture 2 - 3 times." The ability to replay was also associated with the seniors being able to take notes, etc.: "It is possible to replay the lecture, take notes in peace, etc."

The fourth category was called "learning opportunity". This refers to the fact that online learning allows you to learn and

broaden your horizons: "I can learn even when there is no face-to-face teaching." Seniors also positively acknowledged the learning opportunity itself: "Expanding knowledge." This benefit was emphasized by 11.6% of our respondents.

The last category "convenience of home" refers to some added value of online education: "The possibility to listen to a lecture in the comfort of one's home." For some seniors, this advantage is also associated with a greater possibility of concentration and peace of mind compared to a regular face-to-face class: "I like peace and quiet, and I have that at home with my computer, where I am not disturbed and can concentrate well." This benefit was mentioned by 10.5% of the research participants.

Table 1: What are the advantages of online learning for you?

	Absolute frequency	Relative frequency
Time availability	57	31.5%
Physical accessibility	46	25.4%
Possibility of repetition	30	16.6%
Learning opportunity	21	11.6%
Convenience of home	19	10.5%
None	8	4.4%
Total	181	100.0%

Source: authors' own processing

In the research conducted, it became clear through the analysis of other items in the questionnaire that online learning has other benefits for seniors. In the research we were interested in the IT skills of seniors who participated in online learning, or their assessment of their own IT skills before and after online learning. More than three-quarters of them (87.8%) did not need help to participate in online learning. If participants ever needed help, they mainly asked for help their family members. These were primarily great-grandchildren.

The level of IT skills is also indicated by a question aimed at self-assessment in this area on a traditional school grading scale. One third of the participants (33.2%) rated their IT skills as commendable before starting online education. Participants who rated their IT skills as excellent or good were almost equally represented (25.4% and 28.7% respectively). 11% of participants rated their IT skills as sufficient before starting the online course. The results show that the shift or deepening of IT skills occurred only to a limited extent, with 38.1% of respondents rating their IT skills as commendable, 30.9% as excellent, and 22.7%, or about 6% less, rating their IT skills as good after the course.

The benefit of online learning for seniors can therefore be perceived as the fact that some of the respondents' IT skills improved thanks to more online learning. This may be some added value of online education for seniors.

Table 2: Rate your IT skills (How well can I work on a computer/tablet? and What were my IT skills when the online posting/pandemic started?)

		IT skills - start of pandemic time	Assessment of current IT skills.
Grade 1	N	46	56
	%	25.4	30.9
Grade 2	N	60	69
	%	33.2	38.1
Grade 3	N	52	41
	%	28.7	22.7
Grade 4	N	20	13
	%	11.0	7.2
Grade 5	N	3	2
	%	1.7	1.1
Total	N	181	181
	%	100.0	100.0

Source: authors' own processing

In addition to the subjective evaluation of their own IT skills using a grading scale, in the statement part of the questionnaire

we asked seniors if they agreed with the statement "I have improved my IT skills thanks to online learning." 15.5% of our respondents agreed with this statement and 29.8% of them rather agreed. 17.1% of our respondents rather disagreed and 12.8% expressed disagreement. We also asked whether seniors thought they had to learn new IT skills because of online learning. In response to the following statement "I had to learn new IT skills because of online learning." 12.2% responded with an agreeing opinion and 23.2% responded with a rather agreeing opinion. The other responses expressing a disagreeing opinion, with 22.7% of the respondents stating that they rather disagreed and 24.8% of the respondents stating that they disagreed with the statement, shows that the development of IT skills was not only related to the needs of online learning. It is also related to their willingness and need to learn new IT technologies. When 36.4% of our respondents agreed with the statement "I want to learn something new within IT technologies." Also, 42% of respondents expressed the opinion "rather agree". Their willingness towards expanding their skills within IT technologies is somewhat related to their needs. With the statement "I have a need to continue learning new IT technologies." 34% of respondents agreed and 38.1% said they rather agreed. More detailed results are then presented in Table 3.

Table 3: Express your level of agreement or disagreement with the above statements

		Thanks to online learning I have improved my IT skills.	I had to learn new IT skills because of online learning.	I want to learn something new within IT technology.	I have a need to continue to learn new IT technologies.
I agree	N	28	22	66	62
	%	15.5	12.2	36.4	34.2
I rather agree	N	54	42	76	69
	%	29.8	23.2	42	38.1
I rather disagree	N	45	41	21	26
	%	24.8	22.7	11.6	14.4
I disagree	N	31	45	7	7
	%	17.1	24.8	3.9	3.9
It doesn't concern me	N	23	31	11	17
	%	12.8	17.1	6.1	9.4
Total	N	181	181	181	181
	%	100.0	100.0	100.0	100.0

Source: authors' own processing

Online education for seniors brings with it more than just positives. We were also interested in the disadvantages of this form of education, which seniors attributed to online learning itself. We also subjected the responses to content analysis and categorized them into six categories.

The most perceived disadvantage appeared to be that seniors lacked the personal contacts that regular full-time education allows for them. In online learning, they lacked direct interaction with classmates and the lecturer. The following types of statements were encountered, "I missed direct contact with my friends." Or "It cannot replace direct contact with the lecturer and other participants." This disadvantage was mentioned by more than two-thirds of our respondents, specifically 64.7%. Indeed, online learning denies one important aspect of senior interest-based education, namely the promotion of social contacts.

The second category we named "no disadvantages". Respondents' statements for this category were "none" "don't know about them," or "Given my health problems and the presence of covid, no downside." That online learning has no negatives was thought by 23.2% of respondents.

The other disadvantages mentioned above are marginal compared to the two mentioned above. Some of our respondents (7.7%) mentioned that they would have liked a longer

opportunity to view the recording. They considered the option of 48 hours for possible repeat viewing as insufficient: "Short recording time." Or "I would welcome a longer time span for viewing." Another disadvantage that emerged in the statements was the fact that seniors lacked physical activity if they did not attend full-time classes at the university (3.3% of respondents), and other disadvantages were mentioned by 1.1% of respondents.

Table 4: What are the disadvantages of online learning for you?

	Number of respondents	%
(Lack of) personal contact	117	64.7
No disadvantages	42	23.2
Not enough time for viewing the recording	14	7.7
(Lack of) physical activity	6	3.3
Other	2	1.1
Total	181	100.0

Source: authors' own processing

4 Discussion and conclusion

The above results point to several facts. Online learning has opened up the opportunity to educate a wider group of seniors. Online learning has broken down geographical barriers to learning at the third age universities. Seniors accustomed to learning at a particular third age university were able to take online classes at an otherwise geographically inaccessible third age university. However, the time span availability of online learning through the fact that a recording of the class was also made available was the most appreciated benefit of online learning. More importantly, however, the result points to the fact that time flexibility is essential for seniors due to the fact that they have a large number of other activities. This refers us to the concept of active ageing itself.

More than three-quarters of respondents (87.8%) did not need help to participate in online learning. If participants ever needed help, they mainly turned to family members. These were primarily their great-grandchildren. This result refers to the area of IT skills as an important content component of intergenerational learning not only in the family (Rabušicová et al., 2011). Thus, it is clear that online learning also brought the necessity to learn new IT technologies and seniors were forced to develop their IT skills. Some seniors identified this area as necessary and needed for their further development.

The analysis of the disadvantages of online learning for seniors clearly points to the importance of social contact for seniors that the face-to-face form of education allows. The latter seems to be logically irreplaceable for seniors. Thus, it can be said that online learning for seniors deepens to some extent the social isolation of seniors.

The transition to online learning has enabled the student base of the third age universities to expand significantly. This has enabled seniors to take part in senior education of those who were previously unable to attend face-to-face classes for various reasons - for example, because of time constraints, because they are part of the sandwich generation and take care of their ill partners or parents and/or help to look after their grandchildren, or because of their health conditions. Online learning has also removed a potential geographical barrier arising from the very nature of the organisation of the third age universities. By being part of colleges or universities usually located in larger cities, seniors from smaller towns and villages also had the opportunity to learn. Thus, with online learning, seniors are no longer limited by local availability and can attend an online course originated on the "other side of the country".

What has the covid era brought to senior education? New forms of education have emerged, which until then were taboo in senior education or were used to a very small extent. Seniors who were previously unable to attend face-to-face classes

because of a particular barrier were drawn into senior education to a lesser extent thanks to the online form. Such as caring for partners or grandchildren, or their health condition does not allow them to attend full-time classes. Or geographical distance prevents them from attending full-time education at the third age universities. The pandemic era has therefore widened the target group of students attending the universities of the third age.

Based on the conducted research, the question arises whether there will be a further opening of scissors between active seniors who continue their education and do not mind new online forms and other seniors who have not participated in education so far and new forms of education represent an additional barrier for them. This is certainly an area for further research.

One might assume that seniors would have more time for education (or other leisure activities) given the end of the active employment part of their lives, but the opposite is true. Online education gives them more of the time flexibility they need in senior life. This is because they are often still in the position of the sandwich generation - caring for their often already ill parents while helping their (working) children with looking after their grandchildren.

At the same time, the research shows that the universities of the third age do not only play an educational role, but also a social or socializing role for a significant group of seniors. After retirement, many of them lose contacts from their jobs and look for a new social group to belong to. They then find this among their fellow students at the University of the Third Age. However, the pandemic era has greatly reduced this function of the universities of the third age.

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MULTIDIMENSIONAL MODEL FOR QUANTIFYING ASPECTS OF THE SITUATION - PERSON – TASK SYSTEM

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Abstract: The article focuses on the specification of aspects entering the domains of cognition, reasoning, and subsequent decision-making in different situations. We assume that each situation event is not localized in a static environment but an environment with changing conditions. The primary purpose is to develop a theoretical model to achieve the operationalization of quantifying personality factors concerning the cognitive domain of the individual in the situation-person-task system.

Keywords: information domain, cognitive domain, continuum, event, situation / person / task system.

1 Introduction

We tend to investigate, to study phenomena, i.e. "reality," facts. What usually escapes attention is the environment, space, and "background," context, relationships, and influences, which fall into the domain of ontology, epistemology (or gnoseology or noetics), and philosophy, social sciences, or human sciences. We can quantify what we can grasp, stabilize, measure, weigh, and convert into quantities (Neubauer, 2009, p. 80-82), that, what is accessible to our sense organs and perception, technologies and sensors, techniques, criteria, and methodologies that increase and also strengthen their discernment (Attig, Franke, 2020). We tend to understand as metaphysical or as a "quality" what is beyond the direct distinction and "manifests" or "shows" itself indirectly, through relationships or influences. Identifying phenomena of a qualitative nature is a question of the methodology of the scientific process and agreement on their validity and relevance, similar to identifying aspects of phenomena that are constantly in motion, change, and transformation, whether they are "individual" participating elements - parts, e.g. the situation, person, or role is, or their entirety (Johnson, 2021; Schroeren, 2021).

We have created a multidimensional model for the needs of some aspects of cognition, reasoning, decision-making, and action when solving problems and tasks in different situational contexts. The authors' aspirations and the model's ambitions involve aspects that contribute to critical thinking or that influence the process of cognition, reasoning, and decision-making. At the beginning of the process, perception (reception and perception) cannot be omitted, as well as contributing mental and psychological parameters (related to the "state" of the cognizer - condition). The pragmatic scheme of the process of "reality" - "data/information" - "cognition" - "decision" - "action" is presented by the NNEC model (Víšek, 2005), which proposes a fundamental distinction between three domains - informative, cognitive, and the physical. We consider our model for the informative and cognitive domain of this model as the "background" environment in which the process takes place, in which sub-processes instead of phases can be distinguished with a higher or lower degree of clarity, and we consider them as cognition, reasoning, and decision-making. To make correct decisions and effectively solve task situations, as well as from the point of view of recognizing and applying suitable or practical methods and methodologies for them, it is necessary to reduce ambiguities and also to look for "relatively common" parameters for participating "members" of the "situation" system as a whole. Ambiguity reduction is usually made by definition (quality itself as a phenomenon determined by definition - fact)

or by a model or theory (by reference to the object of investigation, context, or paradigmatic limitation) as a space of "occurrence of quality" or its manifestation or application (Yamamoto, 2021; Farnell, Varela, 2008; Matsuo, Tsukube, 2020).

We understand the presented model as a tool, a reference space for describing the participating "players" in the situation and the process of its transformation, change, and solving problems or related tasks. We designed it as a tool, a diagram of the environment to test potential relationships, co-occurring and interacting influences in various domains and modes. In this sense, the model forms a distinguishing background for the parameters of other, mutually relatively independent domains. We propose it as an environment enabling topological "capture" (location) and "shaping" (morphological template) for the schematic display of captured "data" of participating phenomena, process states (facts of acts, events), and their relationships and influences. We will create the shape of the scheme, the shape of the situation, the event, and the representation of the structure of coexisting and non-inert (i.e. always with some degree of influence) potentially "relative" or "influential - influencing" aspects. It is possible to quantify qualitative data and work with more disparate and unrelated dimensions and levels in the information domain. In terms of the meaning and purpose of information and knowledge for cognition and knowing, for the cognitive domain, in the information domain, it is mainly the ability to distinguish the meaning of differences (Bateson, 2006, 2018, p. 317; Maturana, Varela, 2016; Vopěnka, 2001, 2014). Information in this context can be understood as a double object, data correlation, event (fact/act), whose integral aspects are the mind, thinking, way of knowing (cognitive/mental model), position, attitude, and the "state" or level of the mental condition of the particular perceiver.

Specific related topics that are not the authors' focus include the information concept (content, meaning, origin, formation, transmission /conversion, translation/ and use), the topic of cognitive models, styles, ways and logics of cognition, and the mental and "mobility," thinking of a specific person not only in terms of ways of cognition (cognitive or mental models) on the continuum or in the analytical/heuristic dimension (Hammond, 2000; Kahneman, 2012), but also in terms of its change in the process of cognition itself, and qualitative change through reflection, a reversible process or metanoia (Senge, 2016), which naturally occurs in a changing environment, the space of the system (situation – person – task).

2 Theoretical background

In the cognitive domain, the dimension of distinction dominates, i.e. the distinction ability degree. Another dimension of the cognitive continuum consists of the limits of the general (universal) and the unique (singular), between which the boundary "oscillates," the range currently known both from the point of view of a specific person and the general level of "cognition and knowledge" of the human community (system), its axiological intentionality, and the technological and methodological condition (see more, e.g. in Neubauer 2009; Vopěnka 2001, 2015; Bateson, 2006, 2018).

The meaningful subtlety of distinction and evidence happens on a conscious mental level both by analysis (where it is explicit, obviously relative, graspable, measurable, quantifiable, and calculable) and feeling (where it is present, noticeable, or influential, only technologically and methodologically not/capturable, not/affectable and not/graspable), where the level of significance of differences in states, relationships, and processes is vague, diffuse or relatively insignificant, and unquantifiable, e.g. as for its vagueness (indeterminacy) or changeability (instability), etc. Thus, analysis and feeling form

two cognitive continuum limits (Lin, Lane, 2022; Keefe et al., 2011; Holzberger, Prestele, 2021; Stephan et al., 2021).

The model represents an attempt to establish parametric indicators of qualities selected aspects for critical thinking and the mental condition of an individual when solving problems, making decisions, and acting in various task situations, including those an individual cannot prepare for or apply experience or a proven methodological procedure. In this sense, it enables the description of a situation "without determination" (Bondy, 2009, p. 158-159), i.e. a situation "in itself," suchness and facticity, as an event of happening that is in a state/process of change and transformation. The model allows us both a description of the state and a realistic prediction of the development trend intention since the data/information that is actually "identified" and processed is necessary "the past" and may no longer correlate or correspond with the current state of the system (e.g. due to dynamics and complexity of changes and transformations) and reasoning and decision-making can deviate significantly from everyday reality in terms of correctness. The model enables this event/situation (now only) to be approximated for analysis using selected domains, continuum, and their dimensions, to "characterize" and "parametrize," to convert it into "data" that allow, e.g. comparison with mental or cognitive requirements or psychological and personality qualities, which prove to be potentially crucial for mastering it, or for solving problems and tasks related (Pindešová, Pokorný, Novotný, 2008). In other words, the model enables to search and examine connections, correlations, and potentialities between the characteristics of the situation (environment), the task, the problem, and the prevailing trends of the quality potentials (characteristics) of a particular person (impairment of their degree - intensity and "coherence") or the human system potentials (Biggs, 2022). In specific ways, it can contribute to the formation, transformation, development, or retardation of the cognitive possibilities of a particular person or human system, the transformation or corroboration of knowledge, valuable methods, and methodologies of cognition and reasoning for decision-making and action (Farshid et al., 2021; Rowbottom, 2008; Matsuo, Tsukube, 2020).

The model is based on assumptions of an ontological and epistemological nature, subsequently reflected in preferred philosophical, psychological, and other related field-specific modalities. An ontological background, as well as the gnoseological one, allows us to "untie" and "release" from the traditions of the mesoterraic way of thinking and the tendency of "continuity" with authors and authorities, be it models and ways of thinking formalizing the subject of being and the existence of phenomena, things, states, and processes, the topic of an individual and human systems, or the topic of "linear" transmission of knowledge, cognition, and their results tending to consider some problems as solved, issues as thought out and invented or some questions as answered and ambiguities as explained, with implicit or explicit claims to truth or probability (Neubauer, 2009; Blumenberg, 2015; Horyna, 2020; Petříček, 2009; Fernández-Izquierdo, García-Castro, 2022).

The ontological context is inspired by systems competing with substance models, be it the legacy of Neubauer (2004, 2009, 2011, 2017), Hempel (2015), or selected aspects of the concept of non-substance ontology (Bondy, 2007, 2009; Kužel et al., 2018), philosophy of living nature by Kratochvíl (1994), specific aspects of the concept of processual philosophy of nature and Whitehead's metaphysical system (Andrle, 2010), or thinking about thinking (Heidegger, 2018), thinking in the language of Wittgenstein (2007, 2019), thinking in images (Petříček, 2009) or thinking in metaphors (Blumenberg, 2015; Lakoff, 2006), perception or memory, process and state, movement, matter and time, or freedom, truth, probability and other topics (Bergson, 1947; Blumenberg, 2015; Petříček, 2009). We drew inspiration of an epistemological nature mainly from the concepts and theories dealing with the mind and thinking (Rorty, 2012; Kahneman, 2012), reasoning (Hammond, 2000; Kostroň, 1997; Kahneman, Sibony, Sunstein, 2021) or decision-making in static and dynamically changing conditions, asymmetric operations and postmodern conflicts (Paparone, Crupi, 2002).

The background and inspirations are justified. Egon Brunswik's model of probabilistic functionalism, Kenneth R. Hammond's concept of the cognitive continuum, and the concept of non-substance ontology or procedural epistemology have proven themselves both in everyday situations, conditions, and circumstances, as well as non-standard, and in situations of reasoning and decision-making under uncertainty of conditions and circumstances, characterized by a high degree of dynamics development, including changes and transformations of the system's internal and external environment in the process of achieving the "goals" of the mission, as well as the high degree of complexity of relationships and influences, or the "globality" of the consequences on the system or its environment (Bocklisch et al., 2022).

The dominant idea behind the model is the existence of a "bare - pure" situation, or better a "situation without determination," as the state of the entire system in the process of its being in the environment (space) based on the concept of nondual non-substance ontology (Bondy, 2007) following in some respects Whitehead's way of thinking (Andrle, 2010). This allows working with dual or double categories such as event (fact-act, state-process), a thing (object-subject), noninertial (sequence - continuity), and others, and identify their "position" parametrically on different types of continuums and their dimensions. Following Whitehead's sense and meaning of the term event (fact - act), the event includes both the static and dynamic nature of the situational reality (system as a whole), (Wühr, Richter, 2022).

These categories always differ from the specific relationships, influences, and interconnections that occur. They arise and develop ad hoc, according to environmental conditions, under specific circumstances and can be considered as so-called morphisms (Sheldrake, 2002, 2017), which have normative potential (Bondy, 2009), and which fulfill the analogous function of events, as objects, in various environments. The ontological background naturally and factually has the ultimate characteristic, feature, or manifestation of "the being of any reality," representing "freedom." Only the degree of freedom determines the form and character of the system as a whole (situation-person-task) on the two limit continuums establishing the possibility of differentiation we use in the model.

The model considered in this way makes it possible to relate "parametrically" and evaluate qualities in various domains, continuums, and levels of a specific environment (conditions and circumstances of the situation and task), which place specific demands on, e.g. aspects of the personal psychophysical and mental condition of a specific person, aspects of his cognitive condition or the relational condition of the human system participating in the event. Also, this model enables to process of data from various sources, information, and "insights" of various "types" of observers (from various relatively separate and unrelated domains and their levels) from various positions (points of view) and establishes relatively accurate "coordinates" considered or ascertained quality in a specific system, and thus "quantify" (Bondy, 2009), formalize it as a variable, objectify and hypostatize it as a quantity (Neubauer, 2009).

The proposed model follows a systemic thinking approach and understands systemic thinking as comprehensive, holistic, and interrelated, in which both insight and overview are simultaneously present. It includes the whole "system" of person - situation - task, and its interrelationships, context, and by its character, it mimics (imitates) the "background" of quality phenomena manifestation. In this sense, it is undoubtedly afflicted with varying heaviness, vagueness, and unaesthetic. However, it allows us to apply currently available methods with the ambition of parametrizing these qualities in some form. It works with the levels, continuums, domains, or characteristics that are to a certain extent inherent to both phenomena and situations, conditions, and circumstances or are an aspect of them. Each member mentioned above, including the relationships between them (which also become "phenomena") to a certain extent (however vaguely and relatively

"subjectively"), valorize (appreciate, evaluate), i.e. materialize and quantify. Simple, one-dimensional criteria are insufficient, and their modeling requires bipolar continuums defined by limits and possibilities offered by mathematics, statistics, and modern data processing technologies. This allows other factors to be "involved" in the game, which is naturally involved in the inferential, i.e., critical thinking of a concrete cognizing human being (whether it focuses on the current or the future), but mainly falls into the irrational or "metaphysical" domain. The degree of correlation, i.e., the correlation between different, ostensibly unrelated categories of qualities, can thus provide more reliable information of a "higher" complexity about the phenomenon that is the subject of our interest, and in this sense, no matter how currently oscillating (point = space/environment of occurrence; i.e., not a static "place" in a permanent space), however, topologically (spatially) more permanent or "stable" (spatially more "certain or determinable - more targetable") as a parameter and indicator that a given action (judgment for decision-making) is most often manifested in a specific individual from the "sets" (singulore) of the model's environment space (Schwaninger, 2006; Cabrera, Cabrera, Powers, 2015; Cabrera et al., 2018).

The pragmatics of the model is considered on three levels. A model conceived in this way goes beyond the limiting epistemological possibilities based on sensory knowledge (data) and expands them by the technological and methodological equipment available (Bondy, 2009), including (thanks to the development of modern computer technologies) the possibility to apply multi-valued, fuzzy, or other types of logic. The second level, following the previous one, is the ambition to overcome the limitations of ontological models, according to which something is either material, i.e. tangible, in the sense of being grasped by measurement, weighing, or calculation, formalized with the help of variables and measured through quantities (put into ratio, i.e., rationalize and therefore objectify) and count (calculate). Or a phenomenon is non-material, elusive, unmeasurable, uncountable, and therefore irrational, and non-objective, suffering from the "vagueness" of definition, non/clarity of contours, non/certainty of forms, or "non/sharpness" of boundaries and limits, the absence of categorization, or even being outside our "objective reality," or „beyond“ its horizon (Husserl, 1993; Vopěnka, 2001, 2014, 2015; Neubauer, 2009). The third level represents the assumption that the model enables to overcome the burdens of psychophysical parallelism, anthropocentric or socio-centric concepts from the point of view of finding the "correct" way of realistically solving a problem (task) by a specific individual (human system), with the least possible energy. In this context, the model accepts the "heuristic mode" and the concept of "situation without determination," i.e., it includes the assumption, the possibility that an individual (human system) naturally behaves and acts in a given situation also teleonomically, normatively and axionomically, "from within" and the environment of the situation, self-creating and co-evolving in the process (i.e., non-inert, autopoietic, self-organizing). This authenticity and autonomy mean that the external criteria are understood as proposals, opportunities, possibilities, frameworks, and limits, not as limitations and givenness (circumstances are relative); conditions are more or less "given" (Wiedermann, 2007; Iba, 2010, 2011; Letelier, Marín, Mpodozis, 2003).

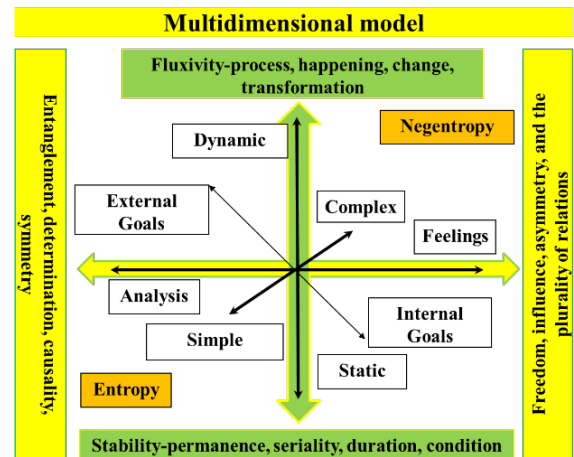


Figure 1: Schematic concept of the proposed model.

The model structure consists of both one-dimensional and two-dimensional bipolar continua. We propose a bipolar or binary continuum; however, we convert them into unidirectional scales for mathematical and statistical data processing into indices and coefficients. This allows scales to be understood and used in different ways, parallel, binary, polar, symmetrically or complementary, or even compensatory (not mutually oppositional on mutually exclusive, but potentially co/referential or co/influential). The dimensions of the considered continua are genuine in the sense of being naturally given, inherent, to all subsystems of the whole (situation - person - task/problem as well as to the whole itself and its internal and external environment. The three-dimensionality of the above schematic representation refers to the multidimensionality of the model. Similarly, as in a two-dimensional (planimetric representation) of space, we can depict an unreal three-dimensional object and suggest processes that do not correspond to our empirical experience or the reality of our world (water "flowing" upwards). The spatial complexity of the whole "system" of situation / person / task-problem can be indicated by three planes perpendicular to each other. However, as the system's complexity grows, which can again be indicated by additional planes with mutual intersections, the three-dimensional (stereometric) representation of the model space becomes misleading.

Thus, it is necessary to understand the environment of the "system" as a happening event (fact/act, process/state) in the sense of the actual intersection of causalities of phenomena and correlations of relations and states, potentiality of influences, for further possible reasoning or prediction of probable continuity - succession, in the sense of problem-solving - a task that is more or less correct, expected, desirable or not. The model conception is close to a "mathematical point" that can at least represent the unique degree of coherence, homogeneity, and self-identity of the system as a whole (Biagioli, 2020; Bondy, 2009; Hofer et al., 2022; Townsend, 2008; Biggs, 2022).

This mathematical point of "higher complexity," which we call singulore. The term singulore expresses the situational singularity (bipolar singularity) of the state of the entire situation, of an event in the process of its existence, it is happening. In meaning and sense, it approximates Whitehead's concept of the event. It is then a reference point (Whitehead, 2010) of a concrete, unique system (situation - person - task), a kind of "intersection" (however, only an environment/space of concentration) of all possible, conceivable, and graspable, co-participating levels, relationships, and influences, and therefore also the "center," the center of gravity of the "event," the "punctus" (Barthes, 2005) of the image of its model. Indices and coefficients obtained using the model are then some kinds of "state" quantities around which the "state" of the system as a whole "oscillates" in the process of its being with a greater or lesser deviation from the central position (equilibrium value). If we place these "centers" linearly behind each other in time, a

"hollow" spatial line is created, within which the whole system develops and transforms in time, as well as each of its "parts."

In the "center" of this "hollow line," the envelope of which is made up of the updated positions, the states of the system's co-members, and the limits of the states of the system as a whole (an analogy is created with strange attractors behind each other in time), there is a place - the space of the "highest" density of the internal relations of the whole "center", „center of gravity“. The center of gravity also changes over time, and its position and shape in space relate to the internal and external environment development. That space, which we call the clumsy term "center of gravity," is ultimately considered as a "point" that can be placed - marked in the space of the model. This "point" has a different degree of "density," "stiffness" given by the "distance" of the three "centers of gravity," i.e., the subsystems of the whole (person - situation - task), and a degree of their own "density" in terms of individual dimensions, and thus "sharpness," the accuracy or certainty of their limits (boundaries), in the space of the model. The term "center of gravity" is therefore only an additional one, as it is only a "spatial model," where "space" is made up of designed or user-applied dimensions of the model. Its disadvantage also lies in semantics, which evokes the idea of weight. The term center also has a similar semantic disadvantage, which can evoke the illusion of control or even manipulation of the entire system (Bateson, 2018). We perceive these changes as movement, acting of the entire system in the environment. The graphical representation of this "movement", i.e., the being of the entire system in time in autopoietic systems becomes a relatively "circular" form, probably due to the reversal effect of reflection (Blumenberg, 2015, p. 181). The direction of development of the entire system is determined by the character and meaning of each specific event in its existence.

The specific situation of the system as a whole in the form of a "center of gravity" is a relatively "permanent" point from which the actual recognition, reasoning, and decision-making of a specific individual take place. However, this point (space) is still "changing" in the same way as cognition, reasoning, and decision-making, which in reality both happen by themselves (and thus also transform themselves) and happen in a changing external and internal environment. The impact of partial parameters or factors in the permanent transformation and change of events is the topic of the proposed model, which helps to pay attention to those parameters of characteristics that are significant and similar for all participating, co-participating, or interrelated aspects, "co-members" of the whole system. The epistemological (gnoseological, or noetic) initial assumptions for the creation of the model draw inspiration, e.g. from the concept of "probabilistic functionalism" (Kostroň, 1997), the continuum concept by Vopěnka (1989, 2001, 2014), and the theory of the cognitive continuum (Hammond, 2000), as a possible proposal that allows using the potentials of both coherent and correspondence metatheory, as well as from Whitehead's procedural, or organicist approach (Andriele, 2010), cybernetics, and system and information theory (Bateson, 2018), which we understand as meaningful and useful alternatives to traditional mechanistic concepts.

A specific individual or human system, as a whole, in terms of stability, constancy, change, or even transformation over time, happens, i.e. as a whole "lasts," remains what it is, however partial and more complex changes happen, they do not have partial parameters a "jump" effect on the position of its "center," center of gravity. The change can be noted as a change in the position of its center, the center of gravity in the model. The whole is by its nature inert and constantly "adapts," either unconsciously (reactively, for example, by following some external rules or values) or consciously (learning systems) and proactively (it creates rules, values, or methods in the process). An example of a proactive, hyper-adaptive human system approach is an authentic professional individual, leader, or team in the complete sense of the word.

The most profound cognitive background of the model is based on two continuums, the continuum of duration and relation, in

which aspects of any fact, reality, nature, or naturalness are "projected." A characteristic feature of the continuum of duration, whose dimensions are permanence x fluxivity, is temporality, permanence, or duration, describing the relative constancy of a phenomenon in "time" and transformation (change). In the maxim of steadiness, it is relatively inert immobility of elements (members, relationships, and the entire system). In physics, it represents the ideal of a solid body, point, or system (a mechanism). The dimension of constancy is described by terms such as rigidity, atelic repetition, identity, and totality. The dimension of fluxivity is characterized by the degree of complexity of relationships and influences and the dynamics of their changes and transformations. In the maxim of fluxivity (flexibility, change, transformation, flow, process), it is pluralistic, non-inert proactivity as a metaphor for compassion in the sense of non-inertness, and conscious action, self-regulation, auto-dynamics, and autopoiesis (Bateson, 2006; Maturana, Varela, 2016; Wiedermann, 2007; Iba, 2010, 2011; Cabrera, Colosi, 2008).

The maximum of the limit of one pole of the first dimension of duration is the "strength" of the object (state) of the system as a whole, and the second maximum of the limit is fluxivity, flow, fluidity, and duration in transformation, i.e. process. We understand the concept of duration in its duality, where at one pole, the permanence of the object comes to the fore with the analogy of an abiotic "solid," static body, and at the other pole, duration through constant transformation and change with the analogy of a biotic whole (social system) in time and space. Within this continuum, one can observe various variants of process perpetuation or "cyclical" repetition of relationships, positions, algorithms, and influences of the entire system. The topic of distinction at both extremes of the continuum is then the character of the "density" and homogeneity of the system as a whole, either the density being homogeneous or heterogeneous.

A characteristic feature of the continuum of relation, the dimensions of which are "boundness" or freedom, as a measure of "freedom," the form of which is the "tightness" and constancy of relations, bonds, and influences. In the maxim of binding, the dominant feature is continuity, succession, predetermination of the future state, rigidity of the procedure claim, and method in the sense of radical causality. Deviation takes on the meaning of a mistake. The system is internally/externally "closed" (law, norm, definition, criterion), and the system learns in the "matrix" (externally established rules). In the maxim of the dimension of freedom, the dynamics and strength of bonds are variable. The topic of distinction in this continuum is whether the whole tends towards entropy or negentropy at maximum fluxivity. The effect of the limit of this maxim can be either the entropy of the homogeneous (fog), the entropy of the whole (bond to decay / death / the whole of the system/organism), the negentropy of the heterogeneous whole in the sense of qualitative self-transformation (autopoiesis, a system learning in a process), rules, methods, and goals in the process of development. They create a situation, a whole system (situation-person-task). The system is relatively "open," the deviation acquires a new meaning, possibly a mistake, and the non-inert, on the necessity-opportunity-possibility axis, "moves" differently, in contrast to a relatively closed system.

The result of these initial dimensions is the fact that each specific situation "right now" (only now), the whole of the system, has a potentially particular level of degree of freedom and degree of "urgency" of the need for a "solution," i.e. demands reception, cognition, reasoning, and decision-making, which, depending on the conditions and circumstances of the environment, can acquire the characteristics of spontaneity, complex and dynamic transformations and changes in a specific situational reality, or strategic reasoning and decision-making, or the forced application of predetermined algorithms of cognition, reasoning, and decision-making. Another result is the fact of the possibility to change the "direction" of the vector of subsequent development by reasoning and decision-making and shifting the "center of gravity" of the entire system to a more "advantageous" position for the whole itself and the environment. The last result

represents the possibility of changing the cognitive, concrete person's internal (cognitive) attitude in the situation.

3 Methodology of the paper

To define the model we employed theoretical desk research with the application of paired methods such as induction and deduction, and abstraction and concretization. Induction is in comparison with deduction focused on the development of general results from specific situations. Researches include induction for the generalization of hypotheses, e.g. in a questionnaire survey. The deduction has become a process, which passes from general principles to specific – derivation of particular findings from general bases. The deduction is usually used in cases with appropriate theory, which leads to a prediction of application-specific theory in a new situation (Myers, Hansen, 2011). Abstraction has become the method by which is separated unimportant characteristics. That leads to observing the general characteristics of the analyzed element. The Concretisation method is focused on the application of fundamental and general characteristics of elements onto specific groups of effects, belonging to special class elements (Kelnarová, Matějková, 2010).

The model's basic structure of capturing the characteristics of the situation - person - task system, as well as for describing organizational units, consists of three levels - continuums, which contain the dimensions of static - dynamic, simple - complex, and analysis - feeling. Continuums vary in meaning (correlation), similarity (correspondence), or analogy. They are "unidirectional" or polar, opposite, or even mutually opposite and "excludable" in a given specific context or task situation. This exclusion is not fatal; it only represents a necessity, determinism (symmetric linear causality) becomes opportunity (asymmetric - acausal change) or "deeper" than possibility (transformation), and relatively most profound potentiality (transformation into another force-power quality).

The continuum with static-dynamic dimensions is based on the dualistic concept of state/process. The maximum of static represents immutability, constancy of a phenomenon, stability (algorithm ability) of a process or cognitive methodology, or organizational algorithm in Chronos-type of time. They are represented by product, clone, standard, and algorithm. The maximum dynamic represents not only a change in a phenomenon, a process in time (Kairos-type of time), but also its transformation of both a quantitative and qualitative nature, be it "slow" or fast, requiring quick decision-making and action, a reaction leading to a solution to the situation, or requiring a complex prognosis and "reset of circumstances," including value frameworks, resulting in a change of context, the qualitative transformation of the entire system (permanent situational change/transformation).

The continuum with simple-complex dimensions is a dimension for capturing relations (relationships and influences), whether symmetrical, deterministic, causal or asymmetrical or acausal. The maximum of the simple further represents a meaningfully indivisible "unit," whole, state, process, phenomenon, "and self," thing/event (fact/act, or the entire event). The maximum of the complex represents the "meaningfully" indistinguishable interrelatedness and unrepeatability (uniqueness) of the entire phenomenon, state, and process (tightness of situation-person-task-context relations), "suchness" in the complete sense of the word "now and here," right now (now only).

In the context of the cognitive domain, the place of "movement" in the cognitive plane of a particular perceiver (Ambrozová et al., 2016), his mental mobility in the sense of the ability to engage and change the cognitive attitude (Petříček, 2009) appear to be "core." The cognitive continuum with the analysis of the dimensions - of feeling is based on the concept of psychological functions according to the proposal of Jung (2020) and the concept of the cognitive continuum, according to Hammond (2000), which follows on the probabilistic functionalism of Brunswik (Kostroň, 1997). The maximum of analysis

characterizes an environment with apparent (differences), obvious parameters that can be identified and quantified by various methods of exact sciences, structured, categorized, i.e., expressed in terms of some formalized language, or using agreed categories of specific systems (e.g., institutions and corporations).

They are represented by axiom, definition, law, truth, accuracy, calculus, ratio, scale or measurability, quantity, experimental method, objectivity, or symbol (unambiguity). At the maximum of analysis, sensory perception and rational functions in thinking and cognition dominate. The maximum of intuition represents an environment whose characteristics are not/apparent, vague, difficult to quantify, objective, measurable, calculable (countable), and categorizable, differences (as sources of data and information) are not/distinct, not/apparent, not/clear, not/concrete, and non/stable. They are represented by concepts such as feeling, which, in the language of Jung's analytical psychology, describe the natural, irrational functions of the human mind, as well as concepts such as vagueness, fuzziness (Vopěnka, 2015), quality, meaning, sense, method of observation, subjectivity, "probability," image (Petříček, 2009) or "symbol," in the sense of non/obvious, referring "to," pointing "to" (Cassirer, 1996a, 1996b), metaphor (Blumenberg, 2015; Horyna 2007; Lakoff, 2006), possibly, in the language of Brunswik and the lens model concept, also "a hint" (Hammond, 2000; Kostroň, 1997).

Within this continuum, cognitive procedures (methodologies, methods, and logic) or epistemological tactics and strategies, based on coherence or correspondence metatheories (Hammond, 2000), applying procedures known as induction (Bíba, 2019), or deduction, or ways of thinking in terms of cognition, reasoning, and decision-making, adequate to a situation, task, and context (Paparone, Crupi, 2002). This application is closely related to the level of mental or cognitive condition of the cognizant and its flexibility (Bateson, 2018) concerning the conditions and circumstances of the situation, task, and environment, including the organizational environment, in terms of the ability to change style, method, model, as well as position and attitude in the process of cognition.

4 Results

The model can be supplemented as needed and according to the specificity of the user's interests and intentions added with levels, specific dimensions continuums for a more refined distinction, as well as dimensions that affect aspects that contribute to the processes of cognition of a specific person, i.e., his mental mobility. The explanation and graphic expression of the qualities assessment of the situation – person – task system and its sub-elements, using the model, can therefore be varied, again according to the specific characteristics of the assignment (contract) or of the entire system itself, e.g., the continuum inert - non-inert; causal - acausal; rigidity - flexibility; closedness - openness; routine - unique; emergence, risks and more. Data processing using the model works in three phases or levels. See Figure 2.

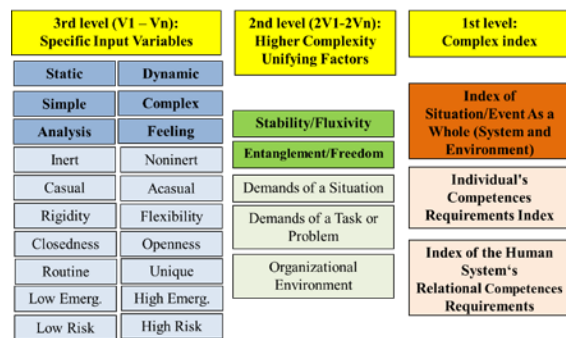


Figure 2: The visual image of the final model creation.

Individual levels of the model can be expressed mathematically. The calculation principle assumes that each variable has a specific weight within the partial level and in the complex form. The coefficient β can express the size of this weight; at a given level and in a given group, the sum of these coefficients equals 1. The balancing coefficient C can also be added to the given equation, which can be optional depending on the specific situation.

$$\text{model}_{3rd\ level} = \beta_1 \times V_1 + \beta_2 \times V_2 + \beta_3 \times V_3 + \beta_4 \times V_4 + \beta_5 \times V_5 + \beta_6 \times V_6 + C \quad (1)$$

$$\text{model}_{2nd\ level} = \beta_1 \times V2_1 + \beta_2 \times V2_2 + \beta_3 \times V2_3 + \beta_4 \times V2_4 + \beta_5 \times V2_5 + \beta_6 \times V2_6 + C \quad (2)$$

Where
 $\beta_1 - \beta_6$ – coefficients expressing the variable weight in the determining factor.
 $V_1 - V_6$ – emerging groups of variables.
 $V2_1 - V2_6$ – emerging groups of variables.
 C – balancing constant.

Table 1 shows the model application examples. The values represent the output accumulation of expert evaluations of a specific professional situation of an emergent, crisis nature and the organizational environment of a corporate (institutional) nature company.

	Emergent Situation	Corporate Environment
Static	2	8
Dynamic	10	3
Simple	8	4
Complex	3	9
Analysis	3	9
Feeling	8	3
Inert	2	9
Noninert	9	4
Causal	4	9
Acausal	9	3
Rigidity	2	8
Flexibility	10	2
Closedness	2	8
Openness	10	4
Routine	2	9
Unique	9	2
Emergence	10	4
Risk	9	4

For evaluation, we used a scale from 1 (minimal) to 10 (maximal)

Tab. 1: Example of model application

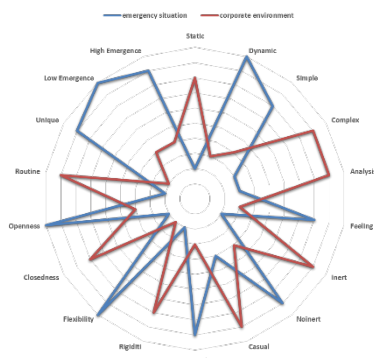


Figure 3: Graphical data representation for the third processing level.

An essential aspect of the model is the fact that continuums can be converted in terms of working with people and human systems, their recognition, preparation, and development into factors of mental, cognitive, psychological, personality, or social condition determined by standardized, valid and reliable

methods of psychological, sociological and other diagnostics. The model output, mathematical and statistical data processing are coefficients and indices, such as:

- Coefficient of situational requirements.
- Coefficient of the task/problem requirements and their solution.
- Coefficient of the organizational environment requirements for individuals, micro-teams, partial, relatively independent/functionally, and activity-specialized/organizational units.
- Index of the situation/event (system and environment) as a whole.
- Index of an individual's competencies requirements in modalities:
 - a) Cognitive competencies and mental condition (cognition - reasoning - decision making).
 - b) Psychophysical condition (perception and action).
 - c) Social condition (communication, relationships, cooperation, and leadership).
- Index of human system competencies requirements (functions, activities, communication, and organization of relationships).

Subfactors of coefficients and indices are not understood as mutually opposite. Indices and coefficients are thus rather specific conglomerates of obvious (self-evident) factors (condensates or specific "fusions") whose existence is naturally possible for every situation, person, or task but occurs in varying degrees of representation. The relative "stability" of coefficients and indices is also determined by the fact that any significant change in a sub-parameter can (but does not have to) have a significant effect and can (but does not have to) be compensated in the "entire" system and the whole of quality manifestations by changes in the parameters of other dimensions or domains. The system occupies a "relatively" constant position in the environment. However, its sub-parameters and their relationships change more or less situationally. Indices and coefficients enable to work, e.g. with continuity in the sense of a causal connection, as well as with discontinuity or with a weak or vague correlation. The fact that there is no correlation as a measure of the closeness of the "occurrence" of phenomena A and B, as well as causality, correlation/succession, or continuity, does not mean that there is no correlation and the absence of any influence. The factors of "influence" instead of correlates contribute to both the occurrence of an event and, e.g. "the tendency" of a specific individual to tend to a particular way of thinking, cognition, reasoning, or solving situations and problems. For example, from the point of view of the index of an individual's competence requirements, it is necessary to work with several modalities. Only in their "cumulation" does the significance level appear in higher complexity factors.

The authors introduced indices and cumulative factors because it turns out that the higher the level of factors, as "cumulative" values of specific input variables, for a given individual, the more robust or more reliable the assumption of his ability to make correct decisions and act effectively in a situation and task, as well as the inclination or tendency towards the character of the environment or profession.

Conclusions

The ambition of the authors of the model is a functional design of a schematic representation of the "universal" aspects of "things" (phenomena, states, processes) to achieve the uniqueness of the entire situation - person - task system in its complexity and dynamics. The model is considered as a possible variant of the coexistence of Mathesis Universalis and Mathesis Singularis, which can be used either for transfer (meaning, sense) or translation or transition between the general, obvious, apparent and exceptional, unique given of the event (Whitehead, 2000, 1970; Andrie, 2010; Townley, 1995) of a specific system unit (Petříček, 2009, p. 128-148). The model also serves as

cognition, grasp, and understanding for meaningful reasoning, correct-realistic decision-making, and valuable and practical actions. The basic dimensions of the model are related to the conditions or parameters of the cognitive continuum, i.e. the environment in which an individual's mind and thinking move, in terms of cognition, reasoning, decision-making, and action. The continuity of the dimensions of the model enables us to perceive the being of the person-situation-task system as an ongoing, relatively stable environment, i.e. a more or less dynamically developing process in its "constancy," as a "search" for the optimal state of relations between the given, natural, spontaneous, and necessary, intentional, voluntary (Blumenberger, 2015), i.e. "oscillating" in the dimensions of static versus dynamic, simple versus complex, and "oscillating" in terms of psychological functions and personality aspects involved in perception, cognition, the reasoning for decision-making and conscious actions of a specific person or human system.

Coefficients and indices, proposed with the use of the model for specific organizational units, situations, individuals, events, and tasks, are then considered as relatively "stable intersections" of domains and dimensions, intersections of "observation" of all aspects participating in the event (including identifiable subsystems as units) in relationships (however their states belong to different domains), while these "observations" also transform themselves, as relating in the event of this relating. Dimensions contain or represent the natural structural aspects of "every" potential "thing" (phenomenon, state, process), event (Andrle, 2010), or "situation without determination" (Bondy, 2007, 2013).

However, it is not data or information in an exact form (according to methodologies and methods of exact sciences), expressed on a one- or two-dimensional scale, but rather something like a cluster of data relations, a complex set of relations and influences, or in other words a higher "topology" the frequency (density) of the occurrence of manifestations of qualities and their degree or intensity in an object (element, individual or system as a whole) in the space of our model. We can consider the analogy of "center," "center of gravity" in the sense of the degree of "density," and the analogy of "vector" in the sense of the tendency or intention of the development "direction" of an event, a phenomenon, a system as a whole in the environment, which creates its way of being. We called this "virtual multipoint," a point of higher complexity singularore. It can be imagined as a space or reference formed by the intersection of levels or planes of several mutually different dimensions. As a qualitative indicator, singulore can reach different levels of density (in terms of the "distance" of the centers of gravity) and thus represent the "strength of the force" of the whole system based on the correlation of the centers of gravity of its subsystems. The sub-dimensions applied in the model enable the relative qualitative homogeneity of the detected or recorded parameter values of the subsystems of the system as a whole (person-situation-task) to describe the current state of the system as a whole and also allow to indicate (propose, model, predict) the "direction" of the development of the system as a whole and its subsystems, or even its "stability" in the sense of tending to constancy, duration (survival and prosperity) or entropy and extinction, or negentropy in terms of qualitative change and transformation. The model can also be used to simulate both the development (e.g. by changing partial parameters) of the entire system in terms of "density," as well as the requirements for changing "direction" in terms of changes in the partial parameters of individual subsystems.

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STUDENT EXPERIENCES OF UNIVERSITY EDUCATION DURING THE COVID-19 PANDEMIC: EVIDENCE FROM SLOVAKIA

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This article is a part of the solution of the project KEGA 029UKF- 4/2022: Preparation of the structure and content of the course, textbook and e-learning course „Entrepreneurial Skills“ for non-economic study programs with a focus on the online environment and project UGA I-09-310-01 Impact of the COVID-19 pandemic on the labor market.

Abstract: The aim of this study was to examine the online education of subjects with an economic focus during the COVID-19 pandemic based on the opinions and experiences of university students in the Slovak Republic. The data were collected using a questionnaire, while the research sample consisted of 358 respondents. Data analysis was performed using the Friedman test, the Nemenyi post-hoc test and the Mann-Whitney test. Students consider safety for health to be the biggest advantage and the biggest disadvantage is the lack of development of interpersonal relationships. The necessary technical equipment to implement online education is not a problem for them. We also found some differences in responses based on gender, degree of study and study results.

Keywords: online education; distance learning; COVID-19; economic subjects; questionnaire

1 Introduction

Online environment and IT technologies have recently become one of the most used terms. The reason behind this is the worldwide Covid-19 pandemic, which was announced by the World Health Organization on March 11, 2020. The pandemic has affected all areas of daily life around the world. Physical distancing rules, government-mandated masks, and shut-downs, as well as partial and total lockdowns, were taking place in almost every country. The health sector was affected, as well as trade, the economy, the environment (Meccawy et al., 2021). One of the strategies to reduce the spread of the virus was the closure of educational institutions (Murphy, 2020). UNO (2020, August) report shows that the Covid - 19 pandemic has created the largest disruption of education systems in history, affecting nearly 1.6 billion learners in more than 190 countries and all continents (Paudel, 2021).

As a result of government measures against the spread of Covid-19, all schools in Slovakia switched to distance education from March 13, 2020. Therefore, teaching did not stop, but continued in most schools despite certain problems thanks to the online environment and IT technologies. Schools had to switch to the distance form of education basically overnight, and this transition was not easy for the schools. Teachers and students alike had no choice in this matter, and many changes, were necessary to survive the pandemic period without halting the educational process completely (Meccawy et al., 2021). Online learning systems instead of traditional face-to-face classes were adapted in a short period of time and this might have brought further challenges for the students (Ogel-Balaban, 2022). Online education systems require the integration of technology into education by institutions, their teachers and students, and this integration has not necessarily been mastered by all students or teachers (Ali, 2020). The lack of resources for this integration might interfere with the effectiveness of online education (Ogel-Balaban, 2022). The educational process in Slovakia was organized in online format using various educational technologies and programs (Zoom, Google Classroom, Microsoft Teams, Jitsi Meet, Skype, ...), which ensured the transfer of information and communication with students using the internet. One of the priority goals was to ensure the quality of education when operating through the remote format (Belikova, Shkil, 2021). These tools provide integrated functions like communication, interaction and storage (Senel, Senel, 2021).

2 Literature review

One of the primary needs of humans today is education. Various models are used to support the learning process, one of which is online learning (Nugroho, 2021). There are many terms for online education. Some of them are: virtual education, Internet-based education, web-based education, and education via computer-mediated communication (Hudáková, Papcunová, 2019). Online learning encompasses the use of the internet, intranet, or extranet along with animations, simulations, audio, video sequences, discussion groups, online mentoring, online feedback, online sharing of learning and resource materials (Iqbal et al., 2022). The application of new technologies together with their effective potential changed the approach to education. It is safe to say that innovations in education have the potential to be a driver of future opportunities (Urbaníková et al., 2020). The goal is for students to become full-fledged and competitive members of our society (Brecka et al., 2022). Online education is not a new phenomenon in the international educational landscape and has long been explored around the world in various forms and magnitudes. Over the years, the use of online and distance education has grown exponentially and become very popular (Dumford, Miller, 2018). It has been argued that online education has made its mark and would persist as a relevant way of education in the future due to the various benefits it offers (Ternus et al., 2007). However, online or distance education in the current scenario, where it might be referred to as 'emergency online education', is relatively new and one whose implications are constantly unwrapping in front of the international community (Marinoni et al., 2020).

During the pandemic, the COVID-19 disease distancing measures forced a sudden transition to online education at most universities and put enormous pressure on students to creatively adapt to new ways of online education (Shirish et al., 2021). Online education has brought several advantages during the pandemic. According to studies by several authors (Manea et al., 2021; Toufaily et al., 2018; Alexander et al., 2012; Muthuprasad et al., 2021; Iqbal et al., 2022), students mainly consider greater flexibility and convenience in education, cost efficiency and time saving as advantages of online education. Students considered online education beneficial for them since it allowed them to take additional job opportunities or continue existing ones. It can provide a more open learning environment and richer learning resources (Zhao, 2022). E-learning technology gives the student control over content, pace, and the ability to tailor material to their interest (Mortagy et al., 2022).

Distance learning is considered as an effective medium for teaching and learning (Hereward et al., 2020; Joosten et al., 2020; Toney et al., 2021). However, during the covid-19 pandemic, the authors (Robinson, 2020; Senel, Senel, 2021; Di Pietro et al., 2020; Hussein et al., 2020; Fosslien, Duffy, 2020; Machado et al., 2020; Upadhyaya, Vrinda, 2021; Muthuprasad et al., 2021; Hvalshagen et al., 2021; Watermeyer et al., 2021; Mortagy et al., 2022) discovered that distance education brings several problems, such as loss of interest in learning, emotional stress, loss of productivity, problems with mental and physical health, lack of quality teaching materials, failure to cope with increased IT demands, technical problems (insufficient technical infrastructure such as software, hardware and Internet connection, problems with connection speed, disconnections, or other technical problems) and alike. The teaching staff might not be ready to use the technological devices and online platforms. Even if they are ready, the curriculum might not be easily adapted to the online platforms and the practical requirements of the course cannot be implemented (Ogel-Balaban, 2022). Moreover, although students might be regular users of technological devices, they may not have enough knowledge and technology skills to use online platforms (Ali, 2020). For the stated reasons, as the authors state Mehta et al. (2021) and Ogel-Balaban (2022), relying on a digital educational environment is

not always successful and can create a negative attitude towards online education. The current COVID-19 pandemic has thereby raised the issue of the effectiveness of online education.

According to author Paudel (2021) the success of online education and change in educational management system depend upon teachers' dedication, motivation, time, support and technological knowledge and skills. Considering both the possible positive and negative effects of online education on students, it can be claimed that how the students' perceive online education might be an important factor related to their psychological well-being (Ogel-Balaban, 2022). Certain factors such as flexibility, convenience, and motivation to use technology can contribute positively while factors such as internet and connectivity issues, lack of concentration and isolation may affect the students' experiences negatively (Iqbal et al., 2022).

The aim of this study is to examine the online education of subjects with an economic focus during the COVID-19 pandemic based on the opinions and experiences of university students in the Slovak Republic. We tried to find answers to the following research questions:

RQ1: How important are the advantages and disadvantages of online education to students?

RQ2: Are there significant differences between individual factors (positive or negative)?

RQ3: What was the level of online teaching compared to face-to-face education based on the selected criteria?

RQ4: Are there significant differences in opinion in terms of gender, level of study and study results?

3 Research methodology

To achieve the goal, we created a questionnaire that focused on various aspects of online education. Using this tool, we obtained primary data for our research. First, we implemented a pilot testing of the questionnaire in the form of an interview with a sample of 14 respondents, in order to find out whether all the questions are formulated clearly and comprehensibly. Based on the feedback, we then made small adjustments and the answers of the respondents from the pilot testing were not included in the research results. We then distributed the final version of the questionnaire to a specific group of students who completed education in at least one economically oriented subject (for example, the basics of economics, macroeconomics, financial literacy, etc.) at the Constantine the Philosopher University in Nitra. A total of 595 students were approached, while 358 respondents, who make up our research sample, filled out the questionnaire. A relatively high return of 60% was achieved by informing students in advance and asking them to participate in the research. The questionnaire was anonymous, so everyone could express their opinions without fear. Data collection took place from January to March 2022, so each participant completed at least one semester of online education, including first-year students.

We used both descriptive statistics (percentages, arithmetic mean, standard deviation, etc.) and inferential statistics to process and evaluate the answers. In order to be able to statistically evaluate the individual answers, it was first necessary to create a data matrix. This means that, for example, we replaced the range of answers that had an ordinal character (the answers could be arranged in order) with numbers. When using inferential statistics, we considered whether to use parametric tests or their non-parametric alternatives. Although we have collected a large enough sample so that we do not have to investigate the normality of the data distribution, and based on the central limit theorem, it would be possible to use parametric tests. However, since our data matrix contains ordinal data, we preferred to use non-parametric tests for analysis. We used the Friedman test to compare multiple dependent samples. The

subsequent examination of the two experimental units was carried out using the Nemenyi post-hoc test. We used the Mann-Whitney test for two independent samples to determine differences in responses based on selected variables. All tests were performed at a significance level of 0.05. This means that a p-value lower than 0.05 was considered to be the defined limit for assessing statistical significance. The data analysis for this paper was generated using the Real Statistics Resource Pack software (Release 7.6). Copyright (2013 – 2021) Charles Zaiontz (Zaiontz, 2020).

4 Results

Table 1 summarizes the personal characteristics of the research participants. 278 (77.65%) females and 80 (22.35%) males participated.

Table 1. Personal characteristics of the participants (total number 358).

Variable	Number of respondents	Percentage
Gender		
Female	278	77.65
Male	80	22.35
Total	358	100.00
Degree of study		
Bachelor	238	66.48
Master	120	33.52
Total	358	100.00
Study results		
Value A-B	202	56.42
Value C-E	156	43.58
Total	358	100.00

The higher representation of females in the sample is due to the fact that, overall, more females than males completed education with an economic focus. When we look at the sample from the point of view of the level of study, we see 238 (66.48%) students with a bachelor's degree and 120 (33.52%) students with a master's degree. Again, this is due to the fact that the total number of students in the bachelor's degree is higher, since the bachelor's degree includes 3 years and the master's degree only two.

The last characteristic that interested us was study results. We divided the respondents into two groups. The first group with better academic results was made up of students with A or B grades prevailing during their studies. The second group with worse academic results had predominant grades C to E.

4.1 Students' opinions on online education

Table 2 shows the answers of students regarding the advantages of online education. We were interested in the importance they attach to individual items. The overall average of all items was 1.953, which, given the chosen range of answers, indicates that the benefits of online education are important for students. Table 2 shows the arithmetic means for each item separately, standard deviations and interval estimates of the arithmetic mean over the 95% confidence interval.

Table 2. Advantages of online education.

Advantage	Average	St. dev.	-95.00%	+95.00%
A. No need to travel	1.821	1.118	1.705	1.937
B. Lower study costs	2.106	1.095	1.993	2.220
C. Safer for health	1.547	0.864	1.458	1.637
D. Less stressful	2.335	1.218	2.209	2.461

Scale: 1 = very important, 2 = important, 3 = average, 4 = not important, 5 = completely unimportant

Based on descriptive statistics, the most important criterion is health. This is the expected result at the time of the pandemic, although in the case of students, we could also expect a preference for education without the need to travel and lower costs of study. However, these two advantages were only in second and third place. The least important advantage is less stress for students. Since the given order was determined on the basis of the arithmetic mean of the answers, it applies to the research sample. If we want to generalize these claims, we need to see if the differences in responses are statistically significant.

Since all questions were answered by the same respondents, these are dependent samples. Therefore, we used the Friedman test. We tested the null hypothesis:

Hypothesis (H0): The average level of all types of benefits of online education is the same, compared to the alternative hypothesis:

Hypothesis (H1): At least for the two types of benefits of online education, the average level of evaluation differs significantly.

We performed the Friedman test with statistical software and calculated p-value = 0.000 with rounding to 3 decimal places. We reject the null hypothesis and accept the alternative hypothesis. We have divided the advantages of online education into four blocks (experimental units), and the question remains unanswered, which advantages are significantly different from each other. To get the answer, we need to perform a post-hoc analysis. For this purpose, we chose the Nemenyi test, which is shown in Table 3.

Table 3. Nemenyi post-hoc test for the advantages of online education.

Advantages		R sum	q-stat	p-value
Advantage A	Advantage B	126	5.158	0.002
Advantage A	Advantage C	105	4.299	0.013
Advantage A	Advantage D	207	8.474	0.000
Advantage B	Advantage C	231	9.457	0.000
Advantage B	Advantage D	81	3.316	0.088
Advantage C	Advantage D	312	12.770	0.000

Based on the test results, we can see that there is not only one significant difference between lower study costs and less stress. All other blocks are significantly different. Based on these results, we can say, for example, that health protection is the most important advantage for students in online education.

Table 4. Disadvantages of online education.

Disadvantage	Average	St. dev.	-95.00%	+95.00%
A. Technology (computer, microph., etc.)	3.933	1.083	3.821	4.045
B. Technical problems (e.g. connection)	3.257	1.217	3.131	3.383
C. Lack of personal contact	2.980	1.479	2.827	3.134
D. Less student activity	3.609	1.276	3.477	3.741
E. Disturbing environment (e.g. family)	3.701	1.361	3.560	3.842
F. Spending a lot of time at the computer	3.067	1.536	2.908	3.226
G. Interpers. relationships do not develop	2.628	1.382	2.485	2.772

Scale: 1 = big problem, 5 = no problem

Table 4 captures the answers regarding the disadvantages of online education, while here, too, all respondents commented on all the blocks of answers offered. The overall average of all items was 3.311, which, considering the chosen range of answers, indicates a slight orientation towards a problem-free opinion. However, the arithmetic mean is quite close to the median.

From the descriptive statistics, we can see that the biggest problem is the lack of development of interpersonal relationships and the smallest problem is technical equipment. Again, we wanted to see if the differences in responses were significantly different. For this purpose, we used the Friedman test and examined similar hypotheses as in the case of the benefits of online education. The calculated p-value = 0.000 means that we reject the null hypothesis and accept the alternative hypothesis. So there are at least two types of disadvantages that are significantly different. To find out which pairs are significantly different, we used Nemenyi's post-hoc test, which is shown in Table 5.

Table 5. Nemenyi post-hoc test for the disadvantages of online education.

Advantages		R sum	q-stat	p-value
Disadvantage A	Disadvantage B	437.5	10.704	0.000
Disadvantage A	Disadvantage C	553	13.529	0.000
Disadvantage A	Disadvantage D	182.5	4.465	0.027
Disadvantage A	Disadvantage E	104	2.544	0.549
Disadvantage A	Disadvantage F	526.5	12.881	0.000
Disadvantage A	Disadvantage G	807.5	19.756	0.000
Disadvantage B	Disadvantage C	115.5	2.826	0.416
Disadvantage B	Disadvantage D	255	6.239	0.000
Disadvantage B	Disadvantage E	333.5	8.159	0.000
Disadvantage B	Disadvantage F	89	2.177	0.721
Disadvantage B	Disadvantage G	370	9.052	0.000
Disadvantage C	Disadvantage D	370.5	9.064	0.000
Disadvantage C	Disadvantage E	449	10.985	0.000
Disadvantage C	Disadvantage F	26.5	0.648	0.999
Disadvantage C	Disadvantage G	254.5	6.226	0.000
Disadvantage D	Disadvantage E	78.5	1.921	0.824
Disadvantage D	Disadvantage F	344	8.416	0.000
Disadvantage D	Disadvantage G	625	15.291	0.000
Disadvantage E	Disadvantage F	422.5	10.337	0.000
Disadvantage E	Disadvantage G	703.5	17.212	0.000
Disadvantage F	Disadvantage G	281	6.875	0.000

Disadvantages of online education were divided into seven blocks (experimental units). Therefore, we had two to 21 options to determine. With the exception of five cases, significant differences were found in all others. Based on these tests, we can say that in terms of disadvantages, the biggest problem is the lack of development of interpersonal relationships. This block is statistically significantly different from all other options. On the contrary, the smallest problem for students is technical equipment. This block is statistically significantly different from all the others with one exception (disturbing environment).

Table 6. Comparison of online education and face-to-face education.

Item	Average	St. dev.	-95.00%	+95.00%
Observance of the duration of teaching	1.852	0.543	1.796	1.908
Student participation	1.765	0.530	1.710	1.820
Study materials in electronic form	1.581	0.592	1.520	1.642
Clarity and comprehensibility of lectures	2.212	0.639	2.146	2.279

Scale: 1 = Better during online, 2 = similar, 3 = Better during face-to-face education

Table 6 shows a comparison of online education and face-to-face education, where, in addition to the average, we also find standard deviations and interval estimates of the arithmetic mean over the 95% confidence interval.

Compliance with the duration of classes has an average slightly shifted from the median in favor of online education. One of the possible explanations lies in the fact that during online classes it was not necessary to waste time with the arrival of students in the lecture room, sitting on the chairs, turning on the data projector and so on. Student participation in teaching also achieved a similar rating. This is the expected result, since students were mostly at home during the pandemic and connecting to online classes was very convenient for them.

We recorded the closest evaluation in favor of online education for teaching materials in electronic form. Students probably consider this to be one of the biggest benefits. Since teaching took place remotely during the pandemic, teachers prepared more materials in electronic form than was the case in the normal period. The only item that has an average shifted from the median towards face-to-face education is clarity and comprehensibility of lectures. This is the result we expected.

4.2 Differences in responses based on selected variables

We analyzed the advantages and disadvantages of online education in more detail from another point of view. We were interested in the differences in respondents' answers based on selected indicators. Table 7 shows the differences based on gender. Since these are independent samples, we used the Mann-Whitney test for two independent samples for analysis. In Table

7, we see a very interesting phenomenon, when in the assessment of benefits, the arithmetic mean for males was higher than for females in all items. This indicates that females attach more importance to the benefits of online education than males. We can also say that the benefits of online education are not as important for men as for women. Apparently, travel or higher expenses for studies do not bother them that much.

Table 7. Differences in responses based on gender using the Mann-Whitney test.

Advantage	Female (N=278)		Male (N=80)		p-value
	Mean	SD	Mean	SD	
No need to travel	1.763	1.062	2.025	1.283	0.070
Lower study costs	2.058	1.060	2.275	1.201	0.096
Safer for health	1.507	0.796	1.688	1.063	0.208
Less stressful	2.270	1.212	2.563	1.221	0.029
Scale: 1 = very important, 2 = important, 3 = average, 4 = not important, 5 = completely unimportant					
Disadvantage	Female (N=278)		Male (N=80)		p-value
	Mean	SD	Mean	SD	
Technology (computer, microphone, etc.)	3.863	1.073	4.175	1.088	0.004
Technical problems (e.g. connection)	3.155	1.169	3.613	1.317	0.000
Lack of personal contact	2.939	1.452	3.125	1.570	0.168
Less student activity	3.583	1.251	3.700	1.363	0.160
Disturbing environment (e.g. family)	3.622	1.372	3.975	1.292	0.017
Spending a lot of time at the computer	2.950	1.531	3.475	1.492	0.004
Interpersonal relationships do not develop	2.622	1.375	2.650	1.415	0.450
Scale: 1 = big problem, 5 = no problem					

In two cases these differences were statistically significant. Conversely, in the case of disadvantages, the arithmetic mean for males was higher than for females in all items. This suggests that disadvantages are more of a problem for females than for males. Most of these differences were statistically significant.

Table 8. Differences in responses based on degree of study using the Mann-Whitney test.

Advantage	Female (N=278)		Male (N=80)		p-value
	Mean	SD	Mean	SD	
No need to travel	1.912	1.149	1.642	1.035	0.011
Lower study costs	2.189	1.122	1.942	1.023	0.025
Safer for health	1.559	0.883	1.525	0.830	0.401
Less stressful	2.340	1.249	2.325	1.161	0.444
Scale: 1 = very important, 2 = important, 3 = average, 4 = not important, 5 = completely unimportant					
Disadvantage	Female (N=278)		Male (N=80)		p-value
	Mean	SD	Mean	SD	
Technology (computer, microphone, etc.)	3.954	1.103	3.892	1.044	0.214
Technical problems (e.g. connection)	3.269	1.210	3.233	1.235	0.368
Lack of personal contact	3.000	1.476	2.942	1.491	0.357
Less student activity	3.517	1.321	3.792	1.166	0.039
Disturbing environment (e.g. family)	3.689	1.407	3.725	1.270	0.471
Spending a lot of time at the computer	3.063	1.543	3.075	1.529	0.464
Interpersonal relationships do not develop	2.647	1.406	2.592	1.338	0.398
Scale: 1 = big problem, 5 = no problem					

Table 8 shows the differences between bachelor's and master's degree students. In the evaluation of benefits, the arithmetic mean for bachelors was higher than for masters in all items. This indicates that master's degree students attach more importance to the benefits of online education than bachelor's degree students. In two cases these differences were statistically significant. Regarding the disadvantages, the opinions of bachelors and masters were very similar, since, with the exception of one item, the differences were not significant.

Table 9 shows the differences in terms of study results. We divided the respondents into two groups. A group with better academic results (A-B) and a group with worse academic results (C-E). When evaluating the benefits, the results were very similar, we did not find any significant differences. In terms of disadvantages, we found differences in two items. Spending too much time at the computer and the lack of development of interpersonal relationships are considered a bigger problem by students with better academic results.

Table 9. Differences in responses based on study results using the Mann-Whitney test.

Advantage	Female (N=278)		Male (N=80)		p-value
	Mean	SD	Mean	SD	
No need to travel	1.792	1.131	1.859	1.104	0.169
Lower study costs	2.104	1.039	2.109	1.167	0.350
Safer for health	1.535	0.853	1.564	0.881	0.397
Less stressful	2.366	1.135	2.295	1.321	0.131
Scale: 1 = very important, 2 = important, 3 = average, 4 = not important, 5 = completely unimportant					
Disadvantage	Female (N=278)		Male (N=80)		p-value
	Mean	SD	Mean	SD	
Technology (computer, microphone, etc.)	3.946	1.071	3.917	1.101	0.430
Technical problems (e.g. connection)	3.188	1.215	3.346	1.216	0.092
Lack of personal contact	2.886	1.473	3.103	1.482	0.087
Less student activity	3.663	1.248	3.538	1.312	0.201
Disturbing environment (e.g. family)	3.614	1.378	3.814	1.333	0.081
Spending a lot of time at the computer	2.936	1.510	3.237	1.558	0.027
Interpersonal relationships do not develop	2.510	1.347	2.782	1.416	0.037
Scale: 1 = big problem, 5 = no problem					

5 Discussion

One of the impacts of Covid-19 on education systems has been the shift to online education, which is new experiences and practices for many of the teachers and students (Paudel, 2021). In our study, we investigated online education during the COVID-19 pandemic based on the opinions and experiences of university students in the Slovak Republic. We chose a very specific field, teaching with an economic focus. We are not aware that a scientific article with research from Slovakia has been published on this topic. Even a general comparison of online education has not been published. Therefore, we will now try to compare our results with studies from other countries. However, they may differ due to specificities, traditions and educational systems in different countries.

Students consider safety for health to be the biggest advantage of online education during the pandemic. Students also consider the fact that they do not have to travel an important factor. In their opinion, the biggest disadvantage is the lack of development of interpersonal relationships. The necessary technical equipment to implement online education is not a problem for them. In several other countries, for example Egypt (Mortagy et al., 2022) or Pakistan (Iqbal et al., 2022), students had more problems with technical equipment and Internet connection.

During the implementation of online education, a large number of electronic teaching materials were created, which would either not have been created in the case of face-to-face education, or would have been created only to a lesser extent. This fact was also taken into account by the students in our questionnaire and it is also confirmed by studies from other countries, for example from Pakistan (Iqbal et al., 2022). However, it puts more demands on teachers because they have more work to do. However, according to other studies, online education also brings more work for students (Meccawy et al., 2021). On the other hand, clarity and comprehensibility of lectures were better during face-to-face education, so in the normal period after the end of the pandemic, we would recommend education in the traditional way. Although, it must be said that online education can be an alternative means of traditional education (Paudel, 2021). Alternatively, the possibility of combined teaching may appear interesting, when the advantages of online education and traditional education could be used (Mortagy et al., 2022).

When examining the differences based on selected variables, we found that females attach more importance to the benefits of online education than males. But at the same time, the disadvantages are a bigger problem for them than for males. We also found differences based on degree of study. Master's degree students consider the benefits of online education more important than bachelor's degree students.

6 Conclusion

The research in our article represents a good basis for further research in the future. It is possible to continue in different directions. For example, it could be interesting to find out the level of distance education in other countries. For a good comparison, other countries in the area could serve, for example, Poland, Hungary, the Czech Republic and others. The subsequent comparison would bring a more comprehensive view of managing online education during the pandemic. Our study focused on the opinions and experiences of students. Teachers are an equally important part of the teaching process. Therefore, it would be interesting to find out teachers' opinions and experiences of online education during the COVID-19 pandemic, which is another possible direction of research in the future. In order to create a comprehensive view of online education, we would like to focus on actual results in addition to opinions. Therefore, in the future, we plan to find out and compare the study results that were achieved before the pandemic and during the COVID-19 pandemic. We could thus compare face-to-face education and online education not only on the basis of opinions and experiences, but also on the basis of results.

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Primary Paper Section: A

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GENDER DIFFERENCES IN BEHAVIOUR PROBLEMS OF CHILDREN IN PRESCHOOL AGE IN SLOVAKIA BASED ON TEACHERS' RATINGS

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Study is the partial outcome of the research project VEGA 1/0684/19 Evaluation of behavioral interventions in education of children with autism spectrum disorders and other developmental disabilities

Abstract: Problem behaviour is increasingly observed in preschool children. Its occurrence can negatively affect not only a child's pre-school education and readiness for further education, or develop into more serious behavioural disorders, but according to several studies, behavioural problems at an early age also affect an individual's educational attainment in adulthood. The proposed study presents the results of a nationwide survey in Slovakia, where, through a self-constructed questionnaire, pedagogical and professional staff of kindergartens in Slovakia (n=450) reflected on incidence, prevalence, symptoms, and gender differences in behaviour problems manifested among children of preschool age in the Slovak kindergartens.

Keywords: preschool age, behaviour problems, gender differences, teachers' ratings.

1 Theoretical perspective of behaviour problems in preschool children

The preschool period includes ages three to less than six years old. This is a period of significant growth and development as children's maturing physical, cognitive, and social skills give way to an increasing understanding of themselves and the world around them. Yet, this stage of development is also characterized by behavioural problems, as parents and teachers across cultures typically report relatively high rates of it (Campbell et al., 2000). Preschool age is characterized by a rapid development in all aspects of development. During this development, the presence of emotional and behavioural problems can happen to any child, although it must be said that it is not always easy to define the emotional or behavioural problems. But, at the same time, it is indisputable fact that due to the importance for the overall development of children, the study of psychopathological problems of preschool children has increased significantly both in terms of research and in terms of clinical treatment (Carter, 2010).

One of the most important objectives of preschool period is to prepare children for school. The transition from preschool to first grade requires children to adjust their behaviour according to the new environment and to negotiate new social relationships. The establishment of relationships with new teachers appears particularly important, as their quality forecasts children's subsequent academic and social development (Sabol et Pianta, 2012). Indeed, negative teacher-child relationships involving high levels of conflict predict limited school engagement, poor academic achievement, and problem behaviour (Doumen et al., 2008; Sabol et Pianta, 2012). Recognising that the early years of growth are critical in charting a child's later developmental trajectories, researchers have devoted heightened efforts to understand factors affecting child outcomes. For some preschoolers, we may encounter problem behaviours that go beyond their adaptation process in preschool. These can be problems such as tantrums, noncompliance, overactivity, destructive behaviour, property destruction, self-stimulatory behaviour, and according to Campbell (2006) difficulties in behaviour can be an indicator of emerging behaviour problems or an age-appropriate, short-lived manifestation of stress.

Behaviours characterized as problematic in the preschool years are typical during toddlerhood and decrease after age 3. For example, while some aggression can be expected among very young children, high and escalating rates of aggression in preschool children are atypical (Wakschlag et al., 2010). Similarly, noncompliant behaviour generally increases before preschool as an expression of increasing independence and decreases as preschoolers become adept at using alternate methods of negotiating for their desired goals. Atypical

noncompliance is accompanied with negative affect, is often resistant to redirection, and is intransigent (Wakschlag, et al., 2010). The emergence of problem behaviour can be influenced by a number of factors that need to be taken into account when developing a course of action to address it in order to prevent behavioural problems persisting later in life. Behaviour problems, such as severe temper tantrums, aggression, and pervasive noncompliance, affect an estimated 9% to 15% of preschool-aged children (Egger et Angold, 2006). There is almost an agreement among researchers on a classification of behaviour problems: in internalizing behaviour problems, defined as an overcontrol of emotion, which are expressed in intrapersonal manifestation, such as anxiety, depression, and withdrawal and externalizing problems, defined as an undercontrol of emotions, which are demonstrated in interpersonal manifestation, such as hyperactivity and aggression (Achenbach & Rescorla, 2000). Behaviour problems have often been conceptualised along two broad spectrums: (1) internalising problems which are expressed in intrapersonal manifestation, such as anxiety, depression, and withdrawal; and (2) externalising problems which are demonstrated in interpersonal manifestation, such as hyperactivity and aggression (Achenbach et Rescorla, 2000; Dearing et al., 2006).

It is not difficult to imagine that maladaptive behaviour is disruptive to and interferes with socially acceptable norms of conduct in one's life. While certain behaviour issues might seem typical of the early stage of development and many children who manifest behaviour problems in early childhood seem to outgrow them, many other children continue to battle with behavioural difficulties across multiple developmental periods. Maladaptive behaviour in early childhood can interfere with a child's later school performance. Previous research has documented that externalising behaviour problems in childhood linger into the elementary school years and beyond (Campbell et al., 2000; Miller-Lewis et al., 2006), and become even more severe in adolescence and adulthood (Bennett et Lipman, 1999; Loeber, 1991). Other evidence has further substantiated that children's early emergent problem behaviours can have long-lasting, negative repercussions that disrupt the other areas of their development, particularly psychological adjustment, and academic competence (Stacks, 2005).

1.1 Gender differences in behaviour problems of preschool children

In the broader literature, gender is differentially related to mental health outcomes (Johnson et Whisman 2013; Tsorbatzoudis et al. 2013). Biological differences between males and females (e.g., hormones) are sometimes cited as an explanation for these differences (Matsuzaka et al. 2013). However, gender socialization also plays a significant role. For example, males are reinforced for aggressive behaviour (Kingsbury et Coplan 2012), making them more likely to develop externalizing problems. Females are reinforced for prioritizing the needs of others (Cox et al. 2010), which may put them at greater risk of developing internalizing problems. A recent meta-analysis of children (ranging from infancy to adolescence) demonstrated that girls are more likely to exhibit internalizing, while boys are more likely to exhibit externalizing symptoms (Chaplin et Aldao 2013).

Behavioural problems develop in the interplay between nature and nurture, with clear gender differences. According to Ermisch (2008) and Bertrand et Pan (2013), girls tend to have much fewer externalizing behavioural problems at school age than their male peers but are more likely to have internalizing problems. A survey carried out by Heckman (2008) shows that gender differences in, for instance, child rearing inputs may affect the way behavioural skills are acquired. A large stream of research stresses the biological or genetic (nature) reasons for behavioural problems and claims that, for example, the

development of female brains is different from male brains and that this may have consequences at an early age for the observed gender gap in behaviour.

Research has revealed gender differences in behaviour problems, especially in externalising behaviour. For instance, it has been reported that boys tend to demonstrate a significantly higher propensity to manifest externalising problems than girls (Prior et al., 1993). Particularly at school entry, boys experience as much as 10 times higher rates in externalising problems than girls, while the rates of internalising problems are similar for both genders, and these gender-related behaviour patterns tend to persist throughout childhood. The significant differences in developmental trajectories between boys and girls suggest the need to consider the child's gender as a critical characteristic accounting for the variations in externalising behavioural outcomes among children (Keane et Calkins, 2004). Gender differences in hyperactivity and conduct/peer problems were pronounced in teachers' ratings, but only moderate according to parents (Collishaw et al., 2009). Agreement between informants is, at best, moderate (De Los Reyes et al., 2009). The reasons for disagreement include reporter bias and measurement error (Collishaw et al., 2009). Questionnaire ratings can mask the contextual causes of gender differences in behaviour. In particular, because children's peer interactions are gender-segregated from an early age, boys' and girls' may differ in aggressiveness because of the particularly high rates of provocation amongst boys. Empirical support for this 'two cultures' model comes from a meta-analytic review that demonstrated that girls and boys behaved similarly when engaged in similar activities (Leaper et Smith, 2004).

The solutions for the abovementioned problem behaviours are also possible by improving the strategies of the preschool teachers for competing with the unfavourable situations and if the preschool teachers adopt the steps in the body of effective discipline approaches. Otherwise, it is inevitable that preschool education services delivered in a somehow unorganized manner through persons, institutions, or environment trigger challenging behaviours of the children. Accordingly, the process of preventing problem behaviours is not independent from the process of practicing effective strategies and positive discipline approaches (Aygün et al., 2014; Ellis, 2018).

2 Methods

According to various research findings there are gender differences on social skills, problem behaviour, academic skills (Abdi, 2010, Owens, 2016), behavioural compliance (Granić, 2007), seeking social support, problem solving, avoidant coping emotion expression (Chaplin et Aldao, 2013), artistic production and preference of preschoolers. Abdi (2010) investigated gender differences on social skills, problem behaviour and academic competences of kindergarten children. Results of his research with 610 parents and 228 teachers on 292 girls and 318 boys showed that even girls scored higher than boys on social skills, boys scored higher than girls on the externalizing and hyperactivity problem behaviour with no gender differences on internalizing. Kung et al. (2018) investigated the association between gender-typed play behaviour in early childhood and physical aggression in early adolescence. Masculine children exhibited significantly more physical aggression than control children or feminine children, and control children exhibited significantly more physical aggression than feminine children. However, results suggest that the degree of childhood gender-typed play behaviour independently predicts the degree of physical aggression at adolescence in boys and in girls.

Agreeing with Owens (2016) early behaviour problems predict outcomes more for boys than for girls. Which supports the need to address gender differences also in specific approaches in dealing with problem behaviours in preschool children already. Effective support to address problem behaviour needs to be targeted to the type and manifestation of problem behaviour, its causes, or environmental factors.

The research problem stated above has led to the formulation of following survey questions:

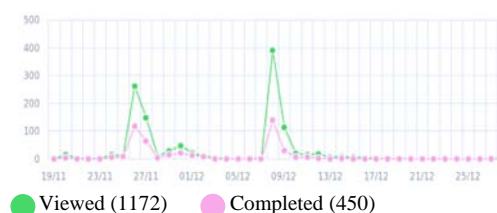
1. Is there any difference in behaviour problems prevalence between girls and boys in their preschool age?
2. What is the perception of behaviour problems in preschool children from the educational staff?
3. Is there any relationship between the seniority of the participants, education level of the participants, work position of the participants, and their view on behaviour problems in girls and boys of preschool age?

2.1 Materials and data collection

The survey idea and emergency raised from the project *VEGA 1/0684/19 Evaluation of behavioural interventions in education of children with autism spectrum disorders and other developmental disabilities*. One of the project partial goals was to examine current prevalence of behaviour problems in preschool children in Slovakia. For this intention we have created a questionnaire, which consisted of 31 items focused on basic demographic information such gender, education background, seniority, etc., but the main attention was given to the phenomenon of behaviour problems in preschoolers – its perception by teachers, cooperation with a family, with other institutions, education and information about the issue provided by the employer.

The online version of the questionnaire was created on the Survio® web page. Invitation with URL link was sent via e-mail to available e-mail addresses of all kindergartens in Slovakia. Moreover, we have used social media to advert this survey. The survey was available 26 days (20th November 2020 – 15th December 2020). The survey had 1172 visits, 722 full views, but of these it had 450 completions, which represents 38,4% successful return. The direct link on the social media was used by 44,4% of participants, 55,6% of participants reflected on the e-mail invitation to the survey completion. On the picture 1 is demonstrated the history of the survey's link visits. Obviously, the most reactions were after sending the e-mail invitations, respectively after the publication of the survey link on the social media.

Picture 1 History of survey's visits



2.2 Participants

The sample consisted of 450 (449 female and 1 male) kindergarten professionals from various Slovak regions (table 1). Most of the participants were preschool teachers (241) or principles of the kindergarten (188). The remaining participants were special education teachers (14) or paraprofessional (1). In terms of age, the largest group of participants was those aged 41 and over, accounting for 62.9% (283). This was followed by respondents aged between 31 and 40 years, at 21.9% (103). The smallest group was made up of respondents aged between 18 and 30 years, with 14.2% (64). The largest group of participants consisted of those with a length of practice of over 16 years. As many as 40.4% (182) of respondents had a master university degree and 18.9 % (85) of respondents had a bachelor's degree.

Table 1 Distribution of participation in terms of Slovak regions

REGION	N	%
Banská Bystrica	56	12,4%
Bratislava	54	12,0%
Košice	64	14,2%

Nitra	44	9,8%
Prešov	85	18,9%
Trenčín	56	12,4%
Trnava	46	10,2%
Žilina	45	10,0%

The distribution of participants in terms of regions was relatively equal. However, the Prešov region was represented most significantly. This may be due to the affiliation of the authors of the study, but also to the fact that this region is the most populated and has the largest number of kindergartens in Slovakia.

Table 2 Age distribution of children with whom the participants work

CHILDREN'S AGE	N	%
2,5 - 4 years	103	22,9%
4 - 5 years	69	15,3%
5 - 6 years	158	35,1%
3 - 6 years	115	25,6%
Children with postponed compulsory school attendance	5	1,1%

As many as 158 participants, representing 35.1%, work with children aged 5-6 years. Achenbach (2004) reports that problem behaviour is most pronounced in this period.

3 Results

Following tables represent survey findings where the correlations between a child's with problem behaviour and a teacher's seniority, education, age, and work position are demonstrated. The most significant survey findings are discussed more detailly in the section below.

Table 3 Opinions about the occurrence of problem behaviour in some of the children in their school class

OCCURENCE	N	%
yes	405	90,0%
no	45	10,0%

The table 3 shows that the 90% of participants (n=405) thinks that there is at least one child with problem behaviour in their classroom. This might be considered as alarming number. For instance, there was an international comparison of behaviour problems prevalence among preschool children where there were 24 countries included and the average prevalence was approx. 24% (Rescorla et al., 2011).

Table 4 Views on the prevalence of problem behaviour in terms of gender

GENDER	N	%
Boys	335	74,4%
Girls	11	2,4%
Both	104	23,1%

Boys are considered to have more likely problem behaviour than girls by their teachers in 335 participants (74,4%), 104 (23,1%) of participants say that the problem behaviour is present in both genders equally. As mentioned previously, boys tend to demonstrate a significantly higher propensity to manifest externalising problems than girls (e.g. Prior et al., 1993).

Table 5 Teacher's age correlated with a child's with behaviour problems gender

Child's gender/Teacher's age	Boys	Girls	Both	Total
18 – 30 years	50	2	12	64
31 – 40 years	73	2	28	103
41 – more years	212	7	64	283
Total	335	11	104	450

Out of 283 participants who were older than 41 years, as many as 212 claim that boys are having problem behaviour more often.

Table 6 Teacher's education correlated with a child's with behaviour problems gender

Child's gender/Teacher's education	Boys	Girls	Both	Total
University – 1 st level	62	1	22	85
University – 2 nd level	140	3	39	182
University – 3 rd level	5	0	2	7
High school – general focus	18	0	7	25
High school – focus on preschool education	110	7	34	151
Total	335	11	104	450

The master's degree held 182 participants, while 140 of them have agreed also that the problem behaviour is occurred more in boys.

Table 7 Teacher's work position correlated with a child's with behaviour problems gender

Child's gender/Teacher's position	Boys	Girls	Both	Total
Principal	137	5	46	188
Teacher	180	6	55	241
Special education teacher	11	0	3	14
Teacher's aid	7	0	0	7
Total	335	11	104	450

Regardless of the work position of the participants, most of them, 335 (74,4%) consider male gender as more problematic when it comes to their behaviours. Only 11 (2,4%) of them think that girls are having problem behaviour more often than boys.

Table 8 Length of a teacher's practice correlated with a child's with behaviour problems gender

Child's gender/Teacher's practice	Boys	Girls	Both	Total
0 – 5 years	72	2	17	91
6 – 10 years	42	1	15	58
11 – 15 years	34	0	11	45
16 – more years	187	8	61	256
Total	335	11	104	450

The study of Sezer (2012) is in the accordance with our findings which says that the more experienced teacher the more sensitive to possible abnormalities in the behaviour of his/her children he/she is. In our survey as many as 187 (73,1%) of 256 participants with their seniority more than 15 years perceive boys as more problematic when it comes to their behaviour.

4 Discussion

The relationships between preschool children and their teachers are an important component of the quality of the preschool experience. Teacher-child relationships take on a particular importance in the preschool settings. Preschool teachers are often the first significant non-family adult with whom the child forms an ongoing relationship. Preschool teachers play the role of both caregiver and educator. They are providing the child with his or her first group learning experience and setting the stage for the child's future success or failure in the school setting.

Problem behaviours in early childhood predict later problems in children's relationships with teachers and with peers. Evidence suggests that preschool teachers feel underprepared to handle children with challenging behaviour (Hemmeter et al., 2008). In

addition, there are indications of higher rates of expulsion at the preschool level than in K–12 education (Gilliam, 2005). In preschool settings, children with behavioural problems are likely to be served in classrooms with teachers with insufficient training and resources to address their needs using positive strategies, leading to harsher responses and increased exclusions (Scott et al., 2005).

Although the experienced teachers perceive students' problematic behaviours as less problematic than novice teachers, problem behaviours are one of the factors effecting both experienced and novice teachers' burnout levels (Sezer 2012). The fact that teachers have stated that they spend more time to overcome the problem behaviours displayed by the students in their classes than the time to teach such students (Little, 2005) is an indication that the problem behaviours of the students may result in burnout among such teachers.

Regarding behavioural expectations, few studies address the relationship between teacher perceptions of children and teachers' behaviours toward those children (Van Acker et Grant, 1996). The results of these studies suggest that teachers treat children more negatively when teachers perceive those children as having problem behaviours. The problem behaviours in these studies included aggression, hyperactivity, and lack of participation. The negative treatment by the teachers included giving more reprimands and commands, displaying more negative affect, and avoiding social interaction with the children.

Teacher-child relationships take on particular importance in preschool settings. Preschool teachers are often the first significant non-family adult with whom the child forms an ongoing relationship. Preschool teachers play the role of both caregiver and educator, providing the child with his or her first group learning experience and setting the stage for the child's future success or failure in the school setting. Despite the importance of this developmental period, the only extant research investigating the relationship between teachers' perceptions of preschool-aged children and teachers' behaviour toward those children were conducted by Dobbs et al. (2004) and Hagekull et Hammarberg (2004).

In studies in which the same rating instrument is used by parents and teachers the child is often perceived as having less severe problems by their teacher (Winsler et Wallace, 2002). Teachers' ratings of behaviour problems have been found to differ from ratings by parents and independent observers, especially concerning aggressive behaviours (Harden et al., 2000). However, on problems related to peer relations and problems interfering with academic functioning, teachers rated problems higher than parents. When children, aged 3-6 years, were observed in playgroups, the teachers' ratings of externalising behaviours corresponded better to observations than parents' ratings. On the other hand, parents' ratings were better predictors of the observed internalising behaviours of children. The agreement between teacher and parent ratings of problems is often modest. In a meta-analysis Achenbach et al. (1987) found a mean correlation of .32 for externalising problems and .21 for internalising problems. Teacher – parent agreement scores within the same range were found by Winsler et Wallace (2002). The mean correlations between teachers who saw the child in the same setting were consistently higher: .74 for externalising problems and .61 for internalising problems (Achenbach et al., 1987). It could be noted here that teachers' ratings of problem behaviours are a somewhat better predictor of later signs of disturbance than parents' ratings. Thus, it is important to include teachers' ratings of problems in research that concerns child development over time.

5 Conclusion

It is accepted that it is required to address the problem behaviours starting from the preschool period, and the need for making a realistic evaluation on the challenging behaviours comes to existence, as well. In fact, it is possible that preschool children exhibit incorrect or limited behaviours due to the

inadequacies in their balance coordination, limitations in their cognitive capacities, and deficiencies in their social skills. Addressing these behaviours directly as challenging behaviours causes an unrealistic evaluation on the children. Problem behaviours may originate from the uncertainties in the rules, inadequacies in the educational environment, and disruptions in the classroom management. Therefore, unfavourable behaviours, which continue their existence intensively even when the abovementioned conditions are improved and the impacts of the unfavourable stimulus at the background are minimized, might be an indicator of an inadequacy (Ellis, 2018).

Undergraduate teacher training focused more on specific behaviour problems in preschool children, provide knowledge from literature and workshops, as well as open and productive communication between the school and family might be one of the possible solutions. It is required to ensure that the strategies of teachers for competing with problem behaviours are positively improved and ensure them to adopt effective discipline approaches. In this process, the knowledge, skills, and experiences of preschool teachers in the dimension of classroom management should be improved.

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Primary Paper Section: A

Secondary Paper Section: AM, AN

THE IMPACT OF THE PANDEMIC ON TECHNICAL EDUCATION: A COMPARATIVE STUDY

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Abstract: The period of the pandemic was clearly stressful for almost all areas of daily life. While the area of the school education system, primary, secondary and higher education, is in the media's crosshairs almost every day, the extensive area of further education has mostly gone unnoticed. The fact is that we found ourselves in a new, specific situation that we were not prepared for. As far as it was possible, school education switched to another form (e-learning, distance learning, etc.), but this option was not always possible for material reasons. The introduction of online teaching was not only for schools and teachers, but also for students. There was a need for contact between teachers and students, access to information and additionally flexible professional support for the teacher. The aim of the contribution is to supplement the comparison of the individual waves of the pandemic from the point of view of education at the Department of Technology and Information Technologies, Faculty of Pedagogy of the Constantine the Philosopher University in Nitra.

Keywords: education, pandemic, technology, e-learning

Introduction

2020 was clearly a stressful year for almost all areas of daily life, not excluding education. While the area of the full-time school education system, primary, secondary, and higher education, is in the media spotlight almost daily, the vast area of continuing education has remained largely unnoticed. The fact is that we found ourselves in a new, specific situation that we were not prepared for. The measures to combat the pandemic, consisting of the restriction of mobility, which went hand in hand with the restriction of face-to-face actions, significantly limited educational activity in this area and in most cases made it completely impossible. As far as it was possible, school education switched to another form (e-learning, distance learning, etc.), but this option was not always possible for material reasons. The introduction of online teaching was a challenge not only for schools and teachers, but also for students. It was necessary to ensure contact between teachers and students, access to information and provide professional support to teachers flexibly. Despite the fact that no computer screen can replace personal contact with a teacher, digital education during the pandemic made it possible to move to other new forms of education, making extensive use of information and communication technologies, which also contributed to the acceleration of the digital transformation of education. It can be stated that there are several distance learning platforms that are available to the general population. Two platforms that were strictly binding for the Constantine the Philosopher University in Nitra. The first platform was the EDU Educational Portal and the video conference system Meet.UKF. A big problem was the lack of technical equipment. For this reason, individual teachers were looking for ways to be in contact with students and provide them with at least basic support.

According to Marina Stock McIsaac, distance education is education in which the student and teacher are separated by time and place. It is currently the fastest growing form at the international level. What was once considered a special form of education using non-traditional systems is now becoming an important concept in mainstream education. In the traditional teaching model, teachers and students meet in the same place and at the same time. During the pandemic, however, the participants could not be in one place, so the possibility of a different place at the same time or a different place at a different time was used. Teaching in which participants meet at the same time, typically using communication services, on a common platform from different places, is also referred to as synchronous. This is, for example, a lecture that the teacher presents in real time with the online participation of students. However, the teacher can also choose another way and can pre-record his lecture and provide this recording to the students. Then we talk about asynchronous distance learning. The

situation marked by the Covid-19 pandemic caught the Ministry of Education of the Slovak Republic, and although online education platforms were not provided in the first months of distance education, digital technologies were primarily used for the purpose of communication and mediation of curriculum content between teaching staff, pupils and students at their place of residence. The time frame of the teaching units was flexible, parallel teaching took place according to needs and possibilities in the morning and afternoon hours, which caused increased demands on personnel, technical, communication and time management and on the adaptation of individuals.

The aim of this paper is to examine distance education in the context of the pandemic, technologies, concepts and benefits as it becomes an essential part of education systems in both developed and developing countries. Thanks to new technologies, the ways of teaching and acquiring new knowledge are no longer limited by space and time. New technologies offer great flexibility in when, where and how to distribute teaching and learning and offer flexible learning opportunities for individuals and groups of learners. Distance learning is one of the fastest growing areas of education and its potential impact on all education delivery systems has been greatly enhanced through the development of Internet-based information technology. To meet the needs of a changing world, future distance learning must be time-flexible, without geographical barriers, competitive and student-centered.

1 Research sample and research methodology

The research was carried out in the academic years 2019/2020 summer semester until the academic year 2021/2022 winter semester. In total, there are four semesters, which also represent four waves of the coronavirus. The entire research took place at the University of Konstantin Filozof in Nitra (UKF in Nitra), specifically at the Department of Technology and Information Technologies.

The study was prepared on the basis of the findings that emerged from four questionnaire surveys. All questionnaires were identical and contained 29 questions. The questionnaire initially focused on the precise categorization of respondents according to gender, year, type of study, faculty and department. The next part of the questionnaire focused on education during the corona crisis. This section contains 9 questions and is key to our comparative study. The next section of the questionnaire dealt with technical equipment and experiences with online education. This section also contained 9 questions. The last section focused on the environment in which teaching took place and its microclimatic conditions. There were 5 questions in this section.

The last two sections are not analyzed in this post and will be covered in future posts. All questionnaires were processed using the same statistical methods and then their results were compared and evaluated in a percentage display. In addition to the questionnaire, we also used the literary method, the method of observation and interview to verify our goals. 116 university students (hereafter only respondents) took part in the research over the course of four semesters. Of the total sample of 116 respondents, 59% were men (69) and 41% were women (47).

We were also interested in what form the respondents study. From the answers of the respondents in the questionnaire, it follows that the majority of the respondents, up to 78%, studied in the daily form of study. Only 22% of the respondents who filled out the questionnaire studied in an external form of study.

We also investigated the representation of students in individual grades. According to the graph below, all study years, including doctoral studies and extension studies, were involved in the research. The majority of respondents were from the first year of bachelor's studies (34), followed by respondents from the second year of bachelor's studies (21), first year of master's studies (14), then followed by students of extension studies (10), third year of

bachelor's studies (8 %) and students of the fourth year of bachelor's studies (8%). There were only (5%) respondents from the second year of master's studies. The respondents with doctoral studies had the smallest representation (1%).

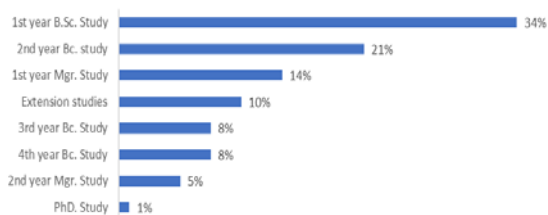


Figure 1 Year of study

Based on the previous findings, we can state that in the research, all grades that are educated at the Department of Technology and Information Technologies of the UKF in Nitra are represented. Due to the focus of the department, the respondents are mostly men. The ratio of full-time and external forms of study is significantly in favor of the full-time form, 78% to 22%. But in general, the representation of full-time students in regular education is significantly higher. From the point of view of years, the first year of bachelor's studies has the highest representation. There are the most of these students in the department and therefore they have the highest representation in the research sample.

2 Results

With the first question of the questionnaire, we found out how teaching was conducted during the corona crisis, led by teachers. Respondents had a choice of 8 answers (possibility of selecting multiple answers) plus the option to add another answer (figure 2).

During the first wave, the University of Constantine the Philosopher and the Department of Technology and Information Technologies were not yet ready for online education. Teaching therefore took place most often in the form of assigning seminar papers (theoretical papers) 85% and through e-learning courses 85%. Values above 35% were also exceeded by education via e-mail 54%, education via video-conference systems 38%. Among the less used forms of education with a value of 23% was the form of education through the assignment of projects (practical work). Education through social networks, education through online consultation and education through Microsoft Teams received 15% and were the least used forms of education in the first wave of the pandemic.

The university and the Department of Technology and Information Technology have already prepared for the second wave, and the forms of education have also changed significantly. Video-conference systems became the most used form of education by 92%, which increased by 54% compared to the first wave. They were followed by the assignment of seminar papers (theoretical papers) 43%, compared to the first wave they decreased by up to 42% and slightly above 30% received education through the assignment of projects (practical papers) 35%. Education through e-learning courses reached 29%, which is a decrease of up to 56% compared to the first wave. Education via e-mail also deteriorated significantly (decrease by 34%), which reached only 20%. Education using Microsoft Teams also fell, reaching a value of only 6% compared to 18% in the first wave. Education via social networks, on the other hand, increased by 10% compared to the first wave to a final value of 25%. Online consultations received 14% which are practically identical results to the first wave of the pandemic.

The third wave was very similar to the second wave and the forms of education reached similar values. Education through video-conferencing systems decreased by only 1% to 91% compared to the second wave, but we do not consider this decrease to be statistically significant. On the contrary, the form of education in the form of assigning seminar papers (theoretical papers) increased by 25% to a value of 68% compared to the

second wave. An increase of 20% was recorded by education through assignment of projects (practical work), which reached a value of 55% in the third wave. Education via email rose to 45%, which is 16% more than in the second wave. Similar values as in the second wave were recorded by the form of education via e-mail, which received only 3% more in the third wave than in the second, a total of 23%, and education via online consultations, which rose by 4% compared to the second wave to the final 18%. Microsoft Teams, on the other hand, recorded an increase of 12%, and its use in education reached an 18% share during the third wave. Education through social networks was used the least in the third wave of the pandemic, in only 9% of cases. This form of education decreased by up to 16% compared to the second wave.

The fourth wave continues the trend of the previous two waves and its values are very similar. Education through video-conferencing systems reached a value of 87%, which is only 4% less than in the third wave and we do not consider this to be a statistically significant difference. Education in the form of assigning seminar papers (theoretical papers) decreased by 11% compared to the third wave but increased by 14% compared to the second wave. It settled at 57%. Compared to the second and third waves, the form of education through assignment of projects (practical work) decreased and stabilized at 23%. The decrease compared to the third wave was up to 32%, and the values did not change compared to the second wave. We explain this decrease by the fact that the teachers found a suitable ratio between the use of the video-conference system (87%) and the assignment of theoretical (57%) and practical papers (23%), a total of 80%. What the pedagogues explained through the video-conference system, they gave the students the task of working out with the help of seminar papers or projects. For e-learning courses, there was a decrease of 18% compared to the third wave, and the resulting value of this form of education stabilized at 27%, similar to the second wave. In education through Microsoft Teams, there was a decrease of 11% and the value stabilized, similar to the second wave, at 7%. Education via email is very similar. This has stabilized at a value of 20%. E-mail education dropped by 13% from the first wave to the final 10%, and this form of education had a downward trend practically from the second wave. Education through online consultation maintained stable values of around 15% in the first three waves, but in the fourth wave there was a drop to a total of 7%. This is due to the fact that the students already had enough resources (videoconferences, e-learning systems and e-mail communication) for education and online consultations were therefore not used so often. The form of education through the social network decreased by only 2% compared to the third wave to a total of 7%. This value gradually decreased and stabilized at the resulting value.

Based on the analysis, we conclude that during the four waves of the pandemic, the most significant changes in the form of education occurred after the first wave. In the first wave, the University of Constantine the Philosopher in Nitra and the Department of Technology and Information Technologies were not sufficiently prepared for distance education. During the next three waves, education at the department stabilized, thanks to the deployment of new technologies, such as its own Meet.UKF video-conference system, which was the most frequently used resource at the department. In the same way, pedagogues went through training to work with new technologies and found their own system of how to use these technologies effectively in education.

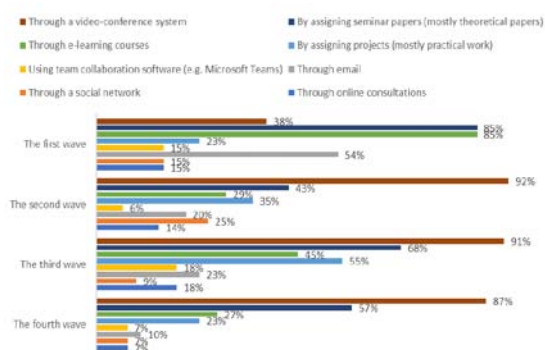


Figure 2 Course of teaching

With the second question, we investigated the most frequently used video-conference systems at the Department of Technology and Information Technologies of the UKF in Nitra (figure 3).

In the first wave, educators used various video-conferencing systems, and only later, when the university deployed its own Meet.UKF video-conferencing system, educators gradually began to use this video-conferencing system. The deployment of the university video-conference system was also reflected in the achieved results. The Meet.UKF university video-conferencing system scored 85%, which is significantly more than other video-conferencing systems. Messenger had a significantly smaller representation at 15% and WhatsApp also at 15%. Microsoft Team was used the least, only 8%.

In the second wave, Meet.UKF was dominantly used (100%). Compared to the first wave, its use increased by 15%. Educators got used to this video-conference system and the students also appreciated it. Its operation is simple, clear and enables easy sharing of presentations and the desktop. Since teachers and students liked Meet.UKF, the usability of other video-conferencing systems decreased significantly. Microsoft Teams became the second most used system. However, this only reached 2%. Messenger and even WhatsApp were not used by any of the educators in the second wave.

In the third wave, the situation in the use of video-conferencing systems began to stabilize. Just like in the second wave, Meet.UKF reached 100%. The use of the Microsoft Teams program increased slightly (by 7%), reaching a total of 9% and thus approaching the values from the first wave of the pandemic. Messenger and WhatsApp have practically ceased to be used in the educational process.

The Meet.UKF system was used by 100% of respondents in the fourth wave as well as in the second and third waves. Microsoft Teams, Messenger and even WhatsApp were no longer used in the fourth wave.

After analyzing the use of video-conferencing systems during the four waves of the pandemic, we conclude that the most frequently used video-conferencing system was Meet.UKF. Its simplicity of the user environment and possibilities of use in the educational process were appreciated not only by teachers, but also by students. Microsoft Teams became the second most used video-conferencing system. Microsoft Teams during the first three waves of the pandemic and its use was in the range of 2% to 9%. In the first wave, the university and teachers were still looking for a suitable video-conferencing system, which was reflected in the inconsistent use of video-conferencing systems.

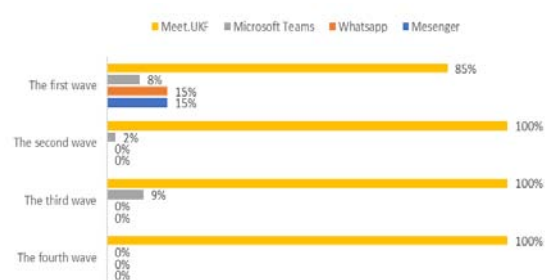


Figure 3 The most frequently used video-conference systems

As another question, we found out what the most frequently used e-learning systems at the Department of Technology and Information Technologies (figure 4) were. The university has been using and prefers its own e-learning system UKF EDU for a long time, which is built on LMS Moodle. However, some educators also use other e-learning systems in the educational process, such as LMS Moodle.

In the first wave, the dominant university educational portal UKF EDU reached 77% usage among respondents. It is followed by LMS Moodle with 23%. Since many respondents name the UKF EDU e-learning system as Moodle and vice versa, it is very likely that if they marked Moodle in the question, they actually meant UKF EDU. Therefore, this option to choose Moodle or UKF EDU was purposefully included in the question of the questionnaire. We assume that only a small percentage of respondents really used a different LMS Moodle than the university one called UKF EDU. Other e-learning systems were not used at the department.

In the second wave, the use of UKF EDU increased by 21% to a total of 98%. Respondents stated that they used LMS Moodle only in 2%. It follows that Moodle in the form of UKF EDU, or its modification, was used 100% in the second wave. No other e-learning system was used at the department even during the second wave.

The third wave saw a negligible increase in respondents' responses to the use of UKF EDU. This rose by 2% to a total of 100%. Compared to the first wave, this is an increase of 23%. On the other hand, LMS Moodle decreased by 2% compared to the second wave and stopped being used. Other e-learning systems were not used at the Faculty of Education in the third wave. The data obtained from the respondents indicate a trend of teachers focusing on using only the university e-learning system UKF EDU.

In the fourth wave, the situation with the use of e-learning systems stabilized and the respondents stated that the UKF EDU e-learning system was used up to 100%. No other e-learning systems were used.

During all four waves of the pandemic, the UKF EDU e-learning system was the most used. Gradually, all teaching staff got used to it, and in the fourth wave they practically only used this e-learning system. Which indicates the long-term sustainability of the use of this e-learning system in education.

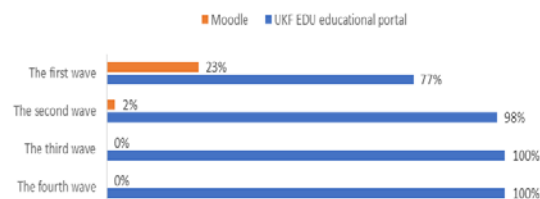


Figure 4 The most frequently used e-learning systems

The next question we asked was the quality of the educational materials that teachers at the Department of Technology and

Information Technologies provided to students during the pandemic (figure 5).

In the first wave, the respondents stated that 15% of the materials were average. Up to 77% of respondents considered the provided materials to be of high quality. 8% of respondents chose the answer very high-quality material. None of the respondents chose the option low-quality or very low-quality materials. We note that 85% of the educational materials were of a high-quality level (the sum of high-quality and very high-quality materials).

In the second wave, the situation with the quality of educational materials was very similar to the first wave. There were 0% of low-quality materials and very low-quality materials. Average materials rose by 9% to a total of 24%. Quality materials fell by 22% to a value of 55%. At the same time, high-quality educational materials rose to 22%, which represents a 14% increase compared to the first wave. In total, 77% of educational materials were of high quality.

In the third wave, none of the respondents stated that the educational materials were of poor quality or very poor quality. Average educational materials reached 14%, which is 10% less than in the second wave and practically identical to the first wave. The number of high-quality educational materials also increased by 22% to a final 77% compared to the second wave. However, very high-quality educational materials fell by 13% compared to the second wave to the resulting 9%. In total, however, 86% received quality educational materials. The third and first waves were practically identical in terms of the quality of the materials. The same winter semester and thus the use of the same materials from the previous period (first wave) also played a role in this.

In the fourth wave, the educational materials were rated very similarly to the second wave. This is due to education in the same semester (summer) as education during the second wave. Very poor-quality materials received only 3%. Low-quality educational materials reached a value of 0%. The value of average educational materials rose slightly (by 3%) to the final 17% compared to the third wave. Quality educational materials fell by 24%, to a total of 53%. Very high-quality materials, on the other hand, rose by 18% to a final 27%. In total, however, quality educational materials received 80%.

Based on the analysis, we conclude that students were provided with quality materials during all four waves of the pandemic. Respondents stated that on average for all four waves, 82% of the educational materials provided were of high quality. Slightly over 17% of educational materials were mediocre during all waves of the pandemic. Respondents classified less than 1% of the educational materials for the four waves of the pandemic in the group of very poor-quality materials. Based on these data, we conclude that the teachers at the Department of Technology and Information Technologies of the UKF in Nitra provided quality educational materials throughout the pandemic.



Figure 5 Quality of educational materials provided

With the last question, we found out how students would evaluate teachers and their education during the pandemic. The

students had the task of evaluating all the teachers who taught them during the given wave of the pandemic with one average grade (figure 6).

In the first wave of the pandemic, even if teachers were not ready for online education, they received positive or average rating. 15% of teachers were rated 1-excellent. Up to 31% of teachers were rated 2-Very good. A maximum of 38% of teachers received a grade of 3-Good. 15% of teachers received grade 4-adequate. None of the teachers received a rating of 5-Insufficient.

In the second wave, teaching staff gained more experience with online education, and the material and technical equipment necessary for teaching was also improved. All this had a positive impact on the educational process and on the evaluation of teachers. Compared to the first wave, there was a 3% increase in the best rating 1-Excellent, which rose to 18%. The 2-Very good rating rose even more. This evaluation of teachers increased by 22% to the final 53%. The 3-Good rating dropped by 11%. Educators received a 27% share in this evaluation. Only 2% of teachers were rated as 4-adequate. No teacher received a rating of 5 Inadequate.

In the third wave of the pandemic, there was a slight shift in the assessment. 9% fewer teachers received the best rating of 1-Excellent. In total, teachers received only 9% in this evaluation. In the rated 2-Very good there was an 11% increase compared to the second wave and the final score was 64%. The 3-Good rating did not change compared to the second wave and remained at 27%. No teacher received a grade of 4-Sufficient and a grade of 5-Insufficient. Compared to the second wave, there was therefore a slight deterioration of the results in the best-rated category, but a significant increase in the rating of 2-Very good. This may also be due to the difficulty of the subjects that were taught during this wave and semester.

In the fourth wave, there was a significant shift towards a better evaluation of teachers. In this wave, educators were rated the best of all four waves of the pandemic. 30% of teachers received the rating 1-Excellent, which is 21% more than in the third wave. The second-best rating was 2-Very good, achieved by 53% of educators, which is 11% less than in the previous wave. Only 13% of teachers received the grade 3-Good. It is 14% less than in the second and third waves. Three percent more than in the third wave and only 1% more than in the second wave, a total of 3% of teachers received a grade of 4-Sufficient. No one got a grade 5 Inadequate.

From the analysis of the results of the respondents' answers to this question, it follows that pedagogical workers were evaluated the worst during the first wave of the pandemic. In each subsequent wave, they scored better than in the previous wave. This was due to gaining experience with online education, training teachers to work with new digital resources, but also better material and technical security than in the first wave.

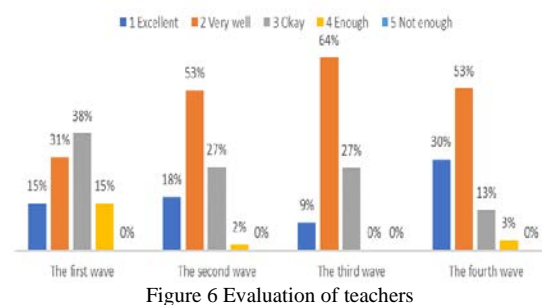


Figure 6 Evaluation of teachers

3 Conclusion

During the pandemic, between the first and second waves of the corona crisis, there was a significant shift in the quality of education at the Department of Technology and Information

Technologies of the University of Konstantin Filozof in Nitra. The management of the university and the faculty of education introduced several changes and improvements to the educational process before the second wave of the pandemic. Several series of trainings were held to work with the e-learning system, the MS Teams application, and the university video-conference system Meet.UKF. The Meet.UKF video conference system was improved in terms of both hardware and software, which in subsequent waves worked on better servers, which was also reflected in its stability and ability to work with a larger number of students without the application crashing. All these improvements were also reflected in the next waves.

At UKF in Nitra, a fixed schedule was introduced since the second wave of the pandemic, so that distance learning took place exactly at the same time as if it were applied face-to-face. This also contributed to the improvement of the educational process at the Faculty of Education. All these improvements resulted in a more stable educational process in the second, third and fourth wave of the pandemic, but also a greater degree of use of new technologies in education at the Department of Technology and Information Technologies. This contributed to a positive perception of the educational process by students and a positive assessment of the work of teachers by students.

From the point of view of sustainability, we note that the education system at the Department of Technology and Information Technologies throughout the pandemic was set up so that education could continue without major problems. As can be seen from the research, distance education gradually improved in the context of the corona crisis. The improvement was noticeable in each wave from the point of view of qualitative and quantitative indicators. Improving the quality of education came not only from the technical side - hardware, software, but also from improving the experience of the teachers of the Department of Technology and Information Technologies.

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Primary Paper Section: A

Secondary Paper Section: AM

TAX AND LEVY BURDEN OF WAGES IN THE CZECH REPUBLIC

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This work was created in connection with scientific research project of the VSB-Technical University Ostrava no. SGS 2022/1.

Abstract: The article deals with evaluating the influence of the tax and levy burden of wages on employment and tax revenue. The high tax and levy burden on wages is not favourable for the economy. The analysis results show that the increase in the tax and levy burden of wages has a negative effect on employment. When evaluating the effect of the tax and levy burden on tax revenue, the effect is different from the scope of used deductions. However, the long-term problem of the Czech Republic in comparison with other countries is not the tax burden on labour, but the related levy burden, which increases the price of labour and thus has a negative effect on the labour market from its transnational perspective. The analysis confirms that the Czech Republic remains among the countries with a high levy burden. To achieve the paper's objectives, methods of description, comparison, analysis, synthesis, and regression and correlation analyses are used. The added value and uniqueness of this article is, among other things, the fact that these indicators – effective, respectively, implicit tax rates on labour are calculated depending on the distribution of wages.

Keywords: Effective Tax Rate; Nominal Tax Rate, Personal Income Tax; Implicit Tax Rate, Tax Reform, Social Security Contributions, Wage.

1 Introduction

The article deals with analysing the tax and levy burden of income from dependent activity in the Czech Republic in the period 2003-2020 in several areas. First of all, it analyses how this tax and levy burden affects employment. The next part of the research analyses the impact of this tax and levy burden on the share of total tax revenue of the Czech Republic. One of the problems reducing the competitiveness of the Czech labour market is the high levy burden (Teplická and Daubner, 2013). Whether and how this levy and tax burden in the Czech Republic develops and changes in the mentioned period is the central topic of the last part of this research study.

The article's main objective is to analyse how effective tax rate and implicit tax rate on labour affect employment and whether implicit tax rate on labour affects the share of personal income tax to the total tax revenue. Another goal is to evaluate the development of effective tax rates and implicit tax rates on labour and determine whether there is dependence between the development of the values of these indicators.

The tax burden is represented by personal income tax, the levy burden by social security contributions, including public health insurance and social security premiums, and the contribution to the state employment policy.

The nominal income tax rate has been linear in the Czech Republic since 2008. However, it does not say much about the actual tax burden, and it is more appropriate to use the effective tax rate (hereinafter ETR) to assess the tax burden. The indicator of the implicit tax rate on labour (hereinafter ITR_L) is then used to express the total tax and levy burden of labour. Despite one nominal rate for social security contributions (hereinafter SSC), and since 2008 also for personal income tax, the tax burden is not the same for all taxpayers. The research question of this article is whether this burden affects employment and the share of personal income tax from dependent activity to the total tax revenue in the Czech Republic. The mentioned ITR_L and ETR indicators are used to analyse this research question. The uniqueness and added value of this article are that these rates (ETR and ITR_L) are calculated according to the distribution of wages in the Czech Republic as weighted averages. Another uniqueness of this text is the scope of the research period of 18 years, as studies analysing these factors in the conditions of the Czech Republic in relation to the distribution of wages and such a long period have not yet been conducted.

The article's introduction is followed by an outline of the theoretical background with a focus on the personal income tax. The following section is focused on the characteristics of the methods (regression and correlation analysis) and input data used. A linear regression model is used to analyse selected dependences. Further, the analysis is the main part of the text. The last part of the paper summarises the article's results and describes the limits of the analysis.

2 Literature review

The tax and levy burden of wages is the subject of research in the Czech Republic and abroad. One of the factors influencing the tax and levy burden on labour is the level of employment. According to Dalenberg and Partridge (1995) the high tax burden on labour negatively influences employment. Similar findings that a high tax burden does not positively influence employment were found by Mark et al. (2000); Kosi and Bojnc (2006). ITR_L or ETR are widely used to express the tax burden on labour. More about these indicators, e.g. Mankiw et al. (2009); Glday and Madl (2018).

Grace (2018) states that the probability that a company will employ labour is 1.18 percent higher when current tax rates increase by one percentage point. Other studies (Cutler et al., 2018; Burda and Weder, 2016) state that personal income tax on employment cannot be determined unambiguously and depends on the sensitivity to the income tax rate. For this reason, employment may rise despite rising tax rates.

There is a trend towards higher SSC and lower tax rates on personal income (Michaelis and Birk, 2006). In addition to personal income tax, payments for SSC are a significant factor influencing the amount of personnel costs (Teppererová, 2019; Prammer, 2019; Goudswaard and Caminada, 2015). The study Bauer and Riphahn (2002) analysing payroll and employment taxes in Germany, states that the employment rate is not negatively affected by the personal income tax but by SSC. According to the results of Bronchi and Burns (2001), the tax system of the Czech Republic is recommended by lowering SSC and increasing the reliance system on the personal income-tax system. Adam et al. (2019) mention that reducing the levy burden will positively affect employment. High personnel costs reduce the performance and competitiveness of companies. More about the performance of companies Knápková et al., (2014); Belas et al., (2020).

The amount of the tax burden affects employment and the state's total tax revenue. In the Czech Republic, personal income tax has significantly shared the state's total tax revenues, approximately 20% of the total tax revenue. Throughout the existence of income tax, there has been no significant volatility in this share, as in the USA (Garrett, 2009). Another important direct income tax is also corporate income tax (Konečná and Andrejovská, 2020; Moravec et al., 2019).

On the contrary, Chernick and Reimers (2019) claim that indirect taxes show a more stable share of tax revenue than direct taxes. According to Yilmazkuday (2017), the non-recommendation to increase income tax burden from dependent activities also follows. Rather, it is recommended to increase indirect or property taxes. More about property taxes e.g. Široký et al., (2015). Tax revenue is significantly affected by the constructional elements of taxes, so each tax reform changes the share of tax to the total tax revenue and the total amount of tax revenue (Mahdavi, 2008; Sanz-Sanz, 2016). The Laffer curve defines the theoretical relationship between tax rates and tax revenues. According to Lin and Jia (2019) in China, it is recommended to set the tax rate at 35% to maximize tax revenue. In determining the tax burden, the tax rate should be taken into account and the amount of the taxpayers' income or social status (Jordaan and Schoeman, 2015).

While the personal income tax burden is generally lower for families with children, mandatory payments on the SSC often do not take these factors during calculating these payments (Alvarez-Martinez and Polo, 2014). The already mentioned problem of the Czech Republic is the persistently high levy burden of labour (Kramer et al., 2016; Lyková, 2015).

The overview of studies shows that studies evaluating the impact of ETR, resp. ITR_L on employment, resp. tax revenue, as well as the analysis between the development of ETR and ITR_L have not yet been performed under the conditions of the Czech Republic. This demonstrates the certain uniqueness and added value of this article.

3 Methodology

A linear regression function generally determined (1) is used to model the dependence of the share of personal income tax from dependent activity to the total tax revenue according to the value of effective and implicit tax rates (1),

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon, \quad (1)$$

where Y is the dependent variable expressing the share of tax revenue of the personal income tax from a dependent activity to the total tax revenue of the Czech Republic, the values X_1 to X_6 are the average values of the indicator ITR_L, resp. ETR calculated as a weighted average according to the empirical distribution of wages in the relevant year. Specifically, X_1 expresses the ITR_L for the case where only the deduction per taxpayer is applied, X_2 the situation where, in addition to the deduction per taxpayer and the deduction per child are also used to reduce the tax liability, X_3 when the deduction per taxpayer and deduction for two children are used. The structure of indicators for ETR is similar, specifically X_4 expresses ETR if only the deduction per taxpayer is applied, X_5 cases where the deduction for taxpayer and for one child and X_6 when the deduction for taxpayer and for two children are used. ETR is generally determined by (2), ITR_L according to (3),

$$ETR = \frac{T}{Y}, \quad (2)$$

$$ITR_L = \frac{T + SSC_E + SSC_I}{Y + SSC_E}, \quad (3)$$

where T is the tax liability, Y the taxpayer's income, SSC_E is the social security contributions paid by the employer, SSC_I is the social security contributions paid by the employee.

According to data from income tax returns by individuals are deductions per taxpayer and children the most used deductions, specifically for the year 2020 the relief for the taxpayer was applied in 99% of tax returns, a tax credit for children in approximately 30% of tax returns (Financial Administration, 2022a). Compared to other tax deductions, these two are used by taxpayers for tax optimization the most often. A limiting aspect of this model may be the fact that non-taxable parts of the tax base are not taken into analyses, which do not affect SSC, but influence the tax base and the taxpayer's tax liability. Tax statistics of the Ministry of Finance of the Czech Republic (Financial Administration, 2022b) show that the most used non-taxable parts of the tax base for 2020 were deductions for private life insurance and amount of trade union contributions (approximately 20% of tax returns). However, no information is available on the average applied values of these non-taxable parts. For this reason, it is abstracted from non-taxable parts of the tax base. On the contrary, the uniqueness and added value of the study is the fact that effective, resp. implicit tax rates in the regression model are calculated as weighted values according to the percentage of employees in the bands of gross wages.

In addition to the analysis of factors influencing the share of personal income tax to the total tax revenue another such indicator is the motivation to work, which is expressed by the employment rate (Rick et al., 2018). According to Reiss and Schuster (2020), this indicator significantly affects ITR_L. Based on the above, relation (4) is formulated,

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon, \quad (4)$$

where Y is the employment rate, X_1 to X_3 express the average values of the ITR_L (X_1 for the case if the deduction of only the taxpayer is applied, X_2 per taxpayer and one child, X_3 per taxpayer and two children).

As follows from the part dealing with the theoretical background, one of the factors weakening the competitiveness of the Czech tax system isn't the high tax but the levy burden. Regression lines will be constructed to examine whether the spread between the tax and levy burden decreases or increases.

The angle between the regression lines is formed by two selection linear regression lines expressing the dependence between the characters y_1 and y_2 (Marill, 2004). y_1 is a variable expressing the tax burden on wages (ETR), y_2 is a variable expressing the tax and levy burden on wages (ITR_L). The angle $\cot g \varphi$ is formed according to Toka et al., (2019) by (5),

$$\cot g \varphi = \frac{|r_{xy}|}{1 - r_{xy}^2} \left(\frac{s_y}{s_x} + \frac{s_x}{s_y} \right), \quad (5)$$

where r_{xy} is the correlation coefficient, r_{xy}^2 is the coefficient of determination, s_x is the variance of the values of the character x , s_y the variance of the values of the character y .

According to the aim of the paper, the following research hypotheses were formulated:

- as the tax burden increases, the tax revenue increases,
- the tax and levy burden of labour negatively affects employment,
- the difference between the tax and levy burden of work doesn't change in the Czech Republic.

For analysis of the interdependencies between the selected indicators, the following resources have been applied:

- tax revenue of the personal income tax from a dependent activity in the Czech Republic from 2003 to 2020 were sourced from Financial Administration (Financial Administration, 2022c),
- employment rate and shares of employees in the bands of gross monthly wages were sourced from the Czech Statistical Office (Czech Statistical Office, 2022a and Czech Statistical Office, 2022b),
- for calculation of ETR and ITR_L Act. No. 586/1992 Coll. on Income Taxes, Act. No. 48/1997 Coll. on Public Health Insurance and Ac. No. 589/1992 Coll. on Premiums for Social Security and Contribution to the State Policy of Employment.

About the availability of data, the period 2003–2020 is analysed. The year 2020 is the last year for which data are available. The shares of employees in the gross wage bands have been published in the database of the National Statistical Office (Czech Statistical Office, 2022a) since 2003.

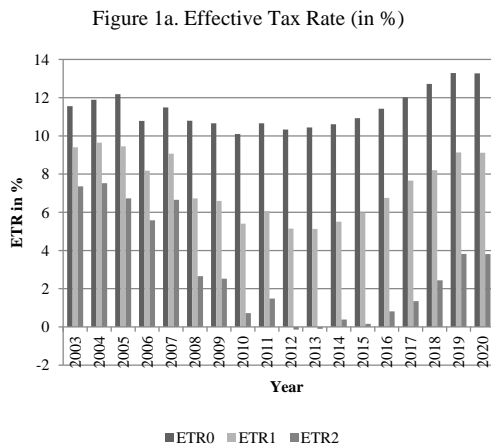
4 Results

Before the analysis of the dependence of the employment rate, resp. the share of personal income tax to the total tax revenue in relation with effective or implicit tax rates, the basic characteristics of each variable are performed using the tools of descriptive statistics.

4.1 Characteristic of input data

The weighted average effective, resp. implicit tax rates are graphically captured as one of the analysis's input data in Figures 1a and 1b. These values are calculated according to the distribution of wages in the Czech Republic in the period 2003–2020 for each analysed year in cases where only the basic deduction per taxpayer (ETR₀, ITR_{L0}), deduction per taxpayer

and one child (ETR_1 and ITR_{L1}) and deduction per taxpayer and two children (ETR_2 , ITR_{L2}) are applied.



Source: own research



Source: own research

In addition to the weighted average of ETR and ITR_L , the input database for the analysis is also formed by the values of the employment rate in the Czech Republic (EMP) and the share of personal income tax from the dependent activity to the total tax revenue (TR). For each variable, the minimum and maximum values, the mean and the median are indicated in Table 1.

Tab. 1: Overview of the Data Used in the Regression Analysis

Variable	Minimum	Maximum	Mean	Median
Y - TR	18.98	24.08	21.45	21.27
Y - EMP	64.23	76.90	68.62	66.56
X_1 - ITR_{L0}	41.12	44.20	42.59	42.80
X_2 - ITR_{L1}	37.62	42.33	39.63	39.49
X_3 - ITR_{L2}	33.69	40.76	36.35	35.43
X_4 - ETR_0	10.09	13.29	11.39	11.17
X_5 - ETR_1	5.12	9.64	7.39	7.20
X_6 - ETR_2	-0.14	7.52	2.98	2.47

Source: own research

4.2 Correlation analysis

As follows from the development of ETR and ITR_L , the tax burden does not follow the same trend and differs according to the applied deductions. In general, it can be said that taxpayers without the application other deductions than for taxpayer increase the tax burden on labour, the opposite trend can be observed for taxpayers with children. In some cases, the ETR is even in negative values. The share of personal income tax to the total tax revenue is not wholly constant it clearly does not show an increasing or decreasing trend. Is the change in the share of tax revenue related to the development of ETR or ITR_L values? Does the level of employment affect the tax burden on labour? Does SSC in the Czech Republic significantly increase the tax burden on labour? The following analysis attempts to answer these questions.

Tab. 2: Correlation Analysis. Source: own research

	TR	EMP	ITR_{L0}	ITR_{L1}	ITR_{L2}	ETR_0	ETR_1	ETR_2
TR	1							
EMP	-0.034	1.000						
ITR_{L0}	0.559	-0.170	1.000					
ITR_{L1}	0.546	-0.335	0.970	1.000				
ITR_{L2}	0.470	-0.524	0.889	0.970	1.000			
ETR_0	0.759	0.425	0.713	0.571	0.380	1.000		
ETR_1	0.737	-0.154	0.952	0.945	0.864	0.778	1.000	
ETR_2	0.583	-0.491	0.894	0.970	0.988	0.466	0.911	1

Source: own research

Table 2 presents the results of the correlation analysis. According to the results, a statistically significant positive correlation was indicated between ITR_{L2} and ITR_{L1} , between ETR_1 and ETR_2 , between ITR_{L2} and ETR_2 or between ITR_{L1} and ETR_2 . In general, the dependence between ITR_L and ETR is positive. If the tax burden increases for one group of taxpayers, the tax burden usually increases for the others. However, some moderately positive correlations, such as between ETR_0 and ETR_2 , suggest that this tax burden may not increase equally. In this case, the reason is the already mentioned increase in the amount of tax credits for children. A negative correlation was found only between the employment rate indicator and the ITR_L or ETR indicators. A more detailed evaluation of the effective tax rate, resp. the implicit tax rates on tax revenue (Model A) or the employment rate (Model B) are provided in the regression analysis in Table 3.

4.3 Regression analysis

The results of Table 3 show that both models have a high determination index R^2 . In the case of model A and B this means that more than 95% of the variance is due to the character X_N and less than 5% due to random deviations. There are also no autocorrelation according to the results of the Durbin-Watson test (more about the Durbin-Watson test Ali, 1987; Turner, 2019). According to the outcomes of the F-test, both regression models are statistically significant at 5% level of significance. This level of significance is recommended according to Yalcinkaya et al., (2017).

Tab. 3: Regression Analysis

Variable	Model A		Model B	
	Signif.	Coefficient	Signif.	Coefficient
$X_1 - ITR_{L0}$	0.017	-4.713	0.689	-0.876
$X_2 - ITR_{L1}$	0.096	2.865	0.008	7.396
$X_3 - ITR_{L2}$	X	X	0.000	-5.016
$X_4 - ETR_0$	0.006	3.841	-	-
$X_5 - ETR_1$	0.076	-2.125	-	-
$X_6 - ETR_2$	0.035	0.649	-	-
Constant	0.000	78.582	0.009	-5.379
Observation	18		18	
R^2	0.957		0.952	
Signif. F	0.000		0.000	
DW	2.304		2.144	

In the case of model A, which is generally formalized by (1), the regression coefficient X_2 and X_5 are statistically insignificant. The same situation is with regression coefficient X_3 , which is excluded from the model. After removing insignificance variables, model A has a form (6),

$$Y = -4.713 X_1 + 3.481 X_4 + 0.649 X_6 + 78.582 \quad (6)$$

The negative parameter X_1 of the model in equation (6) shows that the employment rate would increase if the labour tax burden decreased. On the contrary, the positive parameters for X_4 and X_6 , which express ETR, mean that even with the growth of the tax burden, an increase in the employment rate can be expected.

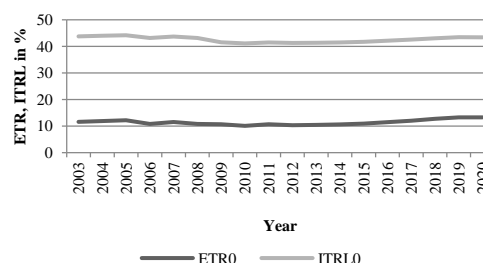
The extent to which the tax burden on labour affects the share of personal income tax from dependent activity to the total tax revenue is modelled in Model B in Table 3. For Model B, the explanatory variable X_1 is insignificant. The final form of the model is shown by (7).

$$Y = 7.396 X_2 - 5.016 X_3 - 5.379 \quad (7)$$

This equation illustrates that with a higher tax burden represented by ITR_{L2} it is possible that the personal income tax from dependent activities also has a higher share of tax revenue. However, as the tax burden on taxpayers decreases with applying the deduction for children, parameter X_3 is negative.

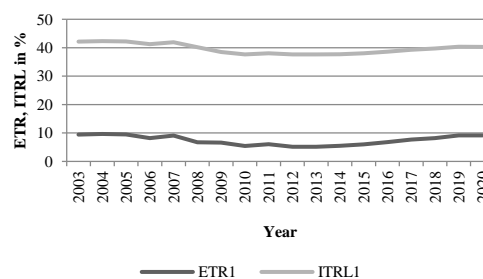
Using the angle between the regression linear lines, generally determined (5), the dependence between the development of ETR and ITR_L from 2003 to 2020 is examined in cases where the employee applies a deduction per taxpayer (Figure 2a), per taxpayer and one child (Figure 2b) and taxpayer and two children (Figure 2c). As in the previous analysis, this study's uniqueness and added value are that the ETR and ITR_L are weighted averages calculated for the wage distribution. The value of the *coig* φ angle enclosing the linear regression lines is shown in Table 4.

Figure 2a. Situation S_0



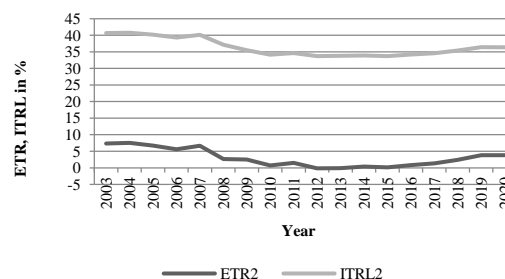
Source: own research

Figure 2b. Situation S_1



Source: own research

Figure 2c. Situation S_2



Source: own research

Tab. 4: Angle of Linear Regression Lines

Situation	Cotg
S_0	$\cotg \varphi_0 = \frac{0.712}{1-0.507} \cdot \left(\frac{0.87}{1.05} + \frac{1.05}{0.87} \right) = 18^\circ 79'$
S_1	$\cotg \varphi_1 = \frac{0.945}{1-0.893} \cdot \left(\frac{1.60}{1.75} + \frac{1.75}{1.60} \right) = 3^\circ 22'$
S_2	$\cotg \varphi_2 = \frac{0.988}{1-0.976} \cdot \left(\frac{2.70}{2.66} + \frac{2.66}{2.70} \right) = 0^\circ 69'$

5 Discussion

Figure 1 shows that the tax burden decreases with increasing deductions. Compared to the first analysed year (2003), the ETR decreased in cases where the deduction for children is applied due to the frequent valorisation of the values of this tax credit. On the contrary, the taxpayer's relief has not been increased, and so with the gradual increase in wages in the national economy, the tax burden is also growing. The trend of a gradual increase in the tax burden on labour since 2009 is also confirmed by the ITR_L . The results of Michaelis and Birk (2006) confirm that compulsory SSC influences the most significant tax burden on labour. This trend continues although the rate of SSC paid by the employee has decreased from 8% of the assessment base since 2009 to 6.5%, the rate of SSC paid by the employer from 26% to 25% since 2009, resp. to 24.8% from 1 July 2019.

Based on the results, it can be concluded that labour taxation impacts the employment rate. However, when analysing the effects and possible changes in the reduction or increase of the tax burden, it is also necessary to consider the declining stability of the legal environment, which affects both supply and demand for labour (Kotlán et al., 2019). Compared to labour markets in North America, these changes are less flexible (Nickell, 1997). The results also partially confirm the main findings of the study Kosi and Bojnec (2006), Goudswaard and Caminada (2015) or Tepperová (2019), which states that labour taxation has a negative impact on employment as a high tax burden increases labour costs.

Results Figure 2 confirms Mahdavi (2008) that tax reform can significantly change the tax burden and thus the share on tax revenues. In all analysed cases, the tax burden decreased between 2007 and 2008.

The results of model (6) confirm the conclusions of Hájek (2003). One of the ways to achieve a lower tax burden on labour is to transfer the tax burden from direct taxes to indirect taxes, which was partially done during the reform of public finances in the Czech Republic between 2007 and 2008. More about the analysis of selected indirect taxes e.g. Krzikallová and Střílková, (2016); David (2019).

Negative parameter X_3 in relation (7) follows that if the state goal is to increase the share of personal income tax from the dependent activity to the tax revenue, this increase can be achieved mainly through taxpayers who apply a deduction for one child or do not apply the deduction at all. Otherwise, it is more advantageous to recommend a change in the structural elements of the tax - for example, adjustments to the amounts of deductions for children or changes in the method of tax base construction. These changes subsequently affect tax progressivity, as Koskela and Schob (2009) stated. Another problem with changes in personal income taxation is long-run elasticities for wage tax (Havránek et al., 2016).

In addition to personal income tax, ITR_L also includes SSC paid by the employer and the employee. In the Czech Republic, the SSC paid by the employer enters the tax base and, according to Prammer (2019), increases personnel costs. This factor influences the share of personal income tax to the total tax revenue. Despite the nominal reduction in selected SSC rates, as shown by the ITR_L in Figure 1, SSC represents the highest component of the tax and levy burden of wages.

The closer the value of $\cotg \varphi$ is to zero, the higher dependence between the pairs of analysed values. In situation S_0 , where only the deduction for a taxpayer is applied, the degree of dependence

between ETR and ITR_L is the lowest. ITR_L ranges from 40 to 45%. If the high levy burden increased, the difference between the ETR and ITR_L values would decrease, which is not the case here. For this reason, the results of the Bronchi and Burns (2001) study on the high disparity between the tax and levy burden of labour are also confirmed. Therefore, a high levy burden on labour remains a problem. A slight decrease in the tax burden occurred only during 2005 and 2006 when the non-taxable part of the tax base was replaced by relief, and between 2007 and 2008, when the nominal progressive tax rate changed to a linear rate. The levy burden on wages decreased only between 2008 and 2009 with a decrease in the rate of social security premiums and contributions to the state employment policy paid by both the employee and the employer. In this case, there are partial identical conclusions of Adam et al. (2019) that reducing SSC has positive effects on labour costs. The rate of SSC was also changed during the year 2019, but due to positive economic growth and rising wages in the economy, this did not reduce the price of labour. This high levy burden can then lead employers to shift the burden of compliance with SSC back to employees in lower wages (Nielsen and Smyth, 2008).

A higher dependence between ETR and ITR_L exists when, in addition to the deduction per taxpayer, the deduction for children is also applied. This leads to a decrease in ETR values, leading to a reduction in ITR_L . Even in this case, the SSC is no longer graded according to, for example, the number of children supported by the taxpayer, which could be a criterion for determining the amount or rate of SSC (Alvarez-Martinez and Polo, 2014). The main factor reducing the tax burden on labour, especially in the middle of the analysed period, was the increase in tax credits for children, resp. replacement of non-taxable parts of the tax base by a tax advantage. As in the situation of S_0 , the average labour costs and the average effective tax rate have increased in recent years. Employers bear wage costs and related SSC in their costs (Tachibanaki and Yokoyama, 2008).

6 Conclusion

The article aimed to evaluate whether ETR resp. ITR_L affects employment and whether ITR_L affects the share of personal income tax from the dependent activity to the total tax revenue. Another goal was to evaluate the development of ETR and ITR_L rates. The analysis was performed under the conditions of the valid legislation of the Czech Republic in the period 2003–2020. The period for analysis is limited by the availability of data on the distribution of wages based on which the weighted average ETR and ITR_L were calculated. The analysis of dependencies with weighted averages of these values is one of the added values of this study.

The ETR and ITR_L rates were calculated for the three most frequent situations that arise in the Czech Republic for the taxation of income from dependent activities, i.e. the taxpayer applies the deduction only to himself, to the taxpayer and one child or the taxpayer and two children. The analysis was abstracted from the use of non-taxable parts of tax bases, which may be a limiting factor in this study.

The main results of this study include the finding that the tax and levy burden on wages has a negative impact on employment. If the connection of employment only with the effective tax rate were analysed, the partial opposite effect was found. The analysis examining the dependence between the share of personal income tax from the dependent activity to the tax revenue to ITR_L shows that to evaluate the impact of the share of tax revenue, it is necessary to analyse whether and how many deductions are used the taxpayer to reduce tax liability. Especially in tax levies in connection with personal income tax, the tax burden is in some cases zero, resp. negative. This is confirmed by the analysis results examining whether the levy and tax burden on labour is decreasing. This highest tax burden decrease occurred in connection with the reform of public finances in 2008. However, the share of SSC to the total tax and levy burden changes only minimally and thus, the high levy burden of income from dependent activity remains a problem.

This study has some limitations. First of all, is the fact that research was done under the condition of the Czech Republic. The analysis results can't be generalized to all European or world countries. The second limitation is data availability, especially wage distribution from the year 2003. This is the reason why analysis started this year. Finally, the third limitation is that tax burden calculation is abstracted from non-taxable parts.

The topic for further research in this area may be comparing these results with a similar analysis in another country, extending the period's length according to the availability of data, or considering changes in income taxation from dependent activity in future years.

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ACTUAL PAID COST OF EQUITY CAPITAL IN THE ACCOMMODATION AND FOOD SERVICES ACTIVITIES SECTOR 2015-2019

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Abstract: The aim of the paper is to determine the actual cost of equity capital in the accommodation and food service activities sector in the Czech Republic between 2015 and 2019. The data was collected from the Albertina database and processed based on changes in retained earnings from previous years and the current financial year's profit. The results show the resulting cost of equity capital, which in the years under consideration averaged between 32.40 - 67.25% and the median values ranged between 11.78 - 22.72%. The contribution of this paper can be seen in bringing the resulting value of the actual cost of equity capital in the selected industry on which subsequent predictions for the future can be based. The limitation of the research can be seen in the use of older data.

Keywords: Cost of equity, profit, profit sharing, dividends, average, median

1 Introduction

Accommodation, catering and food service activities providing short-stay accommodation and catering for immediate consumption fall under the tertiary sector, i.e. the service sector and can be classified as a smaller sector in the Czech Republic according to the Czech Statistical Office (ČSÚ, 2017). The sector is essential for developing human capital, improving the quality of life and, if local deficiencies are addressed, can also support the economic development of the country (Seráfica et al., 2021). In the period 2017 to 2019, there was an average of nearly 59 thousand active enterprises, both legal and natural persons (ČSÚ, 2022). Of some interest is that, according to the ČSÚ (2017), this sector in the Czech Republic is characterized by low wage levels, which ranged from 14,641 CZK to 20,722 CZK per person in the period 2017 to 2019 (ČSÚ, 2022). This sector was chosen because it is an important, unusually competitive and dynamic industry (Gheribi & Bonadonna, 2019) and is one of the most important sectors in the Czech Republic in terms of the number of business entities (Sejkora & Mlazovsky, 2021). Moreover, Kubičková and Nulíček (2018) argue that this sector is associated with the highest cost of equity capital in the Czech Republic and therefore, in our opinion, has great potential to provide us with an interesting opportunity to explore it.

The reason why we should address this topic is that it affects every business, as the cost of equity is linked to the return on equity that the business owner demands as a reward for the investment or project (Krulický et al., 2022). Thus, the cost of equity capital is also a very important component of investment decisions and business performance evaluation (Hu et al., 2018). The society-wide demand of this topic is that the majority of today's approaches focus on determining the opportunity cost of equity capital based on the risks and the amount of payment for its tolerance. Unfortunately, because of this, the approaches mentioned are limited in relation to the actual cost of equity paid. The limitations are attempted to be overcome by this paper, which by its existence draws attention to the reality of the actual cost of equity capital paid across the chosen industry.

The purpose of this paper is to determine the true cost of equity in the accommodation and food service activities sector for the period from 2015 to 2019. The period was chosen because it is the last few years for which all the data relevant to the calculations are available. For example, if we wanted to look further into 2020, we would find that this is not possible as the calculation for this year includes data from 2021 which is not yet available.

2 Literary research

The accommodation and food service activities sector is an important and extremely competitive and dynamic industry characterised by constant transformation and contributing significantly to the European economy (Gheribi & Bonadonna, 2019). The activity of this sector is often considered as a cause of potential adverse environmental impacts (Della Volpi & Paulino, 2018). This is echoed by e.g. Bux et al. (2022) who believe that this sector is starting to come under pressure precisely because of the consumption of resources such as food, water and energy and because of the production of waste. According to Gretzel et al. (2019), waste is behind this serious environmental and social problem because, in conjunction with tourism, food enhances the experience and serves as an attraction for visitors. There is also a positive trend towards the increasing importance of information and communication technology (ICT) in the sector, which shows a significant difference in its use between EU countries (Kozłowski et al., 2021). The use of ICT can be seen, for example, in the area of electronic sales records. The latter is a relatively new project in the Czech Republic, introduced in order to improve tax collection and reduce the share of the grey economy, which is one of the most problematic issues in this sector (Sejkora & Mlazovsky, 2021).

Profit is the fundamental reason for doing business (Straková, 2020) and is the result of the way unique resources are managed and used (Stoelhorst, 2021). For profit, according to Robson (2018), it is required by business ethics and economics to be maximised thereby contributing in some way to general social welfare, but according to Robson (2018) this is not necessary. This philosophy is also supported by, for example, Lee et al. (2017) who believe that a profit orientation undermines consumer support as consumers interpret this orientation as an expression of greed. In contrast, Zhou and Park (2020) evaluate profit-oriented strategy as a better alternative because it tends to outperform growth-oriented strategy in the long run due to the fact that growth-oriented strategy overburdens management, which in turn leads to inefficiency and a decline in firm performance. Munzhelele et al. (2021) also agree with this conclusion according to which growth-oriented companies also pay less dividends and are more aggressive due to their pursuit of growth.

Profit sharing is often associated with an economic perspective and when used as a motivational tool for employees it reflects organisational practices and management characteristics (Hambly et al., 2017). In the context of corporate governance, the payment of profit-sharing tends to be classified as an alternative strategy to increase productivity (Lima & Silveira, 2021). Increased productivity could also be due to the fact that paying shares to regular employees increases the likelihood of innovative activities (Belloc, 2022) and has a significant impact on reducing workplace conflicts (Fakhfakh et al., 2019). The productivity gains from paying shares are also agreed by Doucouliagos et al. (2019) who suggest that it works better when combined with capital investment and employee participation in decision-making.

Dividend payments are used by directors, among other things, to build reputation in the capital markets and to obtain external financing on favourable terms, and are more likely to resort to this method of financing when their businesses are underperforming and have high cash flow volatility (Sheikh, 2022). By paying dividends and disclosing corporate social responsibility information, they signal to the market and especially to institutional investors about the stable future performance of the company (Seth & Mahenthiran, 2022). According to Salman (2019), dividends are even the best source of information about a company's future. Kaplan and Pérez-Cavazos (2021) add that high dividends signal sustainable earnings, according to whom this applies mainly to companies

with insufficient investment opportunities. Here, the higher propensity to pay dividends for large and profitable firms with insufficient investment opportunities is also confirmed by Pahi and Yadav (2021).

The cost of capital is the most important factor for evaluating financing decisions, consisting of the cost of foreign and equity capital and representing the minimum rate of return that an investment or project must have to benefit the firm (Rowland et al., 2020). The cost of equity capital is then the portion of profit that its owners expect and receive for the contribution of their capital to the business, for example, in the case of joint stock companies through the payment of dividends (Martinovicova et al., 2019). Estimating it is not easy, as companies do not promise shareholders a rate of future investment appreciation, which is why opinions on its estimation vary widely and tend to be the subject of disputes (Růčková, 2019). The issue of determining the cost of equity is crucial for the development of organizations (Faiteh & Aasri, 2022). According to Mokhova and Zinecker (2019), the cost of equity can be classified as one of the basic elements of financial decision-making, which is influenced by internal and external factors. Important internal factors include dividend policy, stability of company earnings, ownership structure, flexibility in raising capital, and ability to predict financial performance. External factors include inflation, interest rates, financial market and sovereign debt, and risks associated with the banking system.

The cost of equity capital can also be reduced by disclosing environmental information as this reduces information asymmetry for investors (Yu et al., 2021). A similar conclusion is shared by Garzón-Jiménez and Zorio-Grima (2021) who suggest that capital providers penalize firms that pollute the environment. El Ghouli et al. (2018) and Gupta (2018) agree that more environmentally friendly practices can reduce the cost of equity, but Gupta (2018) argues that most of the benefits come from reducing emissions and unnecessary waste of resources. Investor protection also plays into the effect of CSR on the cost of equity. In countries with strong (weak) investor protection, the cost of equity falls (rises) when a firm invests in CSR (Breuer et al., 2018).

Investing in corporate environmental responsibility reduces the cost of equity financing worldwide (El Ghouli et al., 2018). However, how much impact these investments have depends on geography, as locating a company with better environmental conditions and a higher human development index reduces investors' perception of risk, which in turn reduces the cost of equity (Yu et al., 2021). Other influences on the cost of equity capital include: labor rights (Chu et al., 2019), intellectual capital disclosure (Mondal & Ghosh, 2020), government investment (Boubaker et al., 2018), and the intensity of market competition (Sassi et al., 2019), corporate reputation (Pfister et al., 2019), investment efficiency (Majeed et al., 2018), degree of uncertainty avoidance and leniency (Góis et al., 2018), adoption of new standards such as the International Accounting and Reporting Standard (Habib et al., 2019), and others.

Nowadays, a significant number of practitioners, analysts, investors, financial directors and academics use the capital asset pricing model (CAPM) to estimate the cost of equity even though there are many other alternative valuation models (Moyo & Mache, 2018). The CAPM method is internationally accepted, but it still contains many measurement errors and all parameters need to be estimated (Situm, 2020), while the estimation itself affects, for example, the composition of the market portfolio (Kamara & Young, 2018). Although the cost of equity estimates can be refined by including long-term averages of parameters and industry characteristics (McLemore, 2018), it is still a forward-looking estimation, which, moreover, can only be used for listed companies (Faiteh & Aasri, 2022). In practice, it is common for managers to determine the cost of equity capital using the CAPM model even retrospectively (Larocque et al., 2018), which highlights the need to start using methods other than those usually used to measure the cost of equity capital.

3 Materials and methods

All the data used for the calculations come from the Albertina database, which contains information on companies in the Czech and Slovak Republics. The data file was taken in excel format and contains a list of companies in the accommodation and food service activities sector in the Czech Republic, including data from the financial statements for the period 2015-2019.

As mentioned in the previous chapter, the CAPM model is most often used to determine the cost of equity capital. The model is suitable for identifying the cost of equity capital even though it has a number of limitations. However, it has no use for us due to the fact that it is used to estimate the opportunity cost of equity into the future and we are trying to find the actual costs that were actually paid in the past, which may be different. For this reason, we have chosen to use the methodology of finding the true cost of equity as in Krulický et al. (2022).

The following methodology will therefore be used to determine the actual cost of equity capital for the period 2015-2019 in the Czech Republic in the accommodation and food service activities sector:

In order to determine the profit shares paid in the selected year, the profit for the current financial year will be added to the retained profit for the previous year for each company, and then the retained profit for the selected year will be deducted from that figure. The resulting value, which will represent the profit shares paid, will represent the actual cost of equity.

For the retained earnings from previous years, the values available for the period will be selected.

After the calculations have been performed, only the relevant data needs to be filtered. It is therefore necessary to delete minus items and items in percentage terms exceeding the value of 100. The final value will be divided by the equity of the selected year and converted into a percentage.

Statistical functions such as mean, median, variance and standard deviation will be used to evaluate the results.

4 Results

Table 1. Cost of equity values for the period 2015 - 2019

Year	Average cost of equity	Median cost of equity	Total paid
2015	40,08 %	18,84 %	112 982 000,00
2016	32,40 %	17,29 %	388 610 000,00
2017	67,25 %	22,72 %	155 445 000,00
2018	36,43 %	19,66 %	90 819 000,00
2019	40,42 %	11,78 %	27 975 000,00
Total			775 831 000,00

Source: the Albertina Database

Table 1 shows us the average and median percentage and total paid profit shares in monetary terms of the cost of equity capital value over the selected period 2015 - 2019. The results show that the average and median cost of equity capital values are significantly different. In most years, the difference in values is about half, with the median value being about one-third of the average in 2017 and almost one-quarter in 2019. The highest cost of equity values for both the mean and median were achieved in 2017 and for total distributions in 2016.

Table 2. Selected statistical indicators from the resulting cost of equity for the period 2015 - 2019

Quantity	From the average cost of equity	From median equity	From the total shares paid out

Diameter	43,32 %	18,06 %	155 166 200,00
Median	40,08 %	18,84 %	112 982 000,00
Dispersion	151,63	12,99	15 318 751 144 560 000,00
Standard deviation	12,31	3,6	123 768 942,57

Source: the Albertina Database

Table 2 shows the selected statistical indicators from the resulting mean and median values of the cost of equity capital in the period 2015 - 2019 in which the indicators mean, median, variance and standard deviation are also visible. The results show that even though the mean and median values are very similar, the difference between the total profit shares paid is approximately 27%.

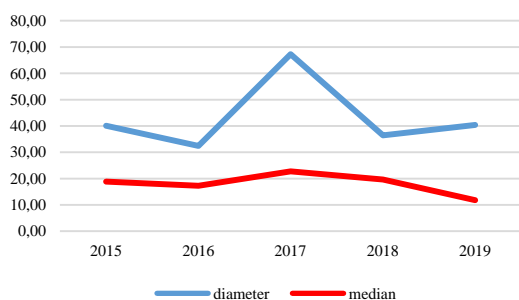


Figure 1. Development of average and median values of the cost of equity capital for the period 2016 – 2019; source: Own processing

Chart 1 shows the evolution of the average and median cost of equity for the period 2015-2019 by year. From the chart it can be seen that the trend in the values of both indicators is highly volatile over the years, especially in relation to the average. Both curves have a slightly decreasing course for 2016 after which in 2017 their course started to increase, very significantly in the case of the average. After this, the trajectories of both indicators fall again - again considerably in the case of the average. In the last year examined, the mean values of the cost of equity have an increasing trend and the median values a decreasing trend.

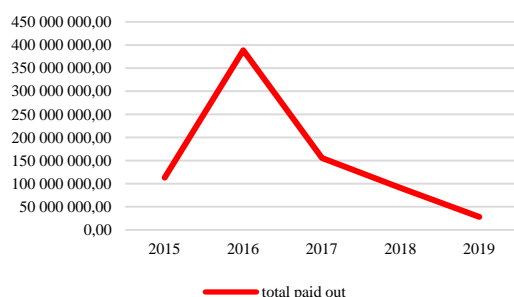


Figure 2. Development of total profit shares paid out in the period 2015 – 2019; source: Own processing

Chart 2 shows the total profit shares paid in the period 2015 - 2019 by year. From the progression of this chart, it can be seen that the highest profit shares were paid out in 2016 and in subsequent years the industry paid out fewer and fewer profit shares.

5 Discussion

Over the selected period, the average, 32.40%, 67.25%, 36.43%, 40.42% and median cost of equity values are 40.08%, 32.40%, 67.25%, 36.43%, 40.42% respectively, and the median cost of

equity values are 18.84%, 17.29%, 22.72%, 19.66%, 11.78% respectively. These results show that the average and median values are about twice as different in most cases, with the difference being about three times as large in 2017 and almost four times as large in 2019. Thus, we agree with Krulický et al. (2022) that it is particularly important to choose the right indicator when calculating the cost of equity, as otherwise their result may be significantly different. Currently, the CAPM model (Moyo & Mache, 2018) is most commonly used to calculate the cost of equity capital. However, if we want to know the actual value of the cost of equity capital that has been paid in the past this model is not suitable. The urgency of using non-standardized procedures can be seen in the fact that currently managers estimate the cost of equity capital using the CAPM model even into the past (Larocque et al., 2018). For this reason, the methodology of Krulický et al. (2022) was used, which is more suitable for calculating the actual cost of equity capital.

In the period elected, profit shares of CZK 112,982,000, CZK 388,610,000, CZK 155,445,000, CZK 90,819,000 and CZK 27,975,000 were paid. Given that the lowest value is nearly CZK 28 million and the highest is nearly CZK 389 million, it is evident from the above results that the amount of profit share payout was highly variable from year to year in the selected period 2015 - 2019. Profit shares tend to be associated with an economic view (Hambly et al., 2017) and high payouts signal sustainable profits (Kaplan & Pérez-Cavazos, 2021). If we apply this argument and look at the fact that the lowest values of profit shares paid out were recorded only in the last years of the period under consideration, we can conclude that the industry has stopped thriving over the years. In order to find out the specific causes we would have to find out the reasons for each of the firms considered in the chosen industry, but this is not the subject of this paper.

6 Conclusion

The objective of this paper was to determine the value of the true cost of equity in the accommodation and food service activities sector over the period 2015-2020. The objective was met by drawing data from financial statements downloaded from the Albertina database and using the methodology of Krulický et al. (2022) to calculate the true cost of equity for the accommodation and food service activities sector.

The main findings of the paper are the mean and median values of the cost of equity in the accommodation and food service activities sector over the period 2015-2019. The mean values ranged between 32.40 - 67.25% and the median values ranged between 11.78 - 22.72% over the selected period. Thus, the paper confirmed the findings of Krulický et al. (2022) on the necessity of choosing the right statistical indicator, as the differences between the two indicators mentioned can cause misleading results, even within a different industry.

The limitations of the research lie in the use of outdated data, which was used due to the fact that newer data is not yet available. Despite this limitation, the use of the results of the paper is great, as they can be used in practice to estimate the future cost of equity. This prediction will then be much more accurate than the standard methods used, as it will be based on historical data.

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THE PREDICTIVE IMPORTANCE OF EXECUTIVE FUNCTIONS AND INTERNET USE TO IDENTIFY ACADEMIC PROCRASTINATION DURING ADOLESCENCE

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Abstract: In the present study, we analyze selected predictors of academic procrastination in a representative sample of adolescents consisting of 159 respondents (64.2% females and 35.8% males). The age range of the respondents is from 16 to 25 years, with a mean age of 20.9 years (SD=1.95). Questionnaire methods were used to collect data, namely Lay's Procrastination Scale, Generalized Problematic Internet Use Scale 2, Internet Addiction Questionnaire, and Behavioral Self-Assessment of Executive Function Scale. The results indicate the predictive importance of executive functions as: Shifting, Emotional Control, Automonitoring, Initiative (Sig.<0.001), Monitoring of tasks (Sig.<0.01), Working Memory (Sig.<0.05). Further, the results indicated the predictive significance of the problematic internet use subscale Negative Outcomes (Sig.<0.05).

Keywords: academic procrastination, executive functions, Internet use, predictive importance, adolescence

1 Introduction

Executive functions have been shown to play a significant role in the planning and problem-solving process, hence their association with the concept of procrastination is highly significant. On the other hand, the link between academic procrastination and problematic Internet use is very significant. Despite the topicality of this issue, it is not sufficiently investigated how the problematic use of the Internet is related to students' academic procrastination, in the same way, the level of investigation of the interconnections between executive functions and academic procrastination is considered insufficient, so we decided to investigate this issue in the study.

1.1 Academic procrastination in relation to problematic internet use

Academic procrastination develops mainly during young adulthood, with several studies (Ferrari, Johnson, McCown, 1995; Gabrhelík, 2008) confirming that procrastination develops most around the age of twenty and tends to decline until around the age of sixty. Research (Steel, 2007; Kim, Seo, 2015; Doktorová, Kochanová, 2021) yields findings that approximately 80 to 95% of students are affected by academic procrastination, the essence of which is deliberate and unnecessary delay in starting or completing tasks. Research shows that this is a problematic behaviour that tends to be repetitive in university students, despite the fact that up to 95% of students want to reduce procrastination behaviour in their studies (Steel, 2007).

In recent years, the Internet has become an important element in relation to the responsibilities and needs of everyday life for all people, but especially for students, as through the Internet it is easy to access the materials and information that students need (Ya, Zhong, 2014). However, the Internet becomes a means for students to escape, avoid and distract themselves from their responsibilities and academic tasks (Thatcher et al., 2008; Kurajda, Doktorová, 2022). In our research to date, we observe that there is a relationship between procrastination and problematic Internet use, and thus it can be argued that the more participants use the Internet, the greater their level of academic procrastination, however, the predictive significance of problematic Internet use has not been confirmed (Kochanová, 2020). Similarly, Hayat, Kojuri, and Amini (2020) found in their studies that there is a positive relationship between Internet addiction and academic procrastination, finding that Internet addiction negatively affects behaviors such as doing homework,

studying for exams, and preparing for school. Gürültü (2016) found a positive significant relationship between social networking addiction and academic procrastination and found that social networking addiction explained approximately 19% of procrastination behaviors. There are also studies in the literature suggesting that academic procrastination is increased by problematic internet use (Günlü, Ceyhan, 2017). Another study found that when procrastination behaviors were reduced in adolescents, internet addiction and depressive symptoms were also reduced (Hernández et al., 2019). Overall, these findings suggest that various uses of the Internet appear to be one of the most common alternative activities used by procrastinators and may partially account for the negative associations between procrastination and adolescents' psychological functioning.

1.2 Academic procrastination in relation to executive functions

Procrastination has been linked and studied in a variety of contexts, for example, in relation to environment, task type, and personality, but it is surprising that research on its relationship with executive functioning has only recently begun. These recent studies (Rabin et al., 2011; Schweigerová, Slavkovská, 2015) suggest that these functions are significantly impaired in procrastinating individuals. Executive functions are defined by Williams, Suchy, and Rau (2009) as a set of diverse neurological processes that enable novel problem solving, behavioral change in response to new information, planning and generating strategies for action, and self-regulation of cognitions, behaviors, and emotions. Thus, executive functions serve as a label for a few cognitive functions such as planning, working memory, attention, inhibition, self-observation, self-regulation, and initiative. Executive functions are skills essential for mental and physical health, success in school and in life, or cognitive, social, and psychological development. We can consider Rabin, Fogel, and Nutter-Upham's (2011) research as the first ever to address the relationship between executive functions and academic procrastination. Their research showed that some subscales of the BRIEF-A were associated with procrastination. This observation was previously made by Schouwenburg (2002), who found that the level of procrastination was non-linearly related to a systematic approach to duties. Further, his research yields the finding that an individual who procrastinates is characterized by poor organization, which manifests itself in improper planning and time management. Schweigerová and Slavkovská (2015) found that there are significant differences in executive functioning between procrastinators and non-procrastinators. As we can see indicating the degree of academic procrastination through executive functioning has been very little researched so far, despite the topicality of this topic. Yet, executive functions play a crucial role in understanding the self-regulatory failure of procrastination. Effective stimulation of executive functions can prevent procrastination. Conversely, difficulties with executive functions may lead to the development of some psychopathological disorders, such as the emergence of procrastinatory behavior in this case. Several studies (Lavoie and Pychyl, 2001; Odaci, 2011; Thatcher et al., 2008) have addressed the detrimental effects of Internet use on the onset or exacerbation of procrastination, but not universally valid and definitive findings have yet been uncovered for us to examine in this paper. Similarly, the effect of executive functions on the emergence of Internet addiction has not yet been sufficiently explored. Therefore, the present study is aimed at elucidating the issue of academic procrastination in a population of students and to verify the predictive factors that act in its increase, and thus to investigate and verify the association of academic procrastination with Internet addiction and executive functions through a questionnaire method.

2 Methods

2.1 Research sample

The research sample consisted of university and high school students. Respondents participated in the research voluntarily by completing an anonymous battery of questionnaires in written or electronic form. Prior to completing the questionnaire battery, respondents were briefed on the purpose of the research as well as other information about the research. A more detailed description of the research sample is presented in Table 1. The average age of the participants was 20.9 years. The individual age distribution of the respondents is presented in Table 2.

Tab. 1 Characteristic of research sample based on gender, study and the using of the Internet

		Frequency	%
Gender	male	57	35.8
	female	102	64.2
Study	university students	126	79.2
	high school students	33	20.8
Time of using internet	10-60 min	7	4.4
	1-3 h	66	41.5
	more than 3h	62	39
	I can't judge	24	15.1
Preferred internet activity	playing online games	21	13.2
	online communication	107	67.3
	browsing the sites	21	13.2
	online shopping	1	0.6
	browsing pornographic sites	2	1.3
	study	7	4.4

Tab. 2 Age distribution of the respondents

Age	Frequency	%
16	5	3.1
17	6	3.8
18	6	3.8
19	14	8.8
20	26	16.4
21	40	25.2
22	35	22.0
23	10	6.3
24	14	8.8
25	3	1.9
Total	159	100

2.2 Measures

According to the set objectives, we have chosen an adequate methodology to carry out the research. The test battery consisted of several methods, including basic socio-demographic data (gender, age, study, time of using internet,...), the Procrastination Scale for Students, the Generalized Problematic Internet Use Scale 2, the Internet Addiction Questionnaire and the Behavioral Self-Assessment of Executive Function Scale. Full instructions were given in the header of the questionnaires and took no more than 30 minutes to complete in total. As all the selected methods were taken from the English original, it was necessary to translate the methods and check their validity. The translation of each method was reviewed by a translator and then assessed by independent expert psychologists. The methods thus underwent both linguistic and professional proofreading by experts. Through these actions we ensured the validity of the methodologies. After data collection, the psychometric parameters of the methods will be verified, through Cronbach's alpha.

The constructed test battery consisted of the following parts:

1. Author's questionnaire - to find out basic demographic information about the respondents.
2. Procrastination Scale for Students- PSS (Lay, 1986) which was used to map academic procrastination. Using it, we get information whether an individual possesses and to what extent he possesses procrastination. It contains 20 questions that relate to procrastination of activities not only related to school duties. Cronbach's alpha reached a value

of 0.881, on the basis of which we can consider the questionnaire internally consistent.

3. Generalized Problematic Internet Use Scale 2- GPIUS2 (Caplan, 2010), which is a screening tool for identifying problematic Internet use in adolescents and young adults. It contains 15 items that are divided into five subscales (Internet communication preference, mood regulation, cognitive bias, compulsive Internet use, and negative consequences). The Cronbach's alpha of the questionnaire was 0.902, and the Cronbach's alphas for each subscale were as follows: internet communication preference- 0.867, mood regulation- 0.870, cognitive bias- 0.836, compulsive internet use- 0.902, and negative consequences- 0.878. Based on the above Cronbach's alpha values, we can consider the questionnaire as internally consistent. Further, we used the Internet Addiction Test (IAT) questionnaire (Young, 2009), which consists of 20 items, to map the extent of Internet addiction. The Cronbach's alpha of the questionnaire was 0.930, based on which we can consider the questionnaire as internally consistent.
4. The Behavioral Self-Report Scale of Executive Functioning - BRIEF (Roth, Isquith and Gioia, 2005) was used to map executive function. It is one of the most recent instruments to measure executive functions. It is composed of 9 subscales: inhibition (8 items), cognitive flexibility (6 items), self-observation (6 items), emotional control (10 items), planning (10 items), initiative (8 items), task monitoring (6 items), working memory (8 items), and organization of materials (8 items). The Cronbach's alpha of the questionnaire was 0.964, and the Cronbach's alphas for each subscale were as follows: inhibition- 0.804, cognitive flexibility- 0.776, emotional control- 0.930, self-monitoring- 0.803, initiative- 0.800, working memory- 0.836, planning- 0.795, task monitoring- 0.671, and organization of materials- 0.899. Based on the above Cronbach's alpha values, we can consider the questionnaire as internally consistent.

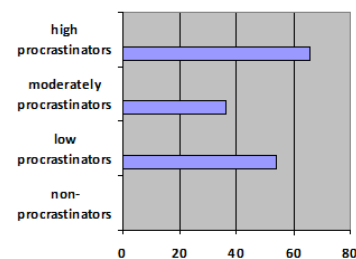
2.3 Procedure

The research has an exploratory-correlational quantitative design, with data collected through questionnaire methods. Part of the questionnaires were distributed offline through personal contact with the respondents on the campuses of their colleges and high schools, while another part of the questionnaires was distributed online through online data collection by means of an online questionnaire. Further, the data were statistically analyzed using IBM SPSS Statistics 23.0 for Windows mathematical and statistical software (descriptive statistics, regression analysis).

3 Results

In the following chart we show the representation of forms of procrastination. As we can see in Graph 1, there is no respondent in our research sample who does not procrastinate. Also, we can see that there are 54 low procrastinators, 36 moderately procrastinators and 66 high procrastinators.

Graph 1 Prevalence of academic procrastination



Linear regression analysis was used to test the predictive significance of the executive functions in relation to academic procrastination (Table 3). In general, the model appears to be appropriate ($F= 24.863$; $Sig.<0.001$). The variables that

significantly contribute to the increase or decrease of academic procrastination are shifting ($\beta=0.476$), emotional control ($\beta=0.358$), automonitoring ($\beta=0.382$) and initiative ($\beta=0.596$) at Sig.<0.001 level of significance, task monitoring ($\beta=0.327$; Sig.<0.01) and working memory ($\beta=0.265$; Sig.<0.05). Since the research sample consists of 159 participants, which represents enough participants for comparing the magnitude of each predictor (Green, 1991), we can conclude that the most significant predictor of academic procrastination, when considering the influence of other predictors, is initiative. The other executive functions, namely inhibition, planning and organization of materials appear to be insignificant in relation to academic procrastination.

Tab. 3 Regression model for individual executive functions as predictors for academic procrastination analyzed by the Enter method

Predictors	R	R ²	B	β	t	Sig.
Inhibition	0.775	0.576	-0.192	-0.087	-0.702	0.484
Shifting			-1.385	-0.476	-5.637	0.000
Emotional control			0.523	0.358	3.935	0.000
Automonitoring			-1.136	-0.382	-3.963	0.000
Initiative			1.306	0.596	6.959	0.000
Working memory			0.581	0.265	2.584	0.011
Planning			-0.082	-0.041	-0.421	0.674
Monitoring of tasks			1.111	0.327	3.413	0.001
Organization materials			0.053	0.030	0.381	0.445

We then analyzed the predictive significance of areas of problematic Internet use and Internet dependence on academic procrastination (Table 4). The model appears to be appropriate ($F= 15.827$, Sig.<0.001). As it appears, only negative consequences of Internet use led to an increase in academic procrastination ($\beta=0.219$; Sig.<0.05).

Tab. 4 Regression model for subscales of problematic Internet use and Internet addiction as predictors for academic procrastination analyzed by the Enter method

Predictors	R	R ²	B	β	t	Sig.
Preference for communication via the internet	0.407	0.133	-0.182	-0.066	-0.817	0.415
Mood regulation			0.275	0.115	1.277	0.204
Cognitive preoccupation			-0.170	-0.065	-0.507	0.613
Compulsive internet use			0.223	0.090	0.688	0.493
Negative outcomes			0.665	0.219	2.202	0.029
Internet addiction			0.174	0.176	1.407	0.161

4 Discussion

Based on the presented results, we can say that the prevalence of academic procrastination in our research was approximately 64%, which means that more than half of the students find their procrastination problematic, which is consistent with previous research (Steel, 2007; Kim, Seo, 2015, Doktorová, Kochanová, 2021). On the other hand, research (Rabin et al., 2011) found that only about half of students regularly procrastinate. Research (Doktorová, Kochanová, 2021) point that up to 44.2% of the research sample represented group of moderately procrastinators, followed by low procrastinators (27,3%) and high procrastinators (25,6%). Only 2,9% of the sample represented non- procrastinators. In our research, we found that the most represented group of procrastinators are high procrastinators, followed by low procrastinators and moderately procrastinators. Compared to the study of Doktorová and Kochanová (2021) in our research none of the students were non- procrastinators. We can conclude that procrastination becomes a dominant and problematic issue for students since almost half of the students postpone their duties.

The executive functions that emerged as significant predictors for academic procrastination in our research were Shifting, Emotional Control, Automonitoring, Initiative, Task Monitoring, and Working Memory, with executive functions explaining 57.6% of the prevalence of academic procrastination. Similarly, Rabin, Fogel, and Nutter- Upham (2011) found that executive

function such as initiation, plan/organize, inhibit, self-monitor, working memory, task monitor, and organization of materials were significant predictors of academic procrastination. Further, the research (Schweigerová, Slavkovská, 2015) confirmed the reduced level of executive functions such as inhibition, shifting, automonitoring, initiative, working memory, planning, monitoring of tasks and organization materials in procrastinating students. Like the study by Gutiérrez-García et al. (2020), students who procrastinated the most had difficulty planning and organizing their school activities. People who do not show a great deal of shifting may find it difficult to start work and need to be more proactive or use more prompting to get started on an activity they should be doing (e.g., preparing for an exam). Since it is the lower level of self-monitoring that has been shown to be significant for higher levels of procrastination, it is possible that these individuals approach their own tasks in a non-systematic way and thus become overwhelmed when faced with large amounts of information (Roth et al., 2005). Higher levels of dysfunction in the areas of ability to monitor one's tasks and working memory predict higher rates of academic procrastination. Better self-monitoring, which represents one's ability not to succumb to momentary ideas and impulses, and better ability to process information thus represent a protective factor against procrastination, as they allow for better control over one's own behavior. Persons who do not succumb to momentary ideas and do not prioritize short-term benefits over long-term benefits (Tice, Baumeister, 1997). The presented results indicate the importance and necessity of working with students to improve the skills of more effective self-regulation as well as strategies for planning and solving problems of their duties.

Academic procrastination is generally described as the inability of adolescents to complete school-related tasks in a timely manner (Steel, 2007), with adolescents increasingly resorting to the virtual world (Aslan, 2019), which accounts for the positive relationship between Internet addiction and academic procrastination. Although there is a relationship between these variables, the studies addressing the predictive significance of problematic Internet use for the occurrence of academic procrastination is under-researched. The subscales of problematic Internet use or Internet addiction that emerged as significant predictors for academic procrastination in our research was only subscale Negative outcomes explaining 13.5% of the prevalence of academic procrastination. The predictive significance of another subscales and Internet addiction was not confirmed in our research, despite several studies (Lavoie, Pychyl, 2001; Reinecke et al., 2018) considering Internet applications and the Internet itself as a cause of procrastination. Odaci (2011) argues that academic procrastination is a predictor of problematic Internet use among college students, but he finds that procrastination does not significantly contribute to problematic Internet use but speaks to the possible opposite effect of these variables. Thus, it is possible that this variable is not a cause but a consequence of procrastination. The literature confirms that academic procrastination is one of the significant predictors of Internet addiction (Uzun, Önal and Tokel, 2014). However, the truth remains that there are variables that increase the rate of procrastination, such as imbalances in behavior, control, and planning that can develop because of uncontrolled Internet use (Casey et al., 2005). Recent research has found that students who experience academic procrastination experience academic anxiety and have low self-regulation skills, increasing their problematic smartphone use (Yang, Asbury, Griffiths, 2019). Thus, it can be said that the time students devote to internet use affects their academic success stems from the fact that there is endless data on the internet and the benefits of students in this regard, with their academic procrastination consisting of putting off homework and assignments by spending their free time on the internet.

4.1 Limits

We consider self-assessment scales to be the most significant limit, especially the detection of executive functions through a questionnaire, where we relied on the respondents' ability to

assess themselves. With this limit comes another limit, namely misunderstanding of the assignment, or dishonest answers in the rating scales and to the questions. We also consider an insufficiently large sample as a limit, while increasing the research sample could decrease the degree of generalization to the entire population.

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ROBUST BUDGETING IN INTERNATIONAL UNIONS

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Abstract: As international economic integration advances the issue of budgeting in inter(supra)national unions becomes more and more important. To ensure stable, effective and efficient functioning of the union its budgetary system should be designed based on a number of rules. In the article we analyze budgetary structures of current international unions and combine the revealed rules into six basic principles. We describe and substantiate these principles. In addition, some theoretical tools that could be applied in scientific validation of a supranational budgetary model are proposed.

Keywords: supranational, budget, principle, rule, international union, fiscal.

1 Introduction

Successful operation of any international union¹ is not possible without adequate financial provisioning. This seems to be a sufficient reason to bring academic interest to the issue of supranational budgeting. However, since the theory of economic integration started to evolve this issue did not get enough attention. The issue of budgeting in international unions is not mentioned in any of the classical books in this field (see Tinbergen 1965, Balassa 1961, Viner 1950, Meade 1955).

Only in 1970-th budgeting in international organizations (including unions) started to be an object of academic research. A few attempts to apply existing methods and approaches of public budgeting theory and of the theory of public finance to certain international organizations were made. One group of scholars focused on search of optimal behavioristic model (method) of budgeting in international organizations (see, e. g., Hoole et al. 1976, 1979). A second group tried to explain and/or propose optimal structure of the European Union (EU) budgetary system based on postulates of the theory of fiscal federalism and principles of public sector economics, the theory of public finance and others (see, e. g., Čeponytė 2015; Begg et al. 2008; Figueira 2008; Mattila 2004; Persson et al. 1996; Tabellini 2003; Deugd et al. 2013; Gehring and Schneider 2018).

As a result of deepening regional economic integration and the emergence of pioneer economic unions methodological developments directly addressed to budgeting in international unions appeared (see, e. g., Alesina et al. 2005; Boiar 2015, 2014; Carruba 1997; Simon and Valasek 2017). However, not only impulses from practical sphere caused the rise of theoretical elaborations as for supranational finance. There is also cognitive interest in the issue, in the sense that supranational budgeting differs from budgeting at the national or subnational levels.

This argumentation led us to intention to contribute in this article to the theory of supranational finance and outline basic principles of budgeting in international unions. To do so we first analyze budgetary setups of current international unions (section II), then, based on this analysis, we generalize the revealed rules and patterns into six principles of supranational budgeting, where the principle of scientific validity is the key one (section III). Finally, we conclude (section IV).

¹ An international union in this study is regarded as a voluntary association of sovereign states that decide to centralize or coordinate certain policies and confer corresponding powers to central supranational bodies.

2 Financial resources for economic integration

The most widespread form of international economic integration² in the modern world is a free trade area (FTA). Treaties establishing the majority of FTAs do not foresee the creation of separate budgets to finance the planned activities within the union. The activities are usually financed directly from national budgets of the member-states of a particular union in accordance with their commitments. Even the existence of central governing bodies does not mean that they operate its own budget. In the case of the North American Free Trade Agreement (NAFTA) (as of July 2020, the U.S.-Mexico-Canada Agreement (USMCA)) the parties (USA, Canada, and Mexico) agreed to establish territorial sections of the central NAFTA's authority (named Secretariat) in the capital of each member-state and finance each section's administrative expenditures from the national budget of the corresponding member-state (NAFTA 2019).

However, there are a few examples when governing institutions of a FTA are empowered to operate its own budget. For example, the Secretariat of the Central European Free Trade Agreement (CEFTA) has its own budget, which is funded by contributions from the CEFTA member-states (Boiar 2014).

One can notice a pattern that common supranational budget is usually formed in the FTA-s that are strategically oriented to advancing to higher forms of integration. This is proper to the South African Development Community (SADC) which besides a FTA has implemented a number of sectoral cooperation programs and has taken some efforts to establish a customs union, a common market and a monetary union. The budget of SADC covers primarily administrative expenditures. Some insignificant program expenditures are also financed from the supranational budget but most of the programs are funded directly from the national budgets of the member-states (SADC 2009).

The contributions of the SADC member-states to the common budget are calculated based upon their GDP. Nevertheless, SADC is significantly dependent on the external sources of funding. From the total SADC budget of USD 39.36 million in 2007/2008 fiscal year, 41.1 % were grants from international organizations and developed countries. The EU, the African Development Bank, the World Bank, the Forum for Agricultural Research in Africa, the Food and Agriculture Organization of the United Nations, Belgium, the United Kingdom, France, Switzerland were among the main donors to the SADC budget (SADC 2009).

The Common Market for Eastern and Southern Africa (COMESA) is also very ambitious in its integrational goals international union. The Secretariat and the COMESA Court are the permanent bodies of this organization and they have their own administrative budgets. Their estimates are calculated with respect to the differentiated member-states' contributions (established by the COMESA Council) and the amount of resources received from other sources (grants, donations, income of the COMESA institutions) (Boiar 2014). Program expenditures are directly related to the formation of the common market. They have to be covered by special duty called the Common Market Levy (see article 168 of the Agreement Establishing the COMESA (COMESA 1993)).

² The forms of economic integration according to B. Balassa (1961, p. 174) include a free-trade area, a customs union, a common market, an economic union and complete economic integration.

It should also be noted that it is hard to say apart the real form of integration for some international unions as they are one form by name, and in fact another. This is due to the differences between the goals set in the founding treaty and real achievements in the process of integration. For example, the European Free Trade Association (EFTA) is, in fact, a common market with the first signs of an economic union. The organization with the name "Common Market for Eastern and Southern Africa" has only managed to create a FTA and to implement a number of sectoral cooperation programs.

The Council of the organization sets the general legal framework for the budget process at COMESA, including approval of the annual budgets of institutions and programs. Also, the external audit of financial activities and penalties for non-execution by the member-states of their budgetary obligations to the organization are foreseen (see article 170 of the Agreement Establishing the COMESA (COMESA 1993)).

The Association of Southeast Asian Nations (ASEAN) is an international union with geopolitical and economic objectives. In terms of economic integration, ASEAN is a free trade area with the first signs of a common market. The administration of the ASEAN activities is carried out by the Secretariat, which has its own budget. It is funded by equal annual contributions from ASEAN member-states. Budgeting is based on rules and procedures that are in line with international standards and are approved by the Coordination Council. The budget of the organization is the subject of internal and external audit (see articles 29–30 of the Association of Southeast Asian Nations Charter (ASEAN 2007)).

The South Asian Association for Regional Cooperation (SAARC) is another union which is a free trade area from the standpoint of the forms of economic integration. The main achievements of SAARC are the creation of the South Asia Free Trade Area (SAFTA) and the establishment of the SAARC Development Fund, which finances socio-economic development and cooperation projects. SAFTA is seen as an intermediate step towards the creation of a customs union, a common market and an economic union.

The specific characteristic of budgeting in SAARC is that different institutions, projects and programs are funded through different schemes that are the subject of separate political decisions of the member-states. These are primarily direct contributions from the national budgets but their calculation does not have single rule and separate arrangements are applied to certain members (Boiar 2014).

The main source of funding for program expenditures is the SAARC Development Fund. The expenditures of the Fund are divided into three groups: the “social window” (education, health care, human resources etc.), “economic window” (trade, production, technology etc.) and the “infrastructure window” (energy, transport, environment etc.) (SAARC 2008). The basic method of financing is the allocation of grants to projects, selected on a competitive basis.

The activities of some FTAs are administered and funded within the framework of international organizations of a wider format. This, in particular, concerns the Greater Arab Free Trade Area (GAFTA), a project of the Social and Economic Council of the League of Arab States. The budget of the League of Arab States is financed by differentiated contributions from the national budgets of the member states.

A customs union is another rather widespread form of economic integration. The financial provisions of all customs unions identified by us are carried out from special centralized budgets. However, the structure and mechanisms of arranging the revenue and expenditure parts vary significantly among the unions. Thus, in the Southern African Customs Union (SACU), the main source of revenue for the common budget is the so-called Common Revenue Pool. It consists of all the customs and excise duties collected on the territory of the customs union during a fiscal year. However, only a small part of them is directed at financing the activities of the union itself (subject of decision of the SACU institutions). The major share of the Common Revenue Pool is redistributed among member-states in a rather complicated manner (SACU 2019).

In 2012 38.2 % of the SACU expenditure were directed to finance the program “Corporate Services” (information and technical support to the SACU institutions), 22 % – to develop trade and customs infrastructure, 14,8 % – to harmonize policies and research (SACU 2012).

The financing system of the Economic Community of West African States (ECOWAS) is rather complicated. The reasons are that the ECOWAS governing bodies and agencies are funded according to different schemes, and both monetary unions that are developing within the organization have their own budgets.

The budgets of the institutions and most of the agencies are approved by the Community Council. The Commission performs the functions of budgetary management and internal financial audit in relation to the administrative expenditures of the ECOWAS institutions (see articles 69 and 75 of the Revised Treaty of the ECOWAS (ECOWAS 1993)). Development projects (investment, infrastructure, technical support, etc.) are funded through a special financial institution – the ECOWAS Bank for Investment and Development (EBID). Of all the institutions this body has the largest budget. The governing bodies of the organization have established a number of specialized agencies that serve as the ECOWAS sectoral policy coordinators. Most of them have their own budgets.

The expenditures of all ECOWAS institutions and some agencies are funded from a Community levy and other sources. This levy is established as a percentage of the total value of import duty derivable from goods imported into the Community from third countries (see articles 70 and 72 of the Revised Treaty of the ECOWAS (ECOWAS 1993)). In 2013 it was 0.5 %.

Another customs union was created within the Eurasian Economic Union (EEU). It has its annual budget which is financed by contributions from the member-states (EEU 2014). They are established as shares in the general budget in proportion to each member’s share in the total amount of the import duties collected at the external border (EEU 2019). The EEU budget covers primarily administrative expenditures. The financing schemes for the EEU cooperation programs are decided upon by the Supreme Eurasian Economic Council for each program separately. Usually, the responsibility for financing such program activities is put upon the national governments and carried out directly from budgets of the participating member-states.

The Andean Community (Spanish: Comunidad Andina, CAN) is a customs union where each governing institution has its own budget. The structures of the revenue and expenditure parts of these budgets are approved by the decision of the Commission (the main political body). All budgets are made up of direct contributions by member-states from their national budgets (see article 22 of the Official Codified Text of the Andean Subregional Integration Agreement (CAN 1969)). Expenditures of all bodies except the General Secretariat (the main executive body) are administrative. The sources for funding program expenditures of the Andean Community include non-administrative expenditures of the General Secretariat and special extra-budgetary funds, namely the Andean Development Corporation and the Latin American Reserve Fund.

Another international union which has created a customs union and is moving towards the establishment of a common market is the Southern Common Market (Spanish: MERCOSUR). Like in the case of the Andean Community each permanent MERCOSUR institution has its own budget. The administrative expenditures are funded equally by all member-states. The program expenditures (e.g., the Structural Convergence Fund, the Social Institute, etc.) are covered by the members depending on their level of participation in the corresponding programs. Direct transfers from national budgets are the main source of revenues for the budgets of supranational bodies. The Council of the Common Market (MERCOSUR highest authority) approves the budgets and other financial decisions (MERCOSUR 1994).

The Union of South American Nations (Spanish: UNASUR) is an intergovernmental organization created to unite the two South American customs unions (MERCOSUR and the Andean Community) and to form a single economic, socio-cultural space in the region. The body responsible for implementing the UNASUR policy is its General Secretariat. It operates the union’s budget, which consists of differentiated national

contributions – the subject of decision by the Foreign Affairs Council. The member-states' economic capacity, shared responsibility and equity are the principles underlying the budget decision (see article 16 of the South American Union of Nations Constitutive Treaty (UNASUR 2008)). At present, UNASUR costs are predominantly administrative. However, over time, its budget is expected to serve as a resource for a number of scale sectoral programs.

Bank of the South should be a major financial instrument for stimulating economic development (infrastructure development, research and innovation, etc.). It was founded in 2009 by the member-states of UNASUR.

The Central American Integration System (Spanish: SICA) sets quite ambitious integration goals (in the long run – the creation of an economic and political union). However, today this international organization can only be called a customs union. The SICA central authorities have a single budget. Administrative and technical functions for the implementation of the budget are the responsibility of the General Secretariat.

The SICA budget is funded by equal contributions from member-states according to the Tegucigalpa Protocol (see article 32 of the Tegucigalpa Protocol of the Charter of the Organization of the Central American States (SICA 1991)). Program expenditures are funded by contributions differentiated with respect to each member's involvement in the corresponding program.

There are also several international unions that can claim to have created a Common Market of a relatively mature form. All these unions are financially independent, which is conditioned by the availability of separate budgets at their disposal. The first of these is the European Free Trade Association (EFTA). The EFTA policies determine the structure of the organization's budget expenditures. Thus, in 2017, out of 21.869 million Swiss francs of budget resources, 11.486 million were planned to develop cooperation with the EU, including within the framework of the European Economic Area (EEA), 5.037 million were directed to enhance trade with other countries of the world and 5.346 million covered internal needs, including administrative costs (EFTA 2019).

Contributions from the member-states to the general budget are calculated in proportion to each country's share in the total GDP of the EFTA members. As a significant part of the EFTA's spending is related to the EEA, Switzerland (the only member who is not a party in the EEA) receives a discount on its contribution. If a member-state is in arrears with the payment, interest on arrears of 10 % per annum shall be charged, payable by the member-state together with the next contribution to the association's budget (Boiar, 2014).

The East African Community (EAC) was founded in 2000 and by 2010 a customs union and a common market have been launched within its framework. The activities of the EAC bodies and institutions are funded from a single supranational budget. Financial rules and regulations are the legislative prerogative of the EAC Council. The Audit Commission performs an independent external audit of the Community accounts (see chapter 28 of the East African Community Treaty (EAC 1999)).

The annual EAC budget is funded by equal contributions by the partner-states and receipts from regional and international donations and any other sources as may be determined by the Council. The EAC self-accounting institutions can operate in accordance with their own financial provisions (see article 132 of the East African Community Treaty (EAC 1999)).

Six countries of GAFTA managed to deepen their integration to the level of a common market and in 1981 they founded a separate regional union called the Gulf Cooperation Council (GCC). GCC activities are financed from the common budget, which is managed by the General Secretariat of the organization. The budget is approved annually by the Supreme Council. GCC expenditures are predominantly administrative and funded by

member-states equally (see article 18 of the Charter of the Cooperation Council for the Arab States of the Gulf (GCC 1981)).

The free movement of goods, services and factors of production was ensured by 12 member-states of the Caribbean Community (CARICOM). Despite the varying degrees of involvement of member-states in the process of integration within CARICOM, the organization has its own supranational budget. It is funded by contributions from all participants taking into account their economic capacity (GDP). The size of the common budget is insignificant as the expenditures are primarily administrative and not redistributive. The financial penalties are foreseen if some member-states fail to meet their budgetary commitments (see article 27 of the Revised Treaty of Chaguaramas Establishing the Caribbean Community Including the CARICOM Single Market and Economy (CARICOM 2001)).

There are also three international unions who managed to create a monetary union as a partial form of an economic union. The Organization of Eastern Caribbean States (OECS) is one of them. It has a single budget which covers both administrative costs and the program-related expenditures. The two main revenue sources for the OECS budget are the national contributions and donor aid. The latter revenue source plays very important role for the OECS (see Boiar 2014).

Financial provisions of the primary legislation of the OECS do not allow for budget imbalances and provide for the possibility of approving special budgets of the organization aimed at covering non-typical costs (see article 17 of the Treaty of Basseterre Establishing the Organisation of Eastern Caribbean States Economic Union (OECS 2010)).

The budget of the West African Economic and Monetary Union (WAEMU) is adopted by the WAEMU Council after submission by the Commission. Some temporary compensatory budgetary mechanisms can be introduced in favor of the member-states undergoing significant losses because of the harmonization of the customs and tax regulations (see articles 47, 53 and 58 of the Treaty of West African Economic and Monetary Union (WAEMU 1994)). Some WAEMU structures have their own budgets and financial autonomy. The Central Bank of West African States (BCEAO) is one of them.

The WAEMU budget is financed by own resources called the Community Solidarity Levy. It is constituted by the part of the common customs tariff and indirect taxes received by member-states. In 2013 WAEMU allocated 64.6 % of budget resources to administrative expenditures of the Union's institutions, 27.8 % – to finance the projects of the Regional Integration Support Fund (FAIR) and the rest – to cover needs of the Regional Fund for Agricultural Development (FRDA) (WAEMU 2019).

Unique in the practice of supranational budgeting is the principle of financial solidarity introduced in WAEMU. It states that, when discussing budgetary issues, member-states cannot be guided by the argument of equivalence between the amount of funds they bring to the common budget and the benefits they receive from membership in the Union (see article 49 of the Treaty of West African Economic and Monetary Union (WAEMU 1994)).

There is another Monetary Union in Africa – the Central African Economic and Monetary Community (CEMAC). The CEMAC's supranational budget system is very similar to the WAEMU's one. Prior to the fiscal year the CEMAC Council approves the annual budget of the organization which includes the budgets of the CEMAC governing institutions and the bodies established by them. This, however, does not mean that all budgets are approved at the same time as a single legal act. For instance, the budgets for 2012 were approved by at least three legal acts. The first of them recorded the estimates of the CEMAC Council and Commission and the cost of the CEMAC Football Championship, the second one recorded the budget of the Community Development Fund (FODEC) and the third one – the budgets of the Parliament, the Court and a number of

specialized agencies (CEMAC 2011). The FODEC resources are used in two ways: the compensations to member-states who suffer losses resulted by the creation of customs and monetary union and the financing of integration projects (CEMAC 2000).

Except for the solidarity principle, the revenue-generating mechanisms in CEMAC are very much similar to those of WAEMU (Boiar 2014). For non-fulfillment of their financial obligations' penalties can be imposed against member-states. The budget of the organization must be in balance.

The European Union is the only international union that has introduced all the intermediate forms of economic integration (including the economic union). Moreover, the EU stands today on the brink of full economic integration. Its budget system is the most sophisticated, functional and complex. In many international unions it is used as a model supranational budget system.

The size of the EU budget is the largest among all the existing unions both in relative and absolute terms. In payment appropriations it totals up to 145 billion euros in 2018 and is over 1 % of the EU GNI (European Commission, 2019). The mechanisms of supranational revenue-generation and expenditure allocation in the EU are rather complicated.

98 % of the revenues are comprised of 'own resources' that consist of three categories: GNI and VAT-based contributions from national budgets of member-states and 80 % of customs duties on imports from outside the EU. The rest 2 % are added by other sources of revenue. There are some specific rules and compensatory mechanisms established for individual member-states within the system of the EU own resources (correction for Great Britain, own resource general ceiling as percentage to GNI, discounts in budgetary contributions for Netherlands, Austria and some other states, etc.).

The EU expenditure is structured according to the objectives and political priorities of the Union. Only up to 7 % of annual budgets go to administration. Regional (cohesion) and agricultural policies hold the largest shares in the annual budgets (around 35 and 30 % correspondingly). However, almost all sectors of societal life are covered by the EU financed programs (except for defense, direct taxes and some social sectors). The fiscal intervention in the EU respects to large degree the postulates of the theories of fiscal federalism and public sector economics (see Boiar 2018) and the expenditure is allocated following the principles of conferral, subsidiarity and proportionality (see Article 5 of the Treaty on European Union (EU 2008)).

3 Principles of budgeting in international unions

The empirical analysis carried out in this paper gives grounds for arguing that there is a direct relationship between the scope of power of supranational union authorities and the volume of resources concentrated in the union budget. In particular significant budgets are inherent in more mature unions whose governing bodies have wide powers.

The size of an international union budget can have a significant impact on the progress of supranational budget process. If there are objective reasons that lead to the growth of the budget size, the politicization of the budget process usually increases (budgetary negotiations become more sophisticated, member-states tend to use the net balance approach in assessing their benefits from participation in the union). For its part, an increase in the politicization of the budget process may lead to destabilization of the budget system and the international union as a whole. One of the ways to mitigate such a situation may be introducing mechanisms for limiting the growth of budgetary revenues (expenditures) or adopting other innovations aimed at increasing the acceptability of the financing system of the international union's activities by all its members.

On the other hand, the small financial needs of an international union create a situation where member-states do not show the

principle approving the budget-financial mechanisms of the organization, especially regarding the structure and rules of formation of the revenue part of the budget. However, as the integration deepens and the need to increase the union's budget appears correspondingly some difficulties in reforming the budget system of the union may occur as some members who are in winning situation from current budgetary setup will block the reform decisions.

It is also noticed that if there are significant differences between the member-states in the levels of economic development, it is difficult for them to reach a mutual agreement on the structure of revenue and expenditure parts of the common budget (Viner 1950, p. 78).

In addition to these general observations, we can single out a few principles that, if followed, would create preconditions for the effective functioning of a supranational budget system. Firstly, it is the principle of subordination of the budget system to the goals of a particular international union. The goals, for its part, should be clearly formulated in the union founding treaties based on economic reasonability and political will of the member-states. Politicization of the budget process may lead to significant deviations in the structure of budget expenditure of the union from the declared goals (this is partly observed even in the EU).

Similarly, politicization of the integration process may lead to the emergence of a gap between the scientific theory (primarily the theory of fiscal federalism and the theory the public sector economics) and the goals of an international union. From the point of these theories both sectoral and horizontal policies should be financed from supranational level if this creates better opportunities to internalize externalities and economies of scale, maintains the minimum scale of necessary financing or helps to eliminate negative effects of policies attributed to the powers of the central bodies of the union. If not – the efficiency (in terms of the cost/benefit ratio) of the fiscal policy of the union will suffer.

In case when distribution of powers between national and supranational levels of authority doesn't respect the scientific theory the principle of subsidiarity should be followed. From budget-financial point of view this principle manifests itself in the delegation of responsibility for the particular policy fiscal regulation to that level of authority where it yields the best effect.

Scientifically grounded should be not only the goals and objectives of an international union, but also the structure of its revenues and expenditures. Therefore, scientific validity can be considered as the principle of a supranational budget process not only in the context of the first principle, but also separately.

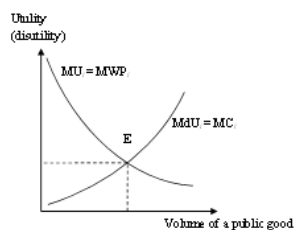
Hence, the second principle of supranational budgeting should be the principle of scientific validity. Theories and methods applicable for the supranational budget simulation are discussed and systemized in Boiar et al. (2018). Here we would like to develop some thoughts as for how the optimal ratio between taxes and expenditures could be established in an international union. As a start point, we use the Principle of Maximum Social Advantage described by H. Dalton in 1923. In his work the scholar considers budget expenditure as a means of creating a public good, and taxes – as a cost (fee) of society for this good.

The main idea behind the Dalton's principle is that the provision of the public good by the government should be carried out (and paid by society in the form of taxes) as long as the marginal utility of this good (which, according to the rule of decreasing returns, decreases with the increase in the volume of the provided good and is graphically a down sloping curve) becomes equal to the marginal disutility with the payment of taxes by society (which, on its part, increases as taxes grow and is an upsloping curve). An optimal solution for society is the point of intersection of the two curves.

In practice the value of utility (and, moreover, marginal utility) from the provision of public goods (as a result of implementation of policies) and disutility from the payment of taxes in most cases are difficult to determine. However, with respect to an international union this task does not seem unrealistic if we make some assumptions. First, let us assume that the marginal utility that each member-state of an international union receives from its participation in this union (MU_i) is equal to the marginal willingness-to-pay to the common budget of the respective member-state (MWP_i). The reason for this is the rather justified assumption that the integration utility is the main determinant of the willingness-to-pay and between them (and, accordingly, between the marginal utility and the marginal willingness-to-pay) there is a direct proportional dependence (see Boiar 2015).

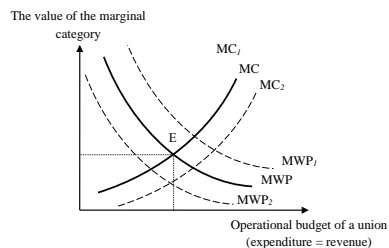
Similarly, it can be assumed that the member's contribution to the common budget is the sole or main source of dissatisfaction associated with the provision of a certain set of public goods from the supranational level, and the relationship between that dissatisfaction and the amount of the funds paid to the budget is directly proportional. Then the marginal disutility of this member-state (MdU_i) can be equated to its marginal contribution (MC_i) to the union budget. Since both the marginal willingness-to-pay and the marginal contribution to the budget can be expressed in monetary terms (that is, to be comparable), a set of data on them can be used to establish the optimal ratio (E point) between the amount of contributions paid by each of the member-states to the common budget and the amounts these countries receive of its funds (figure 1).

Figure 1. Adaptation of the Dalton's principle to the budget of an international union



The arithmetic mean value of the marginal willingness-to-pay and the marginal contributions to the common budget of all member-states will enable to establish the optimal, in terms of maximizing public welfare (utility), size of the supranational budget that should be directed towards the provision of the existing "range" of public goods from supranational level (figure 2).

Figure 2. Combinatorial model for optimizing the size of the budget parameter of an international union



With the change in the political priorities of an international union or other factors that determine the integration utility received by the member-states, the position and form (curvature) of the marginal willingness-to-pay line (MWP) will change. The structural characteristics of the budget revenues of an international union have a decisive influence on the position and form of the marginal contribution curve (MC).

The only obstacle that may arise when applying this methodology for optimizing the relationship between the budgetary revenue and expenditure in a particular international union is the lack of data on the member-states' willingness-to-pay³. However, with the establishment of the appropriate data collection mechanisms (for example, through the introduction of an additional question in annual surveys conducted in the member-states of a union⁴) these difficulties can be resolved.

It is also proposed to calculate the member-states' contributions to the union's budget proportionally to their willingness-to-pay (Boiar 2015). Combination of this approach with the adapted Dalton's principle would help to overcome a number of problems that exist within international unions, in particular within the EU, namely:

- to ensure the fairness of the supranational fiscal redistribution system;
- to maximize the economic efficiency of the system (if postulates of the theories of fiscal federalism, public sector economics and some others are followed as well);
- to ensure financial and political stability of the union;
- to remove from the agenda the issue of compensations to the member-states with a significant negative net balance in the union's budget.

From the point of view of efficiency, it is also advisable to reconsider the budgetary principle of unity that is applied in some international unions, in particular, in the EU. Financing each public good provided from supranational level via separate systems of the union members' contributions would allow following the Dalton's principle and keep the optimal balance of financing (see Figure 1). In the EU the policy groups could be singled out according to the categories (subcategories) of multiannual financial framework: single market and innovation; cohesion; natural resources (agriculture); environment protection; migration and border management; security and defense and external activities (European Commission 2018).

The third principle of an efficient supranational budgetary process is the principle of minimizing the dependence of the international union budget system on the internal and external political factors. First of all, it concerns the formation of the budgetary revenues as they provide the financial stability of the union. The experience of some organizations (EU, CEMAC, COMESA, SACU, etc.) demonstrates that it is possible to diminish the domestic political factor by introducing financial regulations enabling the union to generate its own resources without any additional decisions by its member-states.

In this context, it is important to make sure that the union member-states do not use their budgetary net-balance situation (a difference between the contribution to the common budget and appropriations received from it) as an argument in supranational budgetary decision-making process. Some current unions try to resolve this problem by introducing a legal ban on the use of such arguments (WAEMU) or by making rebates in favor of the states with significant negative net balance (EU). In our opinion both methods do not solve the problem. The first one prohibits expressing the motive rather than being driven by it, and the second one can be assessed only as an attempt to take the problem under control.

Another way to deal with the net-balance argumentation problem is to set the amounts of the member-states' budgetary contributions in proportion to their willingness-to-pay, which, for its part, as a category displays all the positive and negative effects (economic, social, ecological, security and others, not only the difference between direct budgetary contributions and appropriations) received by states from their participation in a particular integration project (see Boiar 2015).

³ And, accordingly, their marginal willingness-to-pay, which is nothing more but the increase (decrease) of total willingness-to-pay with a per-unit change of public good (as expressed in budgetary expenditure) provided from supranational level.

⁴ Our suggestion for the question would be like this: "Citizens and companies annually pay taxes to the state. What share of these taxes would you agree to direct to secure the activities of the international union in its current configuration?"

Equally important for stable functioning of a union is the reduction of foreign political dependence. It usually manifests itself in the fact that a large share of the union's budget revenues originates from outside the union (the donations or aid from other countries or international organizations, etc.). In some of the existing unions (SADC, WAEMU, etc.) this has become a serious problem.

The departure from this principle may lead to the failure of some member-states to fulfill their financial obligations to the supranational budget, under-funding of the declared programs and projects, the inadequacy between financial needs and capabilities, and a significant budget deficit.

The fourth principle is the principle (principles) of fairness, transparency and simplicity of the rules and procedures of generation and distribution of budgetary resources of an international union. Fairness is usually interpreted as a non-discriminatory treatment of all member-states and equal consideration of their national interests.

In a democracy the "rules of the game" in the field of public finance (albeit supranational) should be clear (fully documented by law), universal (common to all), transparent and at the same time rather simple for understanding by the general public. Significant deviations from these principles may lead to misunderstanding and/or disregard by the public (the taxpayer) of budgetary procedures and the supranational budget system. Ultimately, this lack of public support will jeopardize the integrity of the international union itself.

The fifth principle is the principle of complementarity. It means that if there are any supranational budget expenditures aimed at internal redistribution of factors of production, they should complement and not replace the relevant fiscal interventions of the member-states. Otherwise, the direct managers of the funds will have lack of motivation for their effective utilization and the common good problem will sharpen.

The sixth is the principle of proportionality. It should ensure the adequacy of supranational fiscal interventions to the objectives of an international union and to the capabilities of the beneficiaries to utilize the funds. Underfinancing of certain programs or projects may result in failure to achieve the desired results or their mismatch with the costs incurred as there were no sufficient funds to implement the final measures that determine the success of the whole project.

On the other hand, excessive funding can stimulate extravagance and financial fraud and can lead to inefficient use of funds due to the inability (technical, infrastructural, qualificational, etc.) of their immediate recipients to organize and ensure the required level of implementation of all necessary measures.

4 Conclusion

The experience of the existing international unions demonstrates that financial capability is one of the main preconditions for successful realization of any international integration project. There are general basic budgetary principles to be followed if the creation of a functional and effective international union is on agenda. They are a symbiotic combination of both the provisions of a number of scientific economic theories and the empirical evidence of the existing international unions (primarily the EU) and federal states.

According to these principles a supranational budget system should be subordinate to the goals of the international union in question, scientifically valid, independent of external and internal political factors, fair, transparent and simple. The efficiency of supranational fiscal policy can be maximized if the size and the structure of the union's budget (both revenue and expenditure) are determined in accordance with such scientific theories as the theory of fiscal federalism and the theories of public sector economics. Additionally, supranational appropriations should usually be complementary to the relevant

national and/or subnational expenditure and be adequate (proportional) to the needs and capabilities of the beneficiaries.

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Primary Paper Section: A

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THE LINGUISTIC LANDSCAPE OF BANSKÁ BYSTRICA

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Abstract: This paper focuses on the quantitative and qualitative systematic analysis of the multimodal semiosphere pertaining to the linguistic landscape of the selected urban spaces in Banská Bystrica. It examines public urban communication in the form of text-based public signs (road signs, billboards, street names, place names, commercial shop signs, public signs, etc.) as information units to which passers-by are exposed. This paper explores both local features and commonalities that may show the patterns of globalisation, as well as general areal and historical patterns.

Keywords: Banská Bystrica, Linguistic Landscape, multilingualism, languages, multimodal semiosphere, sign

1 Introduction

This paper is a partial research output of the project “Language in the City – Documenting the Multimodal Semiosphere of Linguistic Landscapes in Slovakia and in Comparative Perspective” (2019 – 2023), which focuses on documentation and analysis of the selected intra-urban locations, namely, the city of Banská Bystrica as the Central Slovakia midpoint. The project aims at quantitative and qualitative documentation and systematic analysis of multimodal semiospheres of the linguistic landscapes pertaining to the selected intra-urban locations in Slovakia (Bratislava, Banská Bystrica, Banská Štiavnica, Komárno) and their comparison with two locations in Germany (Munich, Erlangen) and two in Hungary (Komárom, Békéscsaba). Therefore, this project studies public urban communication, treating public signs created by inscription or linguistic means (road signs, billboards, street names, place names, commercial shop signs, government buildings, etc.) as information units, which can be considered public texts and to which passers-by are exposed.¹ The project is interdisciplinary in nature; it draws from general research paradigms in cultural linguistics, sociolinguistics, multimodal linguistics, and cultural semiotics as well as other ongoing research projects related to the study of linguistic landscapes.

This paper presents partial results of the qualitative analysis of the selected intra-urban location in Banská Bystrica in terms of its characteristics and specificities, with a focus on their multilingual aspects.

2 Banská Bystrica linguistic landscape research methodology

Linguistic Landscape (Ger. *sprachliche Landschaft* / *Sprachlandschaft*) has emerged as a research area in the field of sociolinguistics at the end of the 20th century, when the written form of language in the public spaces began attracting scholarly attention. Although the first probes into this subject matter can be traced back to the 1970s, it has been conceptualised later by Landry and Bourhis (1997). Their definition of linguistic landscape laid the foundation for all the following research into this subject matter (Jurčáková – Štefaňáková, 2021, p. 18). Landry and Bourhis (1997) define linguistic landscape as „*the language of public road signs, advertising billboards, street names, places names, commercial shop signs, and public sign on signs on government buildings combines to form the linguistic landscape of a given territory, region, or urban agglomeration*” (p. 25).

The linguistic landscape is a key concept in this interdisciplinary study; it represents a language component and embodies its social interaction. Linguistic landscape is a dynamic entity

created by institutions or individuals; yet, on the other hand, the linguistic landscape influences the people who occur within it and perceive its space (Krško, 2021, p. 62). The authors of language means used in the so called “commercial shop name signs,” i.e. written signs labelling shops, facilities, and companies interact with recipients who occur in the given location randomly or purposefully.

Originally, the term linguistic landscape used to refer specifically to the texts found on the signs placed in the exterior. Today, the texts appearing inside public buildings as well as on smaller objects are also considered relevant, e.g. restaurant menu, banknotes, postcards, business cards. Linguistic landscape involves any written signs placed in the external or internal premises of public institutions, private shops, or companies in the given geographic location (Jurčáková – Štefaňáková, 2021, p. 19). To sum up, linguistic landscape research deals with written language in public spaces from different perspectives.

For the purpose of this APVV project, linguistic landscape has been defined as a set of public signs with inscriptions such as road signs, billboards, street names, shop names etc. The data is analysed from a quantitative point of view, covering approximately 25,000 geographic units. These units (and close-ups of the elements composing these units) are annotated in the database system with respect to a wide range of parameters relevant to the study of the linguistic landscape, such as the predominant types of speakers in a given inner-city area, the language (languages) encountered and degree of multilingualism, font, sign type and size, etc., including also other characteristics such as functional aspects (e.g. language economy) or types of buildings (architecture). Another natural area of comparison is foreignness, or the use of a given language in another country. Xenolinguistic research involves a comparison of the visual database pertaining to the selected city (Banská Bystrica) with other cities in Slovakia, Germany, and Hungary (Istók – Lörinzc – Tóth, 2021, p. 33). Qualitative analysis therefore deals with the interpretation of the statistical and topographic findings, i.e. semantics, language legislation, tourism, etc.

In terms of research methodology, this paper focuses specifically on the following characteristics: linguistic landscape as public urban communication; linguistic landscape as a body of public texts perceived by the passers-by; linguistic landscape as a representation of the semiotic world with a high multimodality level (Dobřík, 2021, p. 33). The basic hypothesis can be formulated as follows: a specific intra-urban linguistic landscape represents a semiotic world (semiotic sphere) characterised by a high multimodality level and comprising both the traditional and creative aspects of public communication.

Partial research results have already been presented at a number of conferences and published in the following proceedings: *Od textu k prekladu XIV*, Part 2, Linguistic Landscape (2020), (ed. A. Ďuricová) and *Od textu k prekladu XV*, Part 2, Linguistic Landscape (2021), (eds. A. Ďuricová/J. Lauková).

An intra-urban public space in the Banská Bystrica city centre was selected for the purpose of partial empirical research presented in this paper. As the regional centre and seat of the self-governing region (Banskobystrický kraj, cf. Map 1), i.e. the administrative centre of the entire region, Banská Bystrica (roughly 80,000 inhabitants) provides the infrastructure (hospital, schools, universities, administration etc.) and services (shopping, restaurants etc.) not only for the local inhabitants, but also for the surrounding towns and villages.

¹ Cited from the APVV project documentation, Part 1.1 Basic goals and hypotheses.



Map 1. The location of Banská Bystrica in Slovakia

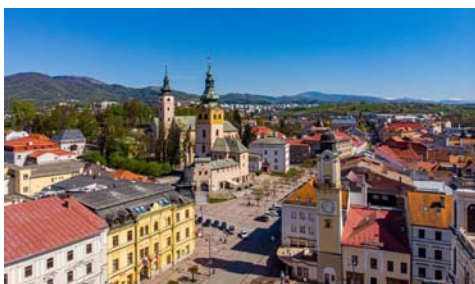
Figure 1. Banská Bystrica²

Figure 2. Banská Bystrica (centre)

Identifying a specific area within the sub-study was the first step of this research. The study area includes all streets and their segments within the selected location. The streets analysed in this paper (Štefan Moyses Square, Horná Street) are located in the very centre of the Banská Bystrica city, which increases their tourist appeal. Horná Street connects to the SNP (Slovak National Uprising) square as well as the following streets: Skutecký, Komenský, Kukučín, Železničiarska, Československá armáda, and Partizánska cesta. Štefan Moyses Square is located almost in the centre of Banská Bystrica. It is named after Štefan Moyses, Slovak church official and vice president of Matica Slovenská, a major cultural institution in Slovak nation-building. Štefan Moyses Square is one of the most visited parts of the city, along with the Slovak National Uprising square. This location also comprises a marketplace (referred to as “stará tržnica by many, especially native Banská Bystrica inhabitants).



Figure 3. Štefan Moyses Square (map)



Figure 4. Štefan Moyses Square (satellite image)



Figure 5. Horná Street (map)

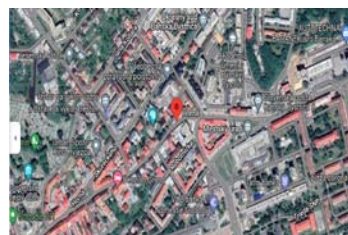


Figure 6. Horná Street (satellite image)

During the initial phase of this research, the selected intra-urban location was delineated on the map. Google Earth and Google Maps applications were used for this purpose. In the next step, the register for documenting the route length was created. This length then had to be calculated for each side of the street. Within this project, the required data collection area for partial research studies is a total of 4 km. The second step was data collection. This was done through photo documentation (with a mobile phone camera). For example, the photographic documentation of Štefan Moyses Square and its individual sequences comprises approx. 200 large-scale photographic units (building facades). Some of these were taken before the pandemic in November 2019, while the others were made during the pandemic in July 2020.

On Horná Street, about 186 large-area objects were documented, some of them repeatedly, as the location had been part of the preliminary research before the APVV project was submitted in 2018. This “double” documentation serves to explore dynamic changes in the linguistic landscape. Photographs of large-scale units (“aggregates” in the project terminology) were further edited into individual signs.

A prerequisite for the study of linguistic landscape signs requires documentation of the respective intra-urban space, as well as sorting and labelling of the photographic material. The goal of this partial research was to collect information and data as the basis for further statistical processing and a more detailed qualitative analysis of the linguistic landscape could.³ The basic

² All photographs presented in this paper are part of the database pertaining to the aforementioned APVV research project.

³ Compare Jurčáková – Štefaňáková, 2021, p. 19

unit in linguistic landscape research is *the sign*. The examples collected in the Banská Bystrica city centre will be used to explain, analyse, and interpret the basic unit of the emerging new interdisciplinary subfield of linguistic landscape linguistics. However, linguistic landscape research is not limited to the study of linguistic signs; it also focuses on signs as such. A sign can take the form of a grapheme, a logo or logonym, a word (toponym, urbanonym, chrematonym, etc.), a phrase, a syntagm, a text, an image, a road sign, etc. (Jesenská, 2021, p. 45).

The definition of a sign is rather broad. Specialised literature often refers to Backhaus' definition (2007, p. 66) of a sign, which stated: "any piece of written text within a spatially definable frame." However, this definition is rather vague and does not frame the size of the basic unit. A piece of data can consist of several signs or posters placed on a large shared space (shop window, advertising column). For the purpose of this project, a single poster, plate, or sticker is considered a sign. Co-occurrence of several signs in a shared context or space is called a cluster⁴.

Linguistic landscape research distinguishes the following types of signs:

- 1) *Public signs* (alternatively called top-down signs). This group comprises all signs pertaining to institutions. In general, top-down signs are installed by official authorities and institutions. This includes the signs placed on and in state-owned buildings, schools, nurseries, hospitals, as well as street signs, public transport signs, such as schedules, bus stop signs, etc. Even signs on public transport vehicles such as buses (e.g. final destination, direction) are considered public signs.
- 2) *Private signs* (alternatively called bottom-up signs). This group comprises the signs created and placed by individual people and businesses. It includes the signs on and in shops, posters on signposts, lamp posts, etc., and even graffiti. Some of them are considered transgressive as they are placed on objects without permission.

Bottom-up signs can be created both by individuals and legal entities. This group of linguistic landscape signs includes, for example, shop signs, fixed or mobile signs offering goods and services, advertising posters and billboards, and graffiti (Rosenbaum et al., 1977).

The aforementioned categorisation is sometimes disputed, because laws of language can affect the design of a sign. Moreover, under certain circumstances, a private sign can also be considered a public sign if its form and content are determined by legislation, such as the obligation or prohibition related to using certain language, specific signs, colour, or their combination⁵.



Figure 7. Street sign – Štefan Moyses Square (top-down sign)

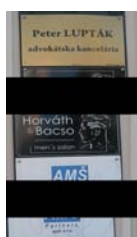


Figure 8. Fixed signs – Štefan Moyses Square (bottom-up sign)

⁴ Cited from Projektleitfaden – Project Guidelines, Phase 1: 1/7–31/2/2019 (author: Dr. Iлона Schulze).

⁵ Cited from Projektleitfaden – Project Guidelines, Phase 1: 1/7–31/2/2019 (author: Dr. Iлона Schulze).

In addition to the producer of the sign, multilingualism (or its lack thereof) is also an important criterion in this research (compare Molnárová – Lauková, 2022). Multilingualism has become more pronounced and frequently discussed since Slovakia joined the European Union. It can be considered one of the basic features of the contemporary globalised world (compare Michelčíková, 2013). The EU understands the concept of multilingualism dichotomously:

- Multilingualism is *a person's ability to use multiple foreign languages*.
- The term multilingualism also refers to the *co-existence of different languages in a shared geographic space* (in this case, the EU).

This study focuses on multilingualism in individual signs, e.g. for example in the names of shops and establishments. Depending on the content of the information conveyed by the different languages represented on a single sign, we distinguish four types of signs based on the classification of Reh (2004, pp. 8–15).

Reh (2004) classified multilingual texts as follows.

- a) Repeating multilingualism: – the sign offers identical information in two or more languages.

E.g., Abfahrt – Departure

- b) Fragmentary multilingualism: the information presented in the foreign language is partial, i.e. only fragments of the sign have been translated into a foreign language.

The part of the sign presented in a foreign language is incomplete in comparison to the part presented in the source language. E.g. German: Zugverbindung: *Nürnberg-München* via Ingolstadt/English: *Nuremburg-Munich* (in the latter case, the information that the train travels through Ingolstadt is missing).

- c) Overlapping multilingualism: part of the information mediated by the sign is identical in all languages, while another part of it varies.

The entire text can only be understood with a certain degree of knowledge of all the languages used. Some bits of information overlap, i.e. they are present in all the languages, while other information is missing in some languages.

- d) Complementary multilingualism: a sign bears complementary information in different languages, e.g. a Slovak text using English words (Gašová, 2020, p. 71).



Figure 9. An example of fragmentary multilingualism in a sign

To sum up, multilingualism is one of the factors shaping the linguistic landscape. Moreover, it is closely connected with vocabulary internationalisation resulting from the intense multilateral language contacts. The linguistic perspective provides information on the number of languages present in the area under study as well as information about the types of script used. It allows for the evaluation of lemmas from the viewpoint of grammatical word classes and their semantic and stylistic characteristics. The text placed on a single sign is perceived as a whole and evaluated in terms of multilingualism (Gašová, 2021, p. 25).

3 On certain specificities of the Banská Bystrica city centre linguistic landscape (Horná Street and Štefan Moyses Square)

According to the linguistic landscape research methodology, the analysis of the selected intra-urban location in the synchronic

aspect shows a clear prevalence of bottom-up (unofficial) signs. Some of them utilise other languages besides Slovak. In top-down signs, Slovak prevails, which is in line with the Law of 1995 on the State Language of the Slovak Republic. It can be concluded therefore that the state and public institutions located in the investigated location comply with this Law (Jurčáková – Štefaňáková, 2021, p. 18).

Partial linguistic landscape research led to a number of interesting findings related to multilingualism. The qualitative analysis showed that nine languages (including Slovak) were used in the signs.



Figure 10. Fotky pre radosť [Photos for Joy] – a monolingual Slovak sign

Foreign languages occurring in the signs analysed included English, French, Italian, German, Spanish, Russian, Ukrainian, and Vietnamese. However, English clearly prevailed. The signs using English were bilingual as well as monolingual, i.e. English was combined with Slovak or used as the only language of the sign.

The prevalence of English in the analysed linguistic landscape is not surprising, as English names of shops, casinos, or restaurants have already become a common occurrence in the linguistic landscape (compare Schulze, 2019). However, the use of English is usually limited to shop, brand, or product names, while the rest of the relevant information is presented in Slovak (Lauková – Molnárová, 2020, p. 103).

The *Kooperativa a. s. Vienna Insurance Group* sign can be used as an example. It is the exact name of an Austrian insurance company with branches in Central and Eastern Europe, and this sign is placed above the entrance.



Figure 11. Kooperativa Vienna Insurance Group

Another example of an English sign is *GoodZone hookah & bar*.



Figure 12. GoodZone hookah & bar

However, there were also signs consisting of more than three languages. One of them, for example, is the fashion clothing shop *Boutique Natali, Moda Italy* in Štefan Moyses Square.

Its shop window presents in five different languages: Slovak (*dámska kolekcia*), English (*Moda Italy; fashion clothes*), French (*boutique*), Russian (*модная одежда*), and Spanish (*Ropa de moda*). Since Russian can be rarely found in the investigated area, the question arose why this language appeared in a shop advertising itself as an Italian fashion boutique. A personal interview with the shop owner clarified that she used a Russian sign because she was Ukrainian and spoke Russian (Molnárová – Lauková, 2022, p. 265).



Figure 13. Boutique Natali

The survey has also shown that Italian is the language most frequently used in the names of eating places such as cafés (could be also French) and restaurants, e.g. pizzeria, café, etc. The use of Italian can be interpreted as a cultural and language stereotype referring to international culinary phenomena like pizza, pasta, and coffee (compare Lauková – Molnárová, 2020).



Figure 14. Da Luigi Pizza – example of a monolingual sign in Italian

The shop *Coccodrillo* (Eng. “crocodile”) is another example of a multilingual sign in Italian (name and logo) designating a Central European brand specialising in kids’ fashion.



Figure 15. Coccodrillo – example of a monolingual sign in Italian

As for the occurrence of German in Horná Street, it was found in two surnames (Schneider, Fischer) – in the names of a pharmacy and a travel agency respectively. Lupták explained that in the case of Fischer travel agency, the proper name was transferred from one onymic system to another: anthroponym → name of an object, company (2013).



Figure 15 Fischer – example of a monolingual sign in German

The kitchen studio bearing the Slovak sign “Kuchynské štúdio” also utilised German in the form of a subtitle “Küchen”, i.e. German for “kitchens”.



Figure 16. Kuchynské štúdio – example of a multilingual sign using German

The use of French in shop names may also indicate a clear line of stereotypical cultural and linguistic connotations. French was observed in the signs of shops selling fashion, clothing, and jewellery, such as “bijouterie” or “boutique”.



Figure 17. Mirage – casino



Figure 18. Bonjour Palacinky – Bagety – Káva [Bonjour Pancakes – Baguettes – Coffee]

The sequence of languages, i.e. which of them comes first, is also important. All these aspects are relevant for analysing the relationships between these languages in terms of their equality or dominance (compare Androutsopoulos, 2020).

In addition to the linguistic analysis, the study of signs also aims at the manifestations of multimediality and multimodality in intra-urban locations. Linguistic landscape research deals with the shape and type of script, its size, placement, and colour. Multilingual signs use different scripts for different languages. Their selection is often related to cultural traditions or stereotypes. The font size used to present information (e.g. on a shop sign) in different languages is also taken into consideration (Molnárová, 2021, p. 60).

For lack of space, these aspects cannot be accounted for in this study; however, they are part of the author's ongoing empirical research. Therefore, the presented partial interdisciplinary linguistic landscape research into the selected location of the Banská Bystrica city centre (Štefan square, Horná Street) focused on multilingualism, which expresses itself in the occurrence of multiple languages in shop names. This finding confirms intercultural intentions of the producers of signs.

The foreign languages in the shop signs that we observed in the investigated area are usually company names, brands, and

internationally known identifiers of shop and product types. On the other hand, more detailed information was presented in Slovak, e.g. assortment, names of goods, opening hours, etc. Nevertheless, the shop name remains the most important part of its sign regardless of the language used (compare Lauková – Monárová, 2020).

4 Conclusion

The presented study focused on the characteristics and specifics of the linguistic landscape in the selected intra-urban location, i.e. the Banská Bystrica city centre. The goal of this partial research was to map the selected area with the aim to lay a foundation for further partial research within an international APVV project. The selected location was analysed in the synchronic context, i.e. taking into account the dynamics of the linguistic landscape development with a focus on multilingualism and the characteristics of the signs constituting the intra-urban space of Štefan Moyses Square and Horná Street.

The comparative perspective of this linguistic landscape research revealed shared features e.g. simultaneous representation of identical communicative strategies selected by international companies, appropriation and globalisation of sign presentation, and language laws potentially leaving room for cultural misunderstanding.

The linguistic landscape of the selected Banská Bystrica downtown public space will be further explored using qualitative and quantitative methods.

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Primary Paper Section: A

Secondary Paper Section: AI

INDIVIDUALIZATION IN THE TEACHING OF WRITING

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The study is a partial output of the Kega project no. 0026UK-4/2021 Preventive strategies of specific learning disabilities in terms of graphomotor skills in preschool age.

Abstract: The study shows research findings that focus on identifying the individualization in the teaching of writing in the first grade of primary school. The research team consists of primary school teachers. The indicators reveal strategies to support writing of learners who face writing difficulties.

Keywords: writing, primary education, individualization in teaching, primary school teacher.

1 Introduction

Graphic expression is a natural part of a child's development, which is not only a sought-after activity and an opportunity to create something, but also a way of expression. Graphomotorics, which manifests itself in drawing and initial writing already in preschool age, is preparation for mastering the skill of writing in school. In preschool and early school education, the level of graphomotor skills is considered one of the predictors of the success of writing (and the related complex learning of the student), or on the contrary, it indicates the possible risks and difficulties that writing can bring to the student. The basic goal of language teaching is the acquisition of writing, as a basic tool of literacy, a means of understanding and expression (Belešová & Szentesiová, 2017).

2 The sequence of individualization in the development of graphomotor skills

Pedagogical diagnosis is a necessary professional activity for the teacher, based on he identifies the level of the student's development. A prerequisite for the development of graphomotor skills and support for writing is taking into account the regularities of psychological and physical development in the pre-school period and the beginning of younger school age, in view of the findings of the student's diagnosis (Fasnerová, 2018). Diagnosing handwriting and the writing process by the teacher focuses on identifying and evaluating the level of graphomotor development, possible difficulties in writing.

Subsequently, the teacher has the opportunity to plan and organize the educational process in such a way that the progress of each learning individual is ensured. The sequence of implementation of individualized graphomotor support can be based on a three-level approach (Berninger et al., 2006). A three-level approach not only to support writing, but also as part of the intervention for the student's difficulties in graphomotor expression begins with diagnosis and subsequent intervention. The first level of support focuses on performing a screening so that the teacher can determine the level of graphomotor skills of all students. In the second level of support, the teacher specifically develops deficit areas in children who, based on screening, have demonstrated a reduced level of graphomotor skills. The third level of support applies to children with significant problems, where the teacher's support is not enough, and a specific intervention provided by a professional employee, a special educator, or a psychologist is necessary. Chung & Patel (2015) recommend that in the case of diagnosing a student with learning difficulties (including writing difficulties) all information related to findings should be accepted, which include cumulative, normative, but also anecdotal and observed data from all persons who come to contact with the student. This means that the aspect of diagnosis in the form of an unofficial, non-standardized finding and assessment of the pupil's

difficulties, including in the field of graphomotor skills, which is processed by the teacher himself, is of particular importance in the process of supporting learning to write.

2.1 Writing support

Adequate assessment of the level of graphomotor skills plays an important role in the training of graphic shapes, but it also makes sense as a prevention of difficulties related to developmental learning disorders in the field of graphomotor expression. Grizzle & Simms (2009) emphasize that if support is provided as early as possible aimed at deficient areas of graphomotor skills, early intervention has significant significance for the student and is considered a valuable benefit. We consider the earliest possible diagnosis and subsequent individualized approach to be a fundamental factor in supporting a student with difficulties in graphomotor expression, which may not (but may) be related to a developmental learning disability. In addition to recognizing and identifying expressions with subsequent support, early support for students with difficulties in graphomotor skills is also linked to the acceptance of didactic principles, which the teacher should accept as a starting point when applying support techniques (Chung & Patel, 2015):

- individualize and differentiate the curriculum - start with an activity in which it is assumed that the student will be successful,
- make graphic recordings regularly and for a reasonable amount of time, do not overload the student,
- not to focus the curriculum on tasks that require only graphic recording, but also to create alternative recording options, such as covering patterns, recording in sand, modeling, cutting out, gluing graphic shapes,
- choose games using different materials, especially with a focus on developing areas that are weakened, for example visual and auditory perception, spatial orientation, right-left orientation, attention, fine motor skills, sensorimotor skills.

3 Methodology

The research intention linked to the issue of the solved grant was a natural outcome of the investigation, which in the presented study is related to the didactic aspects of individualization and differentiation applied within the subject Slovak language and literature, specifically in the teaching of elementary writing in the preparatory period, i.e., in the period when the students in the first year are preparing to write the written form of graphemes. The research objective was an effort to identify the aspects of teachers' actions in teaching writing and, in particular, the support of this process in the elementary year.

A qualitative research methodology with a corresponding design was preferred for processing the issue. The decision to carry out a qualitative study was related to the fact that we were investigating opinions and attitudes that could not be counted or expressed in percentage terms.

The subjects of the research were 14 primary education teachers who worked in the elementary year in a fully organized elementary school in the Bratislava, Trenčín and Košice regions. The collection of research data took place in the period September 2020 - February 2021.

The research method was an unstructured interview, where the goal of the research was important for us and the identified variables from the conducted research probes, which represented the supporting topics for the interview. For this reason, we asked the participants about the principles, procedures and techniques of developing graphomotor skills and supporting writing in the preparatory period. The area of interest was also directly related to identifying what the teacher emphasizes as important in targeted writing support, which is connected with the necessity of individual diagnosis, knowledge and application of specific

options for writing support, and possible intervention by the teacher. We asked the participants direct open questions regarding the prepared topics and then also regarding the specific situation that was created during the interview. To obtain the required answers in order to understand the aspects of teachers' actions, each interview had a different duration. Some participants freely followed up on the content of the topic in the interview and spontaneously talked about their own pedagogical and didactic experiences. We used an audio recorder to record the responses. Based on the digital recording, we then created a partial transcription. The transcript was the basis for further analysis. The research subjects were confronted with the transcripts of the interviews. We continuously analyzed the investigation of the issue and based on the induction of repeated didactic phenomena, after reaching saturation, we decided on the number of participants in the qualitative research.

We conceived the research objective in the form:

- Identify and interpret strategies for developing graphomotor skills and supporting the writing of students with different levels of graphomotor skills in the period of preparation for writing graphemes.

Considering the research objective, we defined the research question that formed the core of the research project:

- By which procedures and means does the teacher attribute didactic significance when developing graphomotor skills and supporting writing in the period of preparation for writing?

When processing the research material, in the first step, we analyzed the research data based on the transcript of all interviews through open coding, as an initial identification of structures that are directly related to the research questions. With open coding, we focused on searching, comparing, categorizing and conceptualizing the data by creating conceptual labels. Coding was the basic mechanism for transforming structured data into a professional context. Working with the text revealed several codes, which we gradually integrated into categories by dividing them into groups. The codes in the groups had to have identifiable relational ties and connections in the characteristics of the monitored issue.

When determining the names of the categories, we were based on the nature of the corresponding codes so that the name of the category was abstract and represented the essence of each assigned code. Induced categories (developing graphomotor skills, diagnosis, writing support, limits in writing support) and identified relationships between categories, which arose on the basis of a detailed and repeated analysis of the research data, made it possible to interpret the research findings.

4 Discussion

In the study, we do not present the interpretation of the individual induced categories and the relational links of the corresponding codes, but we approach concrete strategies for the individualization of writing support, which synthesize the research findings in the form of a research theory.

We present the research theory by linking subjective opinions in the confrontation of relevant professional sources and with examples of research data - specific actions and intentions in teaching writing of students based on the statements of research subjects. Based on the fact that it contains transparent samples of research data, the research theory declares the correctness of the processing of research data in case it was not described from a subjective point of view, but contains an interpretation of opinions, decisions, actions, but also certain intentions of the participants that were identified in the research material. Participants' statements are marked in the form: (P1, 100) so that it is possible to clearly identify the participant and his statement in specific parts of the processed transcript.

We have divided the induced strategies of individualization of writing support into two subcategories, while one group represents possibilities for the student's writing, in the sense of progress in writing, and the other group of strategies has the character of limiting factors of learning to write.

Strategy of individualization in material, time, organizational adjustment of teaching

Individualization should represent a progressive form of education, which is a way of differentiating teaching while maintaining class heterogeneity, but with realized internal, content and methodical differentiation that respects the individuality of each student (Průcha et al., 2013). We consider the aspect of time adjustment for students who need more time when writing graphic shapes, we also consider an extremely suitable way of respecting the individual characteristics of the student, which have an impact on the gradual elimination of the slow pace of writing. The modification of the learning task is not represented in the application of individualization in the writing of graphic shapes in a form that would clearly declare the principle of individualization.

Sample from research: *I approach students who have problems with writing individually. The smarter students, in order not to get bored and not disturb their classmates, have at their disposal the solution of various tasks, supplementary questions, and puzzles. In this way, I create space for myself when I can devote myself to weaker students. I do it in such a way that they finish what they missed and I don't have to modify their learning tasks. Many times it is enough if I give them more time to write down the graphic shapes. But sometimes I also meet students where extending the time to write down the correct form is not enough, in which case I make writing a little easier for them. It is not very possible, because everyone has to learn to write. (P9, 755)*

An important part of the teaching was the change of the activities and the position of the place where the individual activities were carried out, which we evaluate as extremely appropriate, because the concentration of attention is low in the student in the first year. The change in the organizational arrangement of students in the classroom is also related to the application of individualization in the teaching of writing. In addition to the most frequently implemented form of writing, which is sitting at a desk, we identified writing at the blackboard and on the floor, but also the implementation of group writing.

Sample from research: *I use various material means, especially trays with sand, modeling clay or ordinary laces. In this way, students learn to shape a graphic shape. They know that if they don't like the shape, they can repeat the activity several times and have no fear of failure. This procedure has worked well for me if the student has a problem with both writing down and memorizing the graphic shape. (P9, 765) Alternating between static and dynamic activities and creating space for relaxation is very important for pupils in the preparatory period. I do it in such a way that if the students write for a long time, I offer them plasticine or a construction kit. It is an excellent way to take care of mental hygiene and ensure subsequent concentration of attention. I also realize that both activities develop fine motor skills, but also other areas of graphomotor skills, which has a positive effect on writing. (P8, 750)*

Strategy of individualization of writing support implemented by a teaching assistant

Porozumenie individualizácie je participantom zrejme, no túto možnosť v základných školách nemajú zabezpečenú všetci žiaci, ktorí potrebujú podporu pri ťažkostiach v písaní. Prítomnosť asistenta učiteľa je chápaná v zmysle podpory začlenenia žiakov, ktorí potrebujú individuálny a individualizovaný prístup, ktorý im asistencia umožňuje (Kováčová, 2019).

Sample from research: *If the school is staffed, for each class it has a personal student assistant or teacher's assistant who is dedicated to such a student who has various problems, which is*

also the case with problematic writing. For example, the teacher's assistant in my class pays particular attention to the correct grip. She is therefore devoted to pupils who have a problem with holding a pencil. She does exercises and games with them, where the students mainly manipulate and shift small objects. (P2, 265)

Strategy of individualization in adjusting time, but with an increase in writing for the student

As a limiting strategy for the individualization of writing support, we evaluate the presence of procedures where the participant creates space for the student to finish writing the graphic form, but at the same time conditions it by giving the student more written tasks than those students who write graphic shapes faster. After entering the first year of elementary school, the continuous recording of graphic elements and then the first letters during the lesson should not exceed ten minutes (Babiaková, 2019). The form of writing support, which the participant considers to be the optimal way of individualized writing support based on the example presented, is not suitable for the student, because the mastery of recording the graphic shape by the student, who has a slower writing pace, will not be removed if he repeatedly writes the graphic shape in the notebook. The mentioned form of writing support can demotivate and overload the student. It is related to the unfinished ossification of the pupil's wrist bones during the period of entry into elementary school. Based on this, according to Doležalová (2010), the student should only carry out graphic activities that are not burdensome and do not last too long.

Sample from research: *I work individually with a student who has problems with writing. I have adapted learning materials and we use different worksheets and learning tasks. I leave him more time to practice graphic shapes and therefore he has more exercises to practice writing than pupils who have no problem with writing.* (P6, 615)

Strategy without individualization - support of writing with frontal activities

Uvedené vyjadrenia sme zaznamenali vo viacerých dátach subjektov výskumu, čo nás vedie k presvedčeniu, že učitelia dokážu identifikovať ťažkosti žiaka, no možnosť k individualizácii vo výučbe písania nedokážu realizovať. Na základe toho realizujú podporu písania frontálnymi činnosťami, ktoré individualizáciu úplne vylučujú.

Sample from research: *It is not in my power to devote myself to a pupil who is fast, but also to one who is slow. This is not possible in a class with many students. That's why I try to find a golden middle path so that every student can learn to write. I cannot approach students individually and differentiate activities, because I would not have time to do it. Therefore, I try to do such activities that contribute to the elimination of difficulties with all students.* (P7, 445)

Based on the approximation of the mentioned strategies, we tried to create an explanatory theory about how teachers implement individualization in the teaching of writing in the first year of elementary schools in Slovakia, which was created through a detailed and reverse content analysis of research data. The teacher's strategies with an emphasis on methodological procedures and didactic means, which are considered important in the support of writing, formed the basic framework of the conceptualization of induced teacher's strategies, which are carried out by teachers in the preparatory period of writing. Strategies as possibilities and limits in the teaching of writing, due to the application of an individualized approach to the student, have significant characteristic descriptions supplemented by samples of the participants' expressions.

At the end of the presented research theory, we would like to state that the established research goal: "Identify and interpret strategies for developing graphomotor skills and supporting the writing of pupils with different levels of

graphomotor skills in the period of preparation for writing graphemes" was achieved.

We will also support the fulfillment of the research goal by answering the research question:

- By which procedures and means does the teacher attribute didactic significance in the development of graphomotor skills and writing support in the period of preparation for writing?

When formulating the answer, we were based on the interpretation of research findings in the formulation of the identified phenomenon of developing graphomotor skills and writing support in the elementary grade, with the identification of frontally realized writing support, which has the character:

- repetitive rituals when practicing writing each graphic shape,
- repeated recording of learned graphic elements at the beginning of each lesson,
- motivated warm-ups of the fingers and the whole hand,
- compliance with the hygienic and technical requirements of writing.

The didactic significance of individualization and differentiation in the teaching of initial writing is applied by teachers less often than frontal support in the teaching of writing. An individualized approach in support of writing to a specific student was implemented by using one of the options for individualization, namely in the selection of different materials, aids, tools and the way of recording graphic shapes, the progress of the learning activity, adjusting the time of writing, or changing the organization of the environment.

5 Conclusion

The realized research and especially the research findings open up opportunity for us to further investigate the questioned issue. Even though the presented research findings are linked to a specific research set, they enable the creation of an image that reveals the possibilities, but also the limits of the teacher's professional activity in the individualization of student writing support.

Based on the statements of the research subjects and their professional involvement, it is clear that the research intention touches on a current topic, in which the awareness of the validity of developing graphomotor skills and writing support resonates in the targeted and as early as possible elimination of pupils' writing difficulties. Already in the preparatory period, when students record the elements of written letters in the form of various graphic shapes, we encounter the fact that some students have significant problems and the usual teaching strategies are not enough for them. Therefore, the teacher should not underestimate the problems in the student's preparation for writing and expect that the situation will improve without the support provided. The writing of graphic shapes is extremely important and specifically focused for the subsequent writing of graphemes. Wildová (2002) emphasizes that some teachers underestimate the importance of the preparation period, which is counterproductive for the student in terms of subsequent writing. If a student with difficulties in writing simple elements of letters represented by graphic shapes is not provided with adequate individualized support during preparation for writing graphemes, his chances for more challenging writing of graphemes, words, sentences and the associated overall learning are limited in advance.

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Primary Paper Section: A

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EDUCATION OF THE INCARCERATED IN SLOVAK LEGISLATION

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This paper is the outcome of the project APVV-18-0018 *Teaching at second chance schools from the perspective of a teacher and adult learner* financed by the resources of the Ministry of Education, Science, Research, and Sport of the Slovak Republic.

This text is a reaction to the reform processes in the educational system in Slovakia, which also affect the school education of convicts. The education of the incarcerated is not only regulated by school legislation but also by judicial laws. In several provisions, the Education Act specifically mentions education in correctional facilities, and vice versa, the legislation regulating the execution of the prison sentence uses pedagogical terminology and refers to the Education Act. The normative system governing the education of the convicted and those in custody is relatively complicated and, in some respects, ambiguous or internally incompatible. In Slovakia, an overview of the currently valid legislation that governs educational institutions in teaching the incarcerated, and correctional facilities in providing the conditions for education has not yet been processed in this form.

Keywords: Prison education. Legislative standards of education in prisons. Lower secondary education in prison. Secondary vocational education in prison. Second chance education.

1 The state of matters in the education of convicts: A brief overview

In Slovakia, the field of education of incarcerated adults and juveniles is far from explored, although it has a long tradition. Research in Slovak prisons is determined by the limits described by Temiaková (2021) and characterized as insufficient and partial. Therefore, in the given conditions, research focuses on persons released from prisons, as this target group is more accessible compared to those still incarcerated (e.g. Vanková, 2018; Papšo, 2007). Even though several studies are available on this issue (e.g. Šírová, Kováč 2009; Španková, Grenčíková, 2012; Papšo, 2007; Lukáčová, 2017; 2018; 2019; Temiaková, 2020a; 2020b; 2021; Temiaková, Lukáčová, 2020), only some of them are actually based on empirical findings provided by the incarcerated persons or their educators. One of the few comprehensive works on the topic of education of the incarcerated is a monograph by Temiaková (2021), dedicated to convicted women in the system of informal education in correctional facilities. Bulletins by the Corps of Prison and Judicial Guards (CPJG; their internal periodical) are regularly published and available to the public. They provide articles about educational activities carried out, the number of inmates who have successfully completed formal education, etc. Annual reports by the CPJG and reports from implemented education projects financed from EU funds, mainly by non-profit organizations, are a separate source of information.

The level to which education of the incarcerated is elaborated on in foreign academic literature is at a completely different level, be it from the viewpoint of institutional security, theoretical background, as well as empirical research. In the European space, there is the European Association of Prison Education (EPEA), a non-governmental non-profit organization that has branches in several European countries. In England, the Prisoner Learning Alliance, a not-for-profit organization, functions as a network of organizations and individuals with expertise and experience in prison education and aims to influence prison education policies in England and Wales. The Prisoners' Education Trust foundation, founded in 1989 in London, provides grants aimed at distance learning for convicts. It is mainly thanks to the activities of these, and similar, organizations, as well as EU programs relating to education that numerous studies and research reports are available in the field of the education of the incarcerated. The study 'Survey on Prison Education and Training in Europe – Final Report' (Hawley, Murphy, Souto-Otero, 2012), for instance, provides valuable insights into the current state of education of convicts in European countries.

It is one of the few specifically dedicated to the profile and support of convict educators. One of the interesting findings is that only 4 out of 26 countries require specific training for prison teachers. The UNESCO documentation center Institute for Lifelong Learning has published a bibliography of education in prisons, which lists publications issued between 2004 and 2007 on 14 pages. In the Scandinavian countries, especially Norway, the education of convicts is also abundantly researched and theoretically elaborated upon (e.g. Eikeland, Manger, Asbjørnsen, 2009; Langelid, Mäkki, Raundrup, Svensson, 2009; Tønseth, Bergsland, 2019). Education of the incarcerated is more intently studied in those countries where the rate of incarceration is generally higher and, at the same time, there are years of experience with a multicultural society (e.g. USA, Canada, Australia). In the USA, the Correctional Education Association has been in existence since 1945. It is a professional association of educators of (juvenile and adult) convicts, whose aim is, among other things, to support the implementation of quality education program by educators of the incarcerated by creating opportunities for mutual exchange of experience, publishing, professional development, and personal growth (Correctional Education Association).

1.1 Education as part of penitentiary care

In theory (since the legislation does not specify such classification), education in the conditions of incarceration and custody in Slovakia can be differentiated into two relatively separate areas – (1) penitentiary education, and (2) school (formal) education (second chance education). School education aimed at obtaining and increasing the level of one's qualifications is a systemic part of education in institutions for the execution of prison sentences and detention. Even though formal school education takes place within the framework of the treatment program, school legislation also enters into its implementation, and external employees – teachers – enter the premises of the institute. Differentiation of educational activities as a part of penitentiary care makes it possible to, more clearly, label the place, tasks, and possibilities of the professional people and institutions participating in the education of the incarcerated within the resocialization process.

Penitentiary education stands for educational activities and learning processes that are a permanent part of program for the treatment of convicts and can be separated from the system of formal lessons aimed at obtaining a certain level of education. Education of the incarcerated must be seen as a complex resocialization program rather than as an ordinary education process (Španková, Grenčíková, 2012). In practice, it is possible to define the differences between them (mainly from the viewpoint of the organization of education, its duration, staffing, results, and, especially, the goals of education). However, in legislation (*Act No. 475/2005 Coll. on the execution of a prison sentence and the Decree of the Ministry of Justice of the Slovak Republic No. 368/2008*) these differences are perceived as part of a united system of treatment of the incarcerated.

Penitentiary treatment includes the ways of contact between the prison staff and the incarcerated as well as all and any activities used to fulfil the purpose of serving a prison sentence. Act No. 475/2005 Coll. on the execution of a prison sentence, § 11 defines the treatment of the incarcerated as "a sum of activities aimed at ensuring the exercise of rights and obligations according to this act in a differentiated manner, at supporting and developing a sense of responsibility, compliance with laws and social norms, positive personality traits, respect for others, self-respect, and a positive relationship with the family. When dealing with the incarcerated, an effort is made to limit the adverse effects of the prison environment." Thus, the intentional impact on convicts is present in all components and processes of penitentiary institutional care. In § 16 of the act in question, education is defined as one of the means of treatment. These include:

- forms and methods of pedagogical and psychological action,
- methods of social work,
- constitutional guidelines,
- disciplinary authority,
- placement in work,
- educational and cultural activities.

The resocialization effect on the incarcerated serving a prison sentence presupposes the monitoring of educational goals in all activities that are part of dealing with the convicted (in the field of education, work, and leisure activities). In this way, education fulfils an important resocialization role, enabling the incarcerated, as well as those in custody, not only to obtain qualifications, increase the level of their education, or requalify, but also creates space for the intentional positive formation of an adult personality, following their functional involvement in the social life on the completion of their sentence. That is why such requests are heard more and more frequently that ask for the following of broader socio-educational goals, rather than merely emphasizing the instrumental nature of education (e.g. Wright, 2006; Torrijo, De Maeyer, 2019). It is necessary to deal with the question whether education of the incarcerated should only be aimed at obtaining a qualification needed on the labor market. Even though this function of education is paramount from the viewpoint of reintegration into social life, it raises doubts about the very goals of education in prisons, as it might lead to reducing education (not only in prisons) to the mere preparation of productive and applicable workers, disregarding educational goals connected to their personality growth (Armstrong, Ludlow, 2016). Critics of education focused in such a way claim that the educational needs of learners are merely a materialization of the employers' demands. Costelloe and Warner (2014) argue that "a considerable part of prison education aimed at future employment, as is provided in some countries, does not constitute education as generally understood in adult education, nor does it meet the requirements of prison education as recommended by the Council of Europe. Education is to also pursue broader goals aimed at the humanization of society through the cultivation of one's personality. The fulfilment of the purpose of serving a prison sentence is to take place in a way that prevents the deterioration of the psychological, social, and physical health of the incarcerated (Raszková, Hoferková, 2014). Apart from other forms of treatment, education has the potential to lead to the achievement of mature forms of behavior, the development of the ability to self-regulate, the promotion of self-esteem and respect for others, the formation of personal and social responsibility, the positive formation of volitional qualities, respect for social norms, the enhancement of knowledge, and other (Širová, Kováč, 2009).

In *Decree No. 368/2008*, education is defined more broadly as "a sum of activities of pedagogical and psychological influence on the convicted aimed at education, resocialization, and elimination of subjective causes of criminal activity with the aim of forming appropriate behavior and value orientation of the convicted in accordance with generally binding legal regulations". The organization of educational and interest activities is more closely framed by *Order No. 7 on the education and organization of interest and leisure-time activities of the accused and convicted* (2009). In *Act No. 475/2005 Coll. on the execution of prison sentence*, the education of the convicted is embodied in § 32, Points 1 to 3. According to this act, education of the convicted stands for "a sum of activities based on active participation of the convicted and aimed at their integration into society in accordance with their personal and social needs". According to § 32, Point 2, "a convicted person with suitable capabilities is to be allowed to acquire primary education, secondary vocational education, full secondary education, or participate in other forms of education that will enable them to obtain, or increase, their work qualifications." Since the stigma of serving a sentence gives a significantly negative impression within civil life, when issuing official documents on the acquired education or qualifications, it must not be obvious these were obtained while serving a sentence. In the act in question, education is perceived as a means of

increasing qualifications and succeeding in the labor market. However, education is more than qualification; it is a way to reconnect incarcerated persons with a moral community. It is a network of those with whom one has an ethical connection through the demands of justice, bonds of compassion, or a sense of duty (Wocial, 2018).

Programs to *eliminate the illiteracy of the convicted* are also a traditional part of education of the incarcerated. The numbers of those convicted who are illiterate, as well as the rates of illiteracy, are published in regular statistical yearbooks issued by the Corps of Prison and Judicial Guard that are to be found on their website.

Education of the incarcerated is more closely elaborated on in the *Decree of the Ministry of Justice of the Slovak Republic No. 368/2008*, which also uses the term 'education'. According to this regulation, inmates are allowed access to education, which consists of:

- general education,
- cultural and sports activities,
- social education,
- free use of library resources.

The Decree does not specify further education as a type of education. Thus, it is included in the *Yearbooks of the Corps of Prison and Judicial Guard* in lifelong education (retraining courses). It would be much clearer for the academic community if the institutions serving to oversee the execution of prison sentences adhered to the established classification of types of education. Since this is not the case, there is a risk that the data from the official annual reports of the Corps might be processed inaccurately. For instance, the *Decree of the Ministry of the Slovak Republic No. 368/2008* specifies the types of education the incarcerated can participate in in the following way:

- completion of primary school,
- completion of a retraining course, a course to increase or widen qualification,
- apprenticeship or training in selected study areas,
- school studies.

Education takes place in the form of modular teaching, social education, or participation in a distant form of study and in courses. Such classification of the forms of education also does not correspond to the established typology usually used in educational policies and school legislation. Among other things, the above regulation establishes the main form of the relationship between the institution for the execution of the prison sentence and the educational institution, according to which education takes place as specified by a contract and within conditions defined by a special regulation. Thus, the decree provides a framework for all types of education in correctional facilities (formal and informal education).

The *Yearbooks of the Corps of Prison and Judicial Guard* provide statistical data for the following types of education:

- general system of education (primary, secondary, higher professional, and university education),
- lifelong learning (retraining courses),
- informal education, formative education, edification, and group social counseling.

It would be useful to revise the types of education in *Decree No. 368/2008* and *The 2021 Yearbook of the Corps of Prison and Judicial Guard* (2022) and consolidate the inconsistencies with the types of education defined by school legislation and *Act No. 568/2008 Coll. on lifelong learning*.

It is full-time employees at these correctional facilities and external educational institutions who take part in the implementation of educational activities. In the following section, attention will be paid to a segment which, in the statistics of CPJG is referred to as the education system of

general, even though it also includes vocational education. The general system of education in correctional facilities, which stands for the term 'formal education' or 'school education' that we use, represents an opportunity to obtain an education for those incarcerated who, for various reasons, did not succeed in the initial cycle of education. While serving a prison sentence, they have a legislatively and practically provided second chance to obtain a higher level of education than that with which they started serving the sentence.

2 The subsystem of second-chance education of the incarcerated

In Slovakia, education of the incarcerated aimed at completing a certain level has a long history. The historical development of educating the convicted is presented in John's (2010) paper, in which he places the start of prison education in the first half of the 19th century. He outlines the key events and personalities shaping the system of educating in the incarcerated in the joint Czechoslovak state until the beginning of the 1990s. A similar paper focused on this area has not yet been published in the modern history of Slovakia.

School education of convicted adults is carried out based on several pedagogical, judicial, as well as andragogical and socio-legislative rules and regulations. In the following lines, the legal framework regarding the implementation of school second-chance education in penitentiary conditions is analyzed. According to the current legislation, education is available not only to the convicted, but also those in custody in remand institutions. The present paper, however, only mainly deals with education of the incarcerated at selected levels of education that enable them to obtain primary and secondary vocational education. As of 31/12/2021, persons who had completed primary education constituted the most numerous group (3,448 convicts), while the second most numerous were those who had completed secondary education without a school-leaving exam (2,969 convicts) (*The 2021 Yearbook of the Corps of Prison and Judicial Guard*, 2022).

2.1 The legal framework for obtaining lower secondary education and secondary vocational education in a prison environment

The system of second-chance education in correctional facilities for adults is elaborated on in detail both from the legislative viewpoint and from the viewpoint of practical implementation. Education aimed at completing a certain level is provided by external educational institutions, which, by their nature, according to valid legislation, and their own practice, primarily apply pedagogical approaches in mainstream school education. Most often, these are secondary vocational schools providing secondary vocational education and, to a much lesser extent, primary schools, which allow the incarcerated to complete their primary education in order to obtain lower secondary education.

According to *Order of the General Director of the CPJG No. 7/2009 on the education and organization of interest and leisure-time activities of the accused and convicted* (§2, Point 2), the goals, conditions, scope, forms, and organization of the education and training of the incarcerated, as well as the levels of education and the scope of attendance are defined by *Act on Education and Training No. 245/2008 Coll.* The paper mainly focuses on the implementation of primary and secondary vocational education in correctional facilities. However, to provide a full picture, it is necessary to mention that the incarcerated also participate in general secondary education. For instance, in 2021, 22 adult convicts participated in studies at secondary comprehensive schools (*The 2021 Yearbook of the Corps of Prison and Judicial Guard*, 2022).

The organization and course of education for obtaining lower secondary education and secondary vocational education in houses of correction is defined by the legislation of the Ministry of Education, Science, Research, and Sport of the Slovak Republic and the Ministry of Justice of the Slovak Republic:

- Act No. 245/2008 Coll. on Education and Training;
- Decree No. 320/2008 Coll. on Primary Education;
- Framework curricula and educational standards for completing lower secondary education (2015) (§ 30, Point 5 and § 42, Point 4 of the Education Act);
- Methodological instruction No. 22/2011 for the evaluation of primary school students
- Act No. 596/2003 Coll. on State Administration in Education and School Self-administration, § 19, Point 7;
- Regulation of the Government of the Slovak Republic No. 630/2008 establishing the details of the breakdown of funds from the state budget for schools and school facilities;
- Act No. 475/2005 Coll. on Serving a Prison Sentence;
- Decree of the Ministry of Justice of the Slovak Republic No. 368/2008;
- Order of the General Director of the CPJG No. 7/2009 on Education and Organization of Interest Activities and Leisure-Time Activities of the Accused and Convicted.

According to *Act No. 245/2008 on Education and Training*, the process of completing lower secondary education can last a minimum of three months and a maximum of one school year. As of January 1, 2022 (with effect from June 1, 2022), the Education Act was amended in § 31a, which regards education programs for completing lower secondary education. According to this amendment, the newly established Regional Offices of School Administration acquire significant competences in organizing this type of education. These are determined by the primary schools in respective regions that are to provide lower secondary education in the following school year. Applications for education are directed to them and they are also in charge of testing in order to obtain the relevant level of education (as an alternative method for those who do not want to attend an educational program). The authors of this paper positively perceive the above changes in the education system regarding obtaining lower secondary education in an effort to individualize the education itself. This should be done based on diagnosed educational needs of the participants – each applicant would take a written test before starting the educational program and the content of the education would be determined based on the results. However, the organization and time management of such education might prove troublesome. According to the new legislation, a natural person is to submit an application by December 15 of the current year. The application is to be submitted to the regional school administration office (designated by the applicant's place of residence) and is to be made public by the Ministry of Education. It can hardly be expected that the level of the digital skills in those interested in completing primary school would allow them to go through this process without problems. Following this, applicants have to take a written test that diagnoses the level of their knowledge and skills and determines their individual educational needs. By effect, eight months pass between the submission of the application and the start of education, which might present a significant barrier to entry into education. In case of convicted adults, such type of education will be problematic for prison educators to plan. In such a long period of time (from signing up for education until the start of the course), some convicts may be released, moved closer to their place of permanent residence, another facility, or be paroled. Such persons are out of reach of prison pedagogues or correctional facilities. The method of selecting schools and their distance from potential participants in education is also questionable. It is, thus, debatable to what extent changes to the current situation will reflect the individual needs of people with no education or the specific conditions of education in prisons. It is also not clear how, and according to what criteria, particular primary schools will be selected that are to carry out the education programs in question.

2.2 Legislation regulating the completion of primary school while serving a sentence

According to *Act No. 245/2008 Coll. on Education and Training*, as of 2012, both primary schools and secondary schools can provide courses aimed at obtaining lower secondary education,

the target group being those natural persons who did not obtain lower secondary education at the age determined for this (according to § 16, Point 3, letter b). For these, a primary school (following § 30 Point 5 of the Act) or a secondary school (*Act No. 324/2012 Coll.*, Article IX, Point 16, amending Point 4 of § 42 of *Act No. 245/2008 Coll. on Education and Training*) is allowed to provide courses in order to obtain this level of education. The education is completed by an examination in all subjects (except for subjects with an educational focus) in front of a committee. The conditions of the examination that finalizes lower secondary education are defined by *Methodological Instruction No. 22/2011 on Evaluation of Primary School Students*, §7, Point 1, Letter h and § 8, Point 2. The form and length of education is regulated by *Decree No. 320/2008 Coll. on Primary Education* in § 19, according to which school can provide education in full-time and part-time form. The forms of education are regulated by § 54 of the Education Act, while part-time education can take evening, remote, or distance form (§ 54, Point 3). The duration of the course is determined by the school principal based on the level of the participant's completed education; however, it may not exceed one school year. At the request of the facility, the school can also provide individual education according to § 26, Point 5 of the Education Act.

The content of the education is defined by the *Framework curricula and educational standards for completing lower secondary education* (§ 30, Point 5 and § 42, Point 4 of the Education Act), where the compulsory subjects and their weekly scope are determined. These are, however, only available for the full-time form of study. The framework curriculum defines the competences of the education graduate, among them "the ability to find (by means of modern ICT) new/necessary information and to be able to process/utilize it". Similarly, Information Technology a compulsory subject, is focused on working with the internet. Education defined in this way cannot be fully carried out in prisons where the use of the internet by the incarcerated is not allowed.

Education of the incarcerated takes place in detached workplaces set up for this purpose in facilities for the execution of detention and facilities for the execution of prison sentences. According to *Act No. 596/2003 Coll. on State Administration in Education and School Self-administration* (§ 19, Point 7), an allocated workplace is understood as a permanently established closed space in which regular educational activities are carried out and follows the school's educational program. Only practical training can take place outside the facility as part of secondary vocational education (e.g., school workshops). The maximum number of educated convicts in a primary school class is determined by *Act No. 245/2008 Coll. on Education and Training* (§ 29, Point 11) and the *Order of the General Director of the CPJG No. 7/2009 on education and organization of interest and leisure-time activities of the accused and convicted* (§2, Point 3), according to which a maximum of five pupils in custody or serving a prison sentence can be present in primary-school classes.

Specific data on the educational structure of the incarcerated as well as their participation in individual types of education were sourced from the *2021 Yearbook of the Corps of the Prison and Judicial Guard* (2022). Of the total number of 587 convicts and those in custody included in the general education system in 2021, there were 6.8% (40 persons) of the convicted and detained in primary education. Out of these, the largest part, almost 68%, consisted of juveniles, while those on remand predominated. In 2021, the group of convicted adults without primary education accounted for 7.3% of the total number of convicted. In the statistics, the CPJG reports separately a group of illiterate convicts who, in 2021, made up 2.3% of the total number of the convicted. It can be assumed that this group also consists of people who have not completed primary school. With regard to the overall structure of the convicted, it can, thus, be concluded that people without primary education account for almost 10%. Adding the almost 40% of those convicted who had only completed primary school, the target group of second-chance education in correctional facilities made up almost half of all convicts in 2021. At the same time, only 6.8% of convicted

adults and juveniles were included in the general education system in 2021.

2.3 Conditions for obtaining secondary vocational education

In 2021, 547 convicted and those in custody, regardless their age, participated in secondary education (vocational and general). Taking a closer look at convicted adults, they made up almost 89% of all those involved in education in 2021. What is, however, more important (at least from our viewpoint) is the fact that the convicted and those in custody whose highest level completed was elementary education made up 39.8% of the entire prison population. However, only slightly more than 15% of them were involved in secondary education (*The 2021 Yearbook of the Prison Corps and Judicial Guard*, 2022), which is consistent with the findings of a meta-analysis carried out by Hawley, Murphy and Souto-Otero (2013). It cannot be said 15% of all adults and adolescents without education is a figure one can be satisfied with. Still, considering the fact that, in Slovakia, only a little over 1% of the general population of adults aged 25-64 participate in formal education (Participation rate in education and training (last 4 weeks) by sex and age, 2020), the closed penal system provides a more accessible and several times higher second chance to increase the level of one's education. Furthermore, the 1% not only includes secondary education of adults but all types of formal education. It seems that the chance to increase one's level of education in Slovakia is fifteen times higher in prison than in the civilian population. This is certainly due to several factors; among these, probably the most important role is played by the fact that the loss of freedom means isolation, which, however, removes obstacles to involvement in education in civilian life. Education comes to the convicted, who do not have to put any extra effort to find out the necessary information and complete the necessary formalities before entering education. The barriers that adults most often list as preventing them from entering education, i.e., time and place, do not play a role during the serving of the sentence. Being rid of the responsibilities of civilian life and assuming the role of a incarcerated person in a non-free environment, thus, paradoxically, opens up space for the opportunity for self-development.

According to § 33 Point 6 of the Education Act, the minimum number of students in a full-time secondary-school class is 17, while in the part-time form of study only 8. The classes of convicts in correctional facilities have an exception; there, the founder of the secondary school decides on a lower number of students in the class. In the full-time form, it can be nine students while, in the part-time form of study, as few as five students can make up a class (§ 33, Point 7 of the Education Act). This regulation is supplemented by the *Order of the General Director of the PCJG No. 7/2009 on the education and organization of interest and leisure-time activities of the accused and convicted*, according to which a detached class of a school is established for a minimum of one and a maximum of five pupils. If the number is higher, another detached class is established (§ 3, Point 2).

In the field of financing, the situation in the education of the convicted, compared to mainstream education, is rather specific. The standards for convicts involved in education aimed at obtaining lower secondary education and secondary vocational education are framed by the *Regulation of the Government of the Slovak Republic No. 630/2008*, which defines the breakdown of funds from the state budget for schools and school facilities. The standard for a student is set according to the form of study (§ 4, Point 4) as follows: the standard for a student studying in the part-time form is 40% of the standard for a student studying in the full-time form. The standard for other students is 10% of the standard for those studying in the full-time form of study. The standard for a student studying in a detached class in a correctional facility is 300% of the standard for a student studying in a full-time form. The standard for a student studying in the individual form is 30% of the standard for a student studying in the full-time form. According to the above information, the issue of financial profitability should be one of

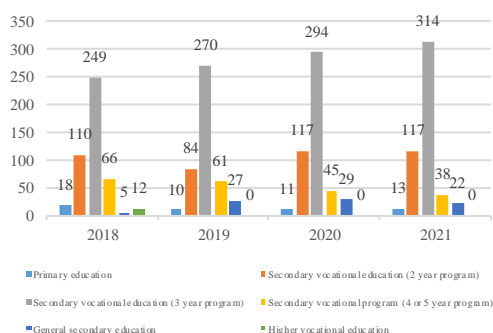
the most important motives for schools to strive for greater involvement of the incarcerated in education, especially in the case of detached classes that are part of correctional facilities.

In 2022, the legislation defining the financing of secondary education in Slovak prisons was amended. According to the *Government Regulation No. 630/2008*, starting with the school year 2022/2023, a subsidy of 300% of the standard for a student will only apply to the incarcerated in full-time secondary schools up to the age of 27 (which is the maximum age at which they are still considered students). All those over the age of 27 are no longer considered students but rather participants in education (Section 2, Point ah of the Education Act) and will only be subject to the standard in the amount of 40%. Several schools reacted to this change by postponing the admission of new pupils to the first years of secondary education in prisons. Hopefully, the legislatively will resolve the situation in a way that the financing of secondary education suffices and does not present another obstacle for the participation of the incarcerated in education.

Secondary vocational education can also be entered in by those convicts who had not completed lower secondary education, or cannot provide proof of its completion (§ 62, Point 4). However, they can only enter lower secondary vocational (so-called F programs). Another option for the incarcerated is to obtain a degree by means of an individual curriculum designed by the school (*Act No. 245/2008 Coll. on Education and Training*, § 26, Point 5 and the *Order of the General Director of the PCJG No. 7/2009 on education and organization of interest and leisure-time activities of the accused and convicted*, § 3, Point 2). It is not known to what extent this form of education is used, but in the general population its uptake is the lowest. The PCJG does not report separate statistics for this form; thus, its minimum representation in the facilities could be assumed. The individual form of education is used by civilians in such cases when the student cannot participate in regular classes for objective reasons, most commonly due to work-related obligations, working abroad, etc. However, in correctional facilities, attendance is not a problem that would call for a solution by an individual curriculum.

Figure 1 shows the data on the number of convicted adults (excluding juveniles and those on remand) enrolled in individual types of education (as defined by the Corps, in the general education system).

Figure 1: The incarcerated involved in individual types of education between 2018 and 2021 (general education system)



Source: own processing based on the PCJG Yearbooks for 2018 – 2021

It is not surprising that the largest proportion of the incarcerated are involved in education aimed at obtaining a certificate of apprenticeship (three-year programs) allowing them to gain qualifications in a shorter period of time and, in this way, increase their chances of employment on their release. The incarcerated involved in two-year programs, which are not completed with a certificate of apprenticeship, attend in smaller,

but still relatively large, numbers. It could be assumed that this situation will change in the near future as a result of the changes embedded in the *Strategy for lifelong learning and counseling for 2021-2030* (2021). It clearly strives to reduce the so-called F-programs, which are often a dead end for people without education and which, until now, represented the only possibility to enter secondary education without completing primary school.

In Figure 1, there is no column dedicated to university education. In spite of the fact that some of the convicted are educated at secondary comprehensive and secondary vocational schools, during the observed period, none of the incarcerated managed to enter education higher than secondary (higher vocational or university) level while serving their sentence. The low representation of the incarcerated in higher (higher vocational and higher university) education is something that would require a more detailed analysis or targeted research. One would have to go as far back as 2007 to find the three most recent incarcerated people participating in university education in an open ward in the form of individual study (alongside employment). At the same time, this option has been included in the legislation for a long time for those incarcerated who were convicted of less serious crimes and, thus, included in the differentiation group 'A'. Such education should take place in the part-time form, with the exception of maximum-security facilities (*Act No. 475/2005 Coll. on the execution of a prison sentence*, § 32). The Updated Prison Concept of the Slovak Republic for the years 2011 to 2020 (2021) envisages a draft amendment to the Act on the execution of a prison sentence in such a way that removes the existing legislative obstacles to the involvement of so-called dangerous convicts or the incarcerated with a mental or a personality disorder in educational, edifying, interest, and sports activities. In Slovakia, no research has been carried out that would explain why the convicted do not participate in university education. It can only be assumed that it is due to the lack of a tradition of university education in the disadvantaged population, a strong tradition of vocational education, and the significant industrial nature of the national economy.

Since the legislation enables the incarcerated to attend university education, it is primarily on the part of the responsible institutions to help generate greater interest. It is possible not only to enter university education but also to continue in it during an unconditional prison sentence, provided the convict takes the initiative and study conditions are jointly agreed by the facility and the university. Therefore, a prerequisite for higher representation of the incarcerated in university education is an increased interest of universities in the convicted and initiating cooperation between universities and prisons. It is important to focus on the issues of offering university education, aligning the conditions of university studies with the prison regime, and solving the mechanisms of targeted support for the incarcerated towards university studies.

3 Conclusion

Programs of formal (school) education are available in Slovak prisons; however, as Taxman (1998) claims in the context of prison education, the programs are unified and do not take into account the individual educational needs and preferences of the incarcerated. It is primarily secondary education programs that are available in Slovakia, aimed at succeeding in the labor market, which also seems to be the main leitmotif of formal education in prisons – allowing the incarcerated to complete their education while serving their sentence, which will increase their prospects on the labor market on being released from prison and, as a consequence, increase the chance for an orderly life without committing further criminal activity. Educational goals reduced to increasing the employability of the incarcerated engulf all other legitimate goals of lifelong learning, such as active citizenship, social solidarity, and personal fulfillment. In this regard, it would be useful to research the rate of recidivism among those who completed second-chance education while serving their sentence and those who return to prison and had not been educated. For whom are the so-called 'revolving doors' of prison open more or less? Education alone is not enough to stop

a person from committing criminal activity, although there is ample evidence supporting the fact that level of education is closely related to anti-social behavior. For education to be truly effective, the curricula offered must take into account the specific needs of incarcerated learners (e.g. low self-esteem and aspirations, academic difficulties, alcohol dependence, etc.) (*Inmate education*, 2002). To achieve this, high-quality, engaged, and competent educators are necessary who understand the specific conditions of the educational environment in prison and are sufficiently responsive to the particular characteristics and needs of incarcerated learners. It also requires sufficiently clear and comprehensible legislation aimed, by its very nature, at creating favorable conditions for education rather than limiting and controlling it.

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Secondary Paper Section: AM

EUROPEAN MODEL OF PERSONAL DATA PROTECTION (GDPR) IN THE PRACTICE OF EMPLOYEE REPRESENTATIVES WITH REGARD TO THE COMMUNICATION PROCESS

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The result was created in solving the project "Digital Audit and Risk Management in Industry 4.0" (7427/2021/02 IGA VŠFS) using objective oriented support for specific university research of the University of Finance and Administration.

Abstract: The authors deal with the issue of determining the appropriate legal bases for the processing of personal data by employee representatives. The main objective of this paper is to assess the use of the relatively new European legislation on the protection of personal data in the specific environment of individual and collective employment relationships on the part of employee representatives. In the paper, the authors try to confirm that employee representatives in addition to the consent of a natural person concerned are entitled to act in line with another legal basis - the public interest (or fulfillment of legal obligations) given their position in the implementation of individual and collective labor relations. According to the authors, the choice of a specific legal basis will be based on the assumption that the employee representatives process personal data of the natural persons concerned, e.g. for the purposes of exercising the competencies granted by the relevant labor law regulations or for the purposes of managing internal relations of employee representatives (trade union membership as a personal data of a special category, fulfillment of rights arising from the trade union membership by a natural person). The authors substantiate their claims with relevant references to the practice, international legal documents and subsequently emphasize their use within specific labor law institutes.

Keywords: GDPR, personal data, communication, employees' representatives, trade union affiliation, legal basis.

1 Introduction

According to Art. 11a of the Labor Code, with regard to the protection of personal data employee representatives represent a sui generis subject not only in the area of legal regulation of individual or collective labor relations, but also in the area of relevant labor law concerning personal data protection and privacy in general. Thus, any legal institutes in which personal data of natural persons are processed on the basis of the European legal framework – the GDPR, must respect the basic division of powers of employee representatives at the workplace towards the employers and third parties, towards members of the relevant bodies of specific forms of employee representation at the workplace as well as the employees they represent. Apart from the above, however, when choosing the right approach to the protection of personal data of natural persons, the attention shall be paid to individual types of employee representatives in the workplace and differences in internal conditions, e.g. a trade union organization represented by the relevant trade union body, the employee council or employee trustee. Prior to choosing an appropriate legal basis for the processing of personal data of natural persons, the unique position of employee representatives in the workplace must be taken into consideration. The nature of activities carried out by employee representatives, their legal status in national legislation and scope of granted competencies and authorizations are based on international regulations to which Slovakia is bound. Therefore, apart from regulating the civic association established under a special regulation, the internal and external processes of personal data protection policy should also take into account personal data of employees of specific labor institutes/ bodies and those of natural persons who have become members of a trade union. With regard to the legal form according to the law on the association of citizens, a trade union has the legal character of a civic association - it is not registered as a legal entity would, however, records are being kept on its existence. Its status arises from international documents of the International Labor Organization or European legislation, which give it a wide range of rights and obligations in the field of individual and collective labor relations

(Androniceanu & Tvaronavičienė, 2019; Kubeš & Ārāņš, 2018). These, in turn, give rise to secondary legal or labor relations (e.g. employment relations, participation in court proceedings according to special legal regulations on the protection of employees' rights, etc.). Therefore, we must take into account this specific nature of the position and competences of employee representatives in the workplace when creating internal regulations on personal data protection. If we base the nature of employee representatives on the wording of Art. 11a of the Labor Code, the legal framework governing the competencies of employee representatives will be the same. The only thing that would differ is the internal environment due to different legal status. A trade union represented by a competent trade union body is a legal entity - a civic association established under a special regulation. An employee council or employee trustee is an entity without legal personality which in a certain respect has a labor subjectivity for the exercise of competencies granted by the relevant labor regulations, e.g. The Labor Code, the Social Insurance Act, the Health and Safety Act, OHS, the Protection of Public Health, etc.

Employees, either directly or through their representatives, as well as the employee representatives themselves, have a legally guaranteed right to information, negotiation, co-decision and oversight. In addition to the obligations stipulated by the law, the employer must also meet the requirements of the employee representatives to which he has committed himself, either through an internal regulation or a collective agreement / higher-level collective agreement (Pacalajova & Kubinec, 2021). The nature of competencies varies and includes cases of action related to the employer's obligation to inform and discuss the termination of employment by termination or immediate termination under Art. 74 of the Labor Code or unjustified absence at work under Art. 144a, par. 6 of the Labor Code, obtaining consent with the employment termination from the employee who is a member of the relevant trade union body under the provisions of Art. 240, par. 9 of the Labor Code, etc... In addition to the standard exercise of competencies resulting from the implementation of individual employment relationships concerning the actual performance of the dependent work (Petrů & Tomášková, 2020), the employer may be subject to other obligations arising, for example, from a collective agreement in relation to the emergence of legal claims of employees or a trade union organization (by using benefits and contributions from the social fund, e.g. in connection with contributions for medical supplies and medicines, employer's contribution to the employee's vacation, language training, etc...) (Steindl, 2022).

The general premise that employers should take into account is that the implementation of the legal competence of the employee representative (also related to personal data protection) cannot be denied. In view of the legal framework and competences of employee representatives, by ignoring such rights the employer runs the risk of being subject to sanction for non-compliance with the relevant labor law.

2 Methods and methodology

The main objective of the paper is to assess the implementation of the relatively new European legal framework regarding the protection of personal data in the specific environment of individual and collective employment relationships on the part of employee representatives. Most publications on the subject matter focus exclusively on the identification of the legal bases of personal data processing by the employer and bring no solutions, e.g. in the internal environment of employee representatives, also in relation to the primary existence of personal data of a special category - trade union affiliation according to Art. 9 of the GDPR. The authors are therefore interested in the transnational context of the relevant legislation, determined in particular by the GDPR and other European and transnational sources of law. Moreover, the authors also want to

establish a theoretical and legal background of the issue, thus helping the entities concerned to determine further steps in this regard. The aim of the authors is to justify the use of the public interest as a legal basis - a rare issue in practice. A partial aim of the paper is to assess personal data processing operations carried out by a trade union as one of the forms of employee representation. A trade union processes personal data of a special category - trade union affiliation. Given the nature of the researched issues, we chose a combined methodological approach based on the use of selected qualitative and logical-cognitive methods. Critical in-depth analysis of the legal status, logical-cognitive methods such as induction, deduction, analysis, synthesis from qualitative methods were also used.

3 The legal framework of personal data processing – natural persons

Prior to the adoption of the GDPR, the personal data protection was governed in particular by Directive 95/46 / EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, which has been incorporated into various national legal systems of the Member States very differently (Gumzej, 2021). This has often led to inconsistent application practices by supervisory bodies across Member States of the European Union. The current regulation, unlike Directive 95/46 / EC, will be directly applicable in the Member States (Halasi et al., 2019). The adoption of the General Data Protection Regulation, along with its recitals, aimed at ensuring a consistent and high level of protection of individuals against unauthorized interference with their rights and freedoms. Even though the basic principles and objectives set out in Directive 95/46 / EC have been maintained by the Member States, the way they were incorporated into the law of the Member States meant differences in the implementation of personal data protection across the European Union (Wolters, 2017).

The basis for any legitimate processing of personal data of natural persons concerned is the existence of relevant legal basis under the GDPR (Wachter, 2018). With regard to the above, it is necessary to first identify the competence or activity that the employee representative has / wants to perform, identify the very purpose of this activity (Hsu, 2018) and then look for a suitable legal basis that would enable processing activities in question. Each purpose of data processing must therefore have its legal basis, except where the original purpose is compatible with another processing purpose (Pitra & Zaušková, 2014). According to Art. 6 of the GDPR, the following legal bases cover the necessary processing operations carried out by employee representatives:

- consent of an employee (a);
- processing for the purpose of performing a contract (b);
- processing is necessary under a special regulation or international agreement (c);
- processing is necessary to protect the life, health or property of employees or another natural person (d);
- processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority conferred on the employer (e);
- processing is necessary due to legitimate interest (f).

Quite often we encounter a legal opinion that the legal basis for the processing of personal data of natural persons by employee representatives is reduced to the fulfillment of obligations under the provisions of Art. 6, par. 1, letter (c) of the GDPR or the consent of the natural person concerned pursuant to Art. 6, par. 1, letter (a) of the GDPR. However, the insight into the existence and activities of employee representatives is to some extent superficial since it does not take into account their exceptional position in the legal order and in supranational legislation. The position of the employee representative has changed greatly since the 18th century (Dexe et al., 2022). Apart from his role in improving working and wage conditions of employees, the employee representative now also oversees the compliance with

working and wage conditions of employees. Although the position of the employee representatives was originally created due to collective bargaining of more favorable working and wage conditions for employees (using coercive means to achieve the goal), the position nowadays entails quite different activities. Whether it is a continuous resistance of employers to negotiate working and wage conditions of employees through a collective agreement, the shift in the nature of collective bargaining from revolutionary to more “civilized” and formalized or the concept of using external experts instead of trade union members to negotiate working and wage conditions, the role of employee representative is changing (Raisová et al., 2020). The shift in their activities and competences (and in fact their very nature) caused by amendments to the national and supranational legislation and documents meant they were awarded the right to information, negotiation, co-decision and especially the right to oversee (Mura et al., 2019). Employee representatives are thus increasingly replacing the supervisory bodies - now they oversee the compliance with relevant labor laws on a regular basis, and in this respect fulfill (albeit informally) the power of the state - enforcement of regulations. The activities of employee representatives changed from originally informal and private activities to exercising legal, legitimate and especially effective state-like powers, although they do not have such authority or competence. However, this legal-theoretical shift is characteristic of states (although being democratic - the Czech Republic, the Slovak Republic, the Republic of Poland, the Republic of Hungary) in which the public interest (with regard to the basic premise established by law and relevant labor law in the form of the state's obligation to ensure the right of natural persons are met under Article 36 of the Constitution of the Slovak Republic - the right to just and satisfactory working conditions and remuneration ensuring a decent standard of living, also the right to protection against arbitrary dismissal and discrimination in employment, occupational safety and health at work, maximum working hours, adequate time to rest after work and the like) is poorly implemented (or not implemented at all) by the relevant public authorities. The suggested formalism in the supervision of compliance with labor law, especially in the field of protection of life and health of employees in relation to the working conditions in which they perform dependent work, and inefficiency of the state power (for subjective or objective reasons) are the reasons why the position of employee representatives is shifting and moving to the area where it replaces the state power, thus confirming the premise that employee representatives perform activities in the public interest. Incidentally, this assumption is also evidenced by the development of modern labor law regulations in the area of competencies of employee representatives, e.g. in the provision of Art. 149 of the Labor Code, the competent trade union body is granted the competence to perform inspect the state of occupational health and safety, while according to Art. 149, par. 5 of the Labor Code, the costs incurred by performing such activities shall be reimbursed by the state. Thus, in the interest of fulfilling the public interest and the basic internal functions of the state, the legislator entrusts the performance of this activity (which should normally be carried out in full by itself) to a private entity, while also committing to cover its costs. However, a similar approach is included in the performance of oversight activities of employee representatives under Art. 239 of the Labor Code, where the legislator (despite the private nature of the employment relationship) strengthens the position of one of the parties to the employment relationship by granting it the right (which usually belongs to a public authority) to demand certain action from another entity.

Based on the above, we can therefore conclude that there is a possibility of using the legal basis under Art. 6, par. 1 letter (e) of the GDPR, which allows “*processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority*“. However, we must be able to substantiate this claim with regard to a specific activity carried out by a trade union or its relevant body. For the purposes of the legal interpretation of the provision in question, Art. 6 of the GDPR, we assume that national law is not required to explicitly authorize, dictate or indicate an entity to carry out a specific

processing operation with personal data; in this respect, it is sufficient that such a role or authority is backed (at least in general) by the valid legal order. With regard to the above, we refer to the provision of Art. 6, par. 3 of the GDPR, which states that *“the basis for processing shall be determined in EU or Member State law”*, or the recital 45 of the GDPR which states *„This Regulation does not require a specific law for each individual processing.”* Although Article 6, par. 3 of the GDPR states, from the point of view of the substantive preconditions for its application, that the legislation may also stipulate a specific purpose of processing, categories of recipients, etc., it is only optional (*“that legal basis may contain specific provisions”*). It may not even be a law, but according to recital 41 of the GDPR, it may also be a by-law (e.g. a resolution of a government or municipality) (Kuc-Czarnecka, 2019).

Therefore, if we start from the assumption that the legal basis in question may be used by both public authorities and private entities (e.g. employee representatives), which may be required under the law to carry out their activities in the public interest, the legal basis in question may be used in terms of individual and collective employment relationships. To confirm the above statement, reference may be made to the recital 45 of the GDPR Regulation, which states that *„It should also be for Union or Member State law to determine whether the controller performing a task carried out in the public interest or in the exercise of official authority should be a public authority or another natural or legal person governed by public law, or, where it is in the public interest to do so, including for health purposes such as public health and social protection and the management of health care services, by private law, such as a professional association.”* Following the above argumentation, it is therefore necessary to identify the basic legislation that justifies the possibility of using the public interest as a legal basis in order to carry out labor law-related actions - the establishment and existence of the employee representatives themselves at the workplace. The legal basis is given by international regulation by which Slovakia is bound, in particular the Conventions of the International Labor Organization. The Conventions of the International Labor Organization defines the standard legal framework for the establishment and operation of trade unions in the workplace, namely the Convention on the Application of the Principles of the Right to Organize and Collective Bargaining no. 98 of 1949 (Geneva, 1 July 1949, 18 July 1951, 1 January 1993, no. 470/1990 Coll., point 33 of the notification of the Ministry of Foreign Affairs of the Slovak Republic no. 110/1997 Coll.), Workers' Representatives Convention no. 135 of 1971 (Geneva, 23 June 1971, 30 June 1973, 17 September 2010, no. 16/2010 Coll.), Convention on the Promotion of Collective Bargaining no. 154 of 1981 (Geneva, 19 June 1981, 11 August 1983, 17 September 2010, No. 14/2010 Coll.), Convention on the Protection of the Right to Organize and on Procedures for Determining Conditions of Employment in the Public Service no. 151 of 1978 (Geneva, 27 June 1978, 25 February 1981, 22 February 2011, No. 171/2010 Coll.) and the like.

The legal framework of internationally-recognized obligations in this area is completed by European labor law, in particular Directive 2002/14 / EC of the European Parliament and of the Council of 11 March 2002 establishing a general framework for informing and consulting employees in the European Community (sets out the basic legal framework for the competences of employee representatives), Council Directive 2001/23 / EC of 12 March 2001 on the approximation of the laws of the Member States relating to the safeguarding of employees' rights in transfers of undertakings, businesses or parts of undertakings or businesses (mandatory information obligation, conditions in order to safeguard employment opportunities, etc.), Council Directive 98/59 / EC of 20 July 1998 on the approximation of the laws of the Member States relating to collective redundancies (mandatory information obligation, consultation powers to protect employees' rights, etc...).

We could proceed in a similar way when stating the directives of the European Union and the European Parliament relating to the occupational health and safety, scheduling working hours, etc. According to Art. 4, par. 4 of Directive 2002/14 / EC of the European Parliament and of the Council of 11 March 2002 establishing a general framework for informing and consulting employees in the European Community, it may be stated that *„Consultation shall take place: (a) while ensuring that the timing, method and content thereof are appropriate; (b) at the relevant level of management and representation, depending on the subject under discussion; (c) on the basis of information supplied by the employer in accordance with Article 2(f) and of the opinion which the employees' representatives are entitled to formulate; (d) in such a way as to enable employees' representatives to meet the employer and obtain a response, and the reasons for that response, to any opinion they might formulate; (e) with a view to reaching an agreement on decisions within the scope of the employer's powers referred to in paragraph 2(c)“.*

Similarly defined competencies (*“work”* tasks) and authorizations and self-imposed duties formulated as legally determined obligatory action of employee representatives can be found in many national regulations (Hitka et al., 2017; Lindqvist, 2018). In particular, this complex of rights and obligations of employee representatives' participation in decision-making is contained in the Labor Code. The Labor Code gives the employee representatives competencies in more than 84 specific labor law areas, predominantly in the area of working time regulation and scheduling (e.g. introduction of uneven distribution of working hours according to Art. 87 and Art. 87a of the Labor Code), determination of the beginning and end of working hours and schedule of shifts according to Art. 90, par. 4 of the Labor Code), in the field of occupational health and safety at work (e.g. adoption of regulations in the field of occupational health and safety according to Art. 39 of the Labor Code, performance of oversight according to Art. 239 and Art. 149 of the Labor Code), adjustments to the basic working conditions of employees (e.g. accepting the working rules by the employer according to Art. 84 of the Labor Code), in the area of remuneration of employees (agreement on wage conditions according to Art. 119 of the Labor Code in connection with Art. 43, paragraph 1, letter d) of the Labor Code, etc.). The related obligations and authorizations can also be found in other relevant labor law regulations, e.g. in the provision of Art. 7, par. 4 of the Social Fund Act (*„The creation of the fund, the amount of the fund, the use of the fund, the conditions for providing contributions from the fund to employees and the method of proving expenses to employees shall be agreed between the employer and the trade union body in the collective agreement.”*), in the provision of the Art. 19, par. 1 of the Occupational Health and Safety Act (*“The employer is obliged to appoint one or more employees as employee representatives for safety on the basis of a proposal of the relevant trade union body, employee council or voting of employees if there is no trade union body or employee council. A staff member may be nominated or elected as an employee security representative only with his written consent.”*) and the like.

All European and international legislation stated above establishes rights and obligations of employee representatives in the workplace. No similar position is held by any other subject across the entire legal order - in addition to own competencies, the position of the employee representative entails also competencies specific to public authorities. For this reason, using the public interest as the legal basis seems fit as it touches the subject of individual and collective labor relations. The only restriction in this respect is the provision of Art. 21 of the GDPR, which requires personal data of natural persons to be processed in such a way and only to the extent possible that would *„demonstrate compelling legitimate grounds for the processing which override the interests, rights and freedoms of the data subject or for the establishment, exercise or defence of legal claims”* (Comandè & Schneider, 2022). With regard to the nature of the performance of competencies of employee representatives at the workplace, and given the fact that they also

process personal data of a special category (e.g. membership in a trade union, information on the health of natural persons, etc.), the need to meet the precondition for the processing of personal data of a special category laid down in Art. 9 par. 2 of the GDPR shall be taken into account (Krajnakova & Vojtovic, 2017).

With regard to the cases defined in Art. 9 par. 2 of the GDPR, it is possible to meet the condition contained in letter b) as amended *“processing is necessary for the purposes of carrying out the obligations and exercising specific rights of the controller or of the data subject in the field of employment and social security and social protection law in so far as it is authorised by Union or Member State law or a collective agreement pursuant to Member State law providing for appropriate safeguards for the fundamental rights and the interests of the data subject”*, letter g) *„processing is necessary for reasons of substantial public interest, on the basis of Union or Member State law which shall be proportionate to the aim pursued, respect the essence of the right to data protection and provide for suitable and specific measures to safeguard the fundamental rights and the interests of the data subject”* or letter h) *„processing is necessary for the purposes of preventive or occupational medicine, for the assessment of the working capacity of the employee, medical diagnosis, the provision of health or social care or treatment or the management of health or social care systems and services on the basis of Union or Member State law or pursuant to contract with a health professional and subject to the conditions and safeguards referred to in paragraph 3”* (Goddard, 2017). If we were to state specific cases of application of the conditions of processing personal data of a special category without the consent of the natural person concerned, it would not be possible due to their number. Nevertheless, these conditions would concern various labor institutions and issues - bodies in charge of investigating work-related accidents and other accidents at work according to Art. 10 in conjunction with Art. 17 et seq. of the Act on Occupational Safety and Health, bodies processing information on the health status of employees for the purposes of discussing the termination of employment according to Art. 74 of the Labor Code in conjunction with the provision of Art. 63, par. 1, letter c) of the Labor Code, the representation of employees in connection with the employment relationship under the provisions of Art. 229 of the Labor Code (with a possible link to Art. 232, par. 2 and par. 3 of the Labor Code), or the issue of representing the employee in filing a complaint to the employer under Art. 13, par. 5 of the Labor Code due to non-compliance with the principle of equal treatment, breaching the principles of non-discrimination or breaching the principle of non-abuse of law or its exercise in accordance with good morals and the like.

Using the public interest as a legal basis in the processing of personal data of natural persons (employees, trade union members) thus represents a wide range of cases and situations defined not only by generally binding legal regulations, but also in an intra-union regulations and collective agreements with references to international law in the form of the right of employee representatives (specifically trade unions) to associate and to independence from interference in intra-union activities by public authorities. The above issues may lead to different purposes of processing personal data of natural persons - from the administration of the registry and the register of mail through the resolution of complaints of natural persons, security and protection of property, information, life and health, assets (including network security, security of buildings (Peukert et al., 2022)) to the actual establishment and management of membership of natural persons in trade unions, implementation of individual and collective labor relations, elections to trade unions and employer's bodies arising from special legal regulations (e.g. the Commercial Code), or the disclosure of information on the performance of employment activities at the employer (Nad'ová Krošlákova et al., 2021).

The use of the legal basis is evidenced by yet another presumption. This presumption lies in the very nature of the formalized results of conducting (European) a dialogue with the employer or conducting collective bargaining with the employer

under the Collective Bargaining Act as a formal source of law. The normative part of the collective agreement has a generally binding legal character (*erga omnes* scope), i.e. it applies to an indeterminate number of addressees of legal norms who do not even have to have an economic relationship with the employer who entered into the collective agreement. Indeed, company collective agreements often contain obligations that are effective *vis-à-vis* third parties, generally granting them a range of rights and benefits as if they were employees of the employer (e.g. various types of allowances and benefits for former employees of the employer and their family members), for example, the right to eat at the employer's canteen, receive a financial contribution for meals according to Art. 152, par. 8, letter c) of the Labor Code, to be involved in various events organized by the employer, etc. An even wider range of potential addressees of legal norms can be identified in the case of legal effects of a higher-level collective agreement, provided that they meet the conditions of a representative higher-level collective agreement under Art. 7 and Art. 9a of the Act on Collective Bargaining. A notice of a conclusion of such an agreement is published in the Collection of Laws of the Slovak Republic. In this respect, the normative part of the collective agreement, including its generally binding nature, has obvious features of an act (the actual process of collective bargaining) carried out in the public interest, as it represents the equivalent of a legal norm contained in another formal source of law, e.g. in a law with the same legal effects.

In addition to the public interest as a legal basis for the processing of personal data, it is possible (especially for trade unions) to use other legal bases, for example, a consent of natural person (employees or members) under Art. 6, par. 1, letter a) of the GDPR (establishment of membership in a trade union, election to trade union bodies or bodies of the employee council, organizing individual or group events by employee representatives, etc.) to perform a contract to which the person concerned is a party or at the request of the person concerned, measures be taken before the conclusion of the contract pursuant to Art. 6, par. 1, letter b) of the GDPR (e.g. activities related to the establishment and exercise of rights arising from membership in a trade union, the implementation of individual or collective employment relationships in the form of trade union contributions), compliance with the legal obligation under Art. 6, par. 1, letter c) of the GDPR (e.g. in the area of fulfillment of obligations related to securing accounting and related documents, processing of applications of affected persons exercising their rights, implementation of individual or collective employment relations, etc.) or legitimate interest of employee representative according to Art. 6, par. 1, letter f) of the GDPR (e.g. processing of contact details, organization of various events for employees and trade union members, etc.).

Table 1: Example of the use of the legal bases in a trade union

Purpose of processing	Legal basis of the processing activity Retention period	Category of beneficiaries
Membership (registration, membership, termination of membership, membership fees, activities of members in connection with their membership)	Public interest, Contract, Consent, Labor Code in connection with Art. 9, par. 2, letter d) Regulations (a civic association processes personal data as part of its legal activities) 5 years after termination of membership or after termination of cooperation (data on persons in regular contact)	Personal data is not provided.
Collective labor relations (strike, legal aid, collective bargaining, health and safety at work, inspections, creation and redistribution of the social fund, overseeing the compliance with the provisions of the Collective Agreement, negotiation related to the termination of employment, fulfillment of rights and obligations)	Legal obligation, Public interest, Agreement, Consent, Collective agreement according to Art. 9, par. 2, letter b) Regulations, the Constitution of the Slovak Republic, Act no. 83/1990 Coll. on Association of Citizens, Act no. 2/1991 Coll. on Collective Bargaining, Act no. 311/2001 Coll. Labor Code, Act no. 84/1990 Coll. on the Right of Assembly Act no. 365/2004 Coll. Anti-discrimination law, Act no.	Employer, Labor Inspectorate, Entities providing cooperation (legal services, other professional assistance)

under the Collective Agreement and other tasks arising directly from legislation or from the Collective Agreement)	124/2006 Coll. on Occupational Safety and Health. In specific cases, consent or explicit consent may be given to the processing of personal data; the data subject will be informed of the conditions for granting consent and processing of personal data before such consent is granted. 5 years after the termination of membership or after the decision enters into force, after the provision of assistance, cooperation, after the end of the inspection, after the provision of the opinion and the like.	
Elections to trade union bodies	Legal obligation, Public interest, Consent, Labor Code, Act no. 83/1990 Coll. on Citizen Associations (internal regulations governing the procedures for elections to bodies in accordance with the Act on Citizen Associations), Consent - the candidate consents to the disclosure of his personal data provided on the ballot. Archived	Employer
Support of leisure time activities (recreational vouchers), participation in children's camps, other types of support and assistance (including financial) to members	Contract, Consent, Contract to which the data subject (IOC member) is one of the contracting parties. In specific cases, consent or express consent may be given to the processing of personal data; the data subject will be informed of the conditions for granting consent and processing of personal data before such consent is granted. 5 years	Employer (in specific cases arising under the Collective Agreement or based on the consent of the person concerned)
Organizing various events, meetings, conferences, activities (sports events, annual conference, ball), including the presentation of activities on the website and social network	Contract, Legitimate interest of the operator, Consent (or express consent). It is in the legitimate interest to organize events and present its activities, in order to motivate employees to join, to reward its members, present results, provide information on activities, etc. In specific cases, consent or explicit consent may be given to the processing of personal data; the data subject will be informed of the conditions for granting consent and processing of personal data before such consent is granted. 5 years	Employer, service provider (e.g. accommodation on booking, transport), organizer of a sporting event, in some cases personal data are published (photo, information on sporting achievements, etc.).
Providing information about activities and important events through a social network (FB - closed group)	Consent. Based on consent, members communicate in a closed group on the social network (FB). Consent is given the moment a request to join a closed group is placed. Consent can be revoked at any time by terminating the group membership. Withdrawal of consent does not affect the lawfulness of the processing of personal data until its revocation. Each member should pay close attention to the setting of their FB profile and set their privacy appropriately, taking into account the nature of the closed group. For the duration of the membership	Social networks
Publishing activity (the union magazine)	Public interest in connection with Act no. 18/2018 Coll. on the Protection of Personal Data (Art. 78), Issuing a magazine in order to inform about the activities of the trade union and important events Archived	Publicly available
Registry management, including recordkeeping system	Public interest, Act no. 395/2002 Coll. on Archives and Registries 10 years	Ministry of the Interior of the Slovak Republic, another authorized entity
Fulfillment of obligations related to the provision of Accounting and related	Legal obligation, Act no. 431/2002 Coll. on Accounting, as amended, Act no. 222/2004	Tax office, auditor, intermediary

documents	Coll. on Value Added Tax, as amended, Act no. 40/1964 Coll. Civil Code, as amended, Act no. 152/1994 Coll. on the Social Fund and on the amendment of Act no. 286/1992 Coll. on Income Taxes, as amended, Act no. 311/2001 Coll. Labor Code, as amended 10 years	
Litigation, out-of-court settlement, distraint, enforcement of legal claims and jurisdictions	Purpose compatible with the original purpose of processing, if under the given processing activity defined in this record of processing activities it is possible to assume the application of legal claims or the defense of the rights of the controller in accordance with the laws: Act no. 162/2015 Coll. Administrative Judicial Code, Act no. 160/2015 Coll. Civil Dispute Order, Art. 9, par. 2, letter c) of the GDPR, if the subject of the application of legal claims is personal data of a special category according to Art. 9 of the GDPR, Act no. 233/1995 Coll. Court Distrainers. 5 years after the end of the proceedings	Parties
Security and protection of property, information, life and health, assets (including network security, security of buildings)	Security and protection of property, information, life and health, assets (including network security, security of buildings) 1 year	Not provided.
Handling of complaints, suggestions related to the statutes	Public interest, consent (membership), Labor Code 5 years after the end of the investigation	Participants
Contact details	Legitimate interest. It is in the legitimate interest of the operator to process contact details of entities with which he maintains communication, has business relations, etc.. For the duration of the contractual relationship, for the period of validity of the said contact details	Parties, participants
Handling and registration of exercised rights of affected persons	Legal obligation, According to the Chapter III of Regulation 2016/679 on the protection of individuals with regard to the processing of personal data and on the free movement of such data 5 years	Natural persons exercising the rights of the persons concerned

4 Conclusion

The appropriate legal basis for the processing of personal data must be based on the nature of the employee representative at the workplace. In the case of a trade union, personal data of a special category will be processed - trade union affiliation. The policy adopted shall also take into account activities carried out by employee representatives internally and in connection with third parties, taking into account possible activities which the trade union might implement. Notwithstanding this premise, however, we consider choosing the public interest as a go-to legal basis to be an option that provides employee representatives with a new approach, especially in managing internal affairs related to the personal data processing. Based on the above legal arguments and with reference to the legal regime of the supranational legislation of the International Labor Organization, the use of the public interest in specific processing operations is justified, proportionate or even desirable. However, employee representatives must have a corresponding document prepared in this regard which would implement the requirements of the GDPR Regulation. However, it is also required to pay attention to situations where the premise of public interest in personal data processing operation is not justified. In such cases the consent of the natural person concerned is required.

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EDUCATIONAL INFLUENCE OF PARENTS IN CONTEMPORARY FAMILIES

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The present paper is a partial output of the research project KEGA no. 007UKF-4/2020 "The Topic of the Family in the System of Teacher Training".

Abstract: We perceive the family as a social institution that fulfills important social functions, which undoubtedly include an educational function. However, concerning the impact of socio-economic conditions, cultural changes as well as the impact of other cultures, the educational activities in contemporary families are changing. The study deals with the research focused on determining the educational influence of current parents. Parents from different regions of Slovakia took part in the research. The research results were processed using the descriptive statistics methods and the Student t-test was used for the purpose of comparison. Based on obtained results it may be stated that current parents are perceived as quite liberal, without setting limits and clear rules in raising their children, and with a tendency to excuse children's mistakes. Their raising is marked by high pressure on children's school performance while they attribute the responsibility for school results and education to school.

Keywords: family, social changes, parents, child, education

Introduction

The family is a universal social group, in which important processes of socialization and education of each individual take place. The educational importance of the family is emphasized by many publications written by teachers, psychologists, sociologists and doctors. They point to the fact that the family environment shapes specific traits in each individual and its influence is far-reaching and diverse. Authors (e.g. Kurincová, 2005; Švaříčková Slabáková, Sobotková, 2018; Berežnicka, 2014; Capaldi, 2019) emphasize the importance of the family from several aspects of its influence: from the point of view of primary education; provision of socially desirable values, standards and their interiorization; the formation of behavior models and identification with identification patterns as well as from the point of view of acquiring forms of verbal and non-verbal communication; forming emotional relationships etc. The irreplaceability and primariness of the family's educational influence is an immutable fact, but under the influence of social changes, the raising of children in contemporary families is changing.

1 Changes in the society and in the family

The changes that society has been going through in recent decades affect the life of families, their structure, functioning, relationships, as well as the sphere of parents' educational activities. In principle, it can be stated that the processes of social changes have an impact on families and the social changes in families have the impact on society.

Contemporary society is accompanied by globalization, which causes the expansion of individual freedom, the development of communication technologies, the expansion of opportunities for mobility, education, and existence (Somlai, Tóth, 2002). There is more and more individualization, depersonalization of relationships, sharp rationalization, and the increase of demands (Kraus, 2015). According to Kraus (2015, p. 19), contemporary society is mainly characterized by two moments: individualism and dynamism. Individualism can be understood as "breaking free from the shackles of traditions, historically sold customs and obligations" (Helus, 2007, p. 139), as "a gradual transition from given relationships, prioritized by the origin of a person to predominantly chosen relationships, formed by the free choice of the individual" (Guráň, Filadelfiová, Ritomský, 1997, pp. 5-6). According to Bacenkova, Sushhenko (2018, p. 88), "on the one hand, the individualization of society expanded the autonomous space for the activities of individuals (opportunities for education, independent decision-making, realization of one's own potential, constant self-improvement), on the other hand, it

deformed the sphere of marriage and family life, because the individual became free from the traditional norms of the family". According to Mastalski (2015), individualism dangerously creeps into the family lives, causes the decision-making only in one's own intentions, leads to tension and misunderstandings. Today, we notice elements of family individualism, which is manifested in a lack of communication, reluctance to tolerate the needs of other household members, a selfish approach to fulfilling one's needs, the perception of oneself as a "family hero", the need to achieve success and new experiences even at the expense of the family. The dynamism, which is an accompanying phenomenon of transforming society in recent decades, leads to the acceleration of society, but also of the individual. As a result, the family becomes more open, more accessible, more adaptable to changes brought by the development of society, but also to changes in individual human development (Guráň, Filadelfiová, Ritomský, 1997, pp. 5-6).

According to several authors (Ondrejko, Majerčíková, 2006; Somlai, 2013; Horvát, Džambazovič, 2015; Beck, Beck-Gernsheim, 2016; Ganesini, Blair, 2016), the economic and cultural transformation of society causes the accelerating changes in the family lives observed in recent decades. Changes in society lead to the destruction of forms of family coexistence, to changes in the family value systems, to loosening of mutual relations, to doubt about the importance of marriage and family, and to the diversification of life possibilities. As Kraus (2015, p. 13) states, "the contemporary family is inconsistent, the relationships are unclear, with frequently changing constellations, often producing feelings of powerlessness." Because the family is a living, constantly evolving social institution, its transformation processes are also reflected in the educational activities of parents.

2 Education in contemporary family

The comparison of parenting shows that it has never been as complicated as it is today. Its complexity follows, as Brezinka (1996, p. 134) states, from the fact that "we live and educate in the era of cultural liberalism, i.e., in the age of diversity of ideals and value attitudes". Medne (2009) adds that the current child upbringing is more demanding than in the past since a certain period and has been replaced by distorted values and emotionally cold relationships.

Each historical period has its own specific social and economic conditions, which also influence the ideas about the education goals and the requirements that children must meet. "In the past, the education goal was to raise an "obedient and decent" child, while obedience meant complete and immediate compliance with parental demands. The goal of today's parenting is "a happy, self-confident and independent child". So that a "unique" personality will grow, that can "establish himself well" in life (Lacinová, Škrdlíková, 2008).

Contemporary forms of parent-child relations are different, more free and we find the elements of liberalism and anti-authoritarianism. According to Liu (2016, p. 122), "the present generation of children has experienced a democratization of the parent-child relationship, which has manifested in a transformation from respect and obedience to free communication." Manniová (2007) writes about modern educational activities, i.e., about anti-authoritarian upbringing in the family, which can lead to the loss of parental authority. The child's opinion has the same value as the parent's one. The above mentioned principles of loose upbringing have negative effect on the child's psychophysical condition, communication, education, emotional relationships and ultimately, they determine the child's life in the future.

Nowadays, the education in families is often marked by the lack of time that parents devote to their children. The reasons may arise either from their employment or from other social and

cultural interests, as the interest of the child is relegated to a secondary place. The problem is not only that parents do not have enough time for their children, but they often do not even know what their children do in their free time and are often not even interested in it (Przygońska, 2011; Njufeld, Mate, 2018).

The education of today's children is often characterized by high parental pressure on children's school performance (Karbach et al., 2013; Ochojska, Marmola, Wańczyk-Welc, 2017; Ponukalina, 2020). It is typical, as stated by Helus (2007), that parents constantly put more pressure on their children to deliver high performances, to show perfect results or to be always better than others. Parents have high demands on their children, they are focused too much on the child's success and later social prestige. High parental expectations connected with the educational path of the child are currently also determined by the pressure of society. Success stands on a public pedestal, which promises a guarantee of successful life. Parents are under pressure to demand performance from their children, to pay attention to education, because otherwise the children will not find employment, "they will not be well". The school is understood as the key to a good future.

3 Research - Education of current parents

3.1 The project of the research

Based on the currently ongoing changes in the family lives outlined above, including changes in the field of family education, we focused on finding out the parents' opinions regarding the education of current parents. In the context of research problem, we focused on three selected aspects of contemporary parenting: 1. parents' characteristics, 2. parents' relationship to the child's school results, 3. parents' educational practices. *The aim* of the research was:

1. to map the parents' opinions on selected aspects of raising of current parents,
2. to find out whether parental education level determines their opinions on family education.

We set following research questions:

- How do respondents evaluate current parents: are they strict or rather liberal? Tolerant or rather critical?
- Is it important for parents that their children achieve good results in school?
- What educational procedures do they apply when raising their children? Do we find elements of liberalism or rather democracy and authoritarianism there?
- Are there differences in the opinions of the respondents regarding the current education in the family due to their level of education?

The research sample consisted of 205 parents from different regions of Slovakia who had at least 1 child. To obtain the research data, we used a non-standardized questionnaire. The questionnaire involved bipolar scales that contained opposite adjectives at the extreme points. The questionnaire also contained Likert scales for measuring the respondents' attitudes and opinions with the aim to specify their level of agreement or disagreement with the given statements on a 5-degree scale: 1 - I totally agree, 2 - I rather agree, 3 - I cannot express myself, 4 - I rather disagree, 5 - I totally disagree.

The results obtained by the questionnaire method, we evaluated by using descriptive statistical methods: number, average, percentages, standard deviation. For comparison purposes Student t-test was used.

3.2 The analysis of the research results

In the context of the above-mentioned research objectives, we investigated parents' opinions on education in contemporary families. At the same time, we verified whether the opinions of

the respondents (parents) are significantly different regarding their education on the statements presented by us.

The first group of questions was formulated in the form of bipolar scales with opposite adjectives on both sides of the scale, on a scale from 1 to 5 (1 – very, 2 – rather, 3 – undecided, 4 – quite, 5 – very). Our intention was to find out how respondents evaluate current parents, what qualities they attribute to them. If the qualities related to liberal and democratic, or rather to authoritative education.

Table 1 Characteristics of parents – all respondents

Characteristics of parents Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Most parents today are strict/ liberal	205	2.0	5.0	4.054	.7290
Most parents today are tolerant / critical	205	1.0	5.0	3.327	1.1697

Table 1 shows that the respondents characterized the parents as quite liberal (value on the scale 4.054), but with an ambivalent, ambiguous evaluation of the qualities: tolerant/critical (value on the scale 3.327). We can state that this finding corresponds to the practice of family education, where current parents are relatively liberal in the upbringing of their children and equally tolerant and critical towards their children.

We tested the statistical significance of the differences between two groups of respondents (parents with the highest secondary education and those with university education) in the answers on two bipolar scales. The results are in Table 2 (statistically significant differences are marked *) and it follows that the differences between the respondents' opinions regarding their education were statistically significantly different when evaluating the strict/liberal characteristics. Parents with university education attributed more liberality in parenting to parents than those with primary and secondary education. When evaluating the tolerant/critical qualities, there were no statistically significant differences in the respondents' opinions regarding their education.

Table 2 Characteristics of parents - respondents according to

Characteristics of parents according to respondents' education		N	Mean	Std. Deviation	Std. Error Mean
Descriptive Statistics					
Most parents today are strict / liberal	primary and secondary	91	3.923*	.7635	.0800
	university	114	4.158*	.6859	.0642
Most parents today are tolerant / critical	primary and secondary	91	3.308	1.1224	.1177
	university	114	3.342	1.2108	.1134

The second group of questions, formulated in the form of Likert scales, was aimed at finding the parenting practices. In the previous question, the parents were rated as rather liberal, so we researched how their liberal parenting style is presented. The Likert scale contained five levels (1 - completely agree, 2 - rather agree, 3 - I can't express, 4 - rather disagree, 5 - completely disagree) and our aim was to find what are the expressions of liberal upbringing of current parents. We found out the respondents' opinions through statements (no. 1 - 7), average values are in Table 3.

Table 3 Parents' educational practices – all respondents

Statements/ Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
1. Parents allow their children a lot, they do not set boundaries, clear rules.	205	1.0	5.0	2.000	1.0479
2. They tend to do everything for the children so they can have peace of mind.	205	1.0	5.0	2.220	1.1655
3. They give their children fewer responsibilities than the previous generation of parents.	205	1.0	5.0	1.541	.8428

4. They tend to justify some manifestations of children's behavior.	205	1.0	5.0	1.737	.9123
5. Parents are inconsistent, they do not require compliance with rules.	205	1.0	5.0	2.171	1.1355
6. They don't have enough patience to raise more children.	205	1.0	5.0	1.995	1.0869
7. The upbringing is warm, but much more free.	205	1.0	5.0	1.893	.8622

We also tested the statistical significance of the respondents' differences in their opinions on the statements regarding their education, but statistically significant differences did not appear. As shown in Table 3, the respondents, regardless to their level of education, rate the upbringing of their current parents as liberal. The respondents rather agreed that current parents do not set clear rules for their children, tend to give them fewer responsibilities, and justify their undesirable behavior. At the same time, we found that because of the release of educational principles, upbringing is more based on the emotional relationship. However, it is also looser and inconsistent, that weakens the existence of clear rules and principles in the family. Based on the results, we can conclude that parents take the initiative instead of children, in the fulfillment of household and school duties.

The third group of questions, also formulated in the form of Likert scales, focused on parents' relationship children's school performance. The Likert scale contained five levels (1 – completely agree, 2 – rather agree, 3 – cannot express myself, 4 – rather disagree, 5 – completely disagree). Our aim was to find out what importance respondents (current parents) assign to their children's school success, whether parents require good school results from their children and whether responsibility for the children's success assign to school. The respondents' opinions we found through statements (No. 8-11), their average values on a scale from 1 to 5 are presented in Table 4.

Table 4 Parents and children's school results – all respondents

Statements / Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
8. They require excellent academic results from children.	205	1.0	5.0	1.868	.9586
9. They transfer educational responsibility to school.	205	1.0	5.0	2.127	1.2060
10. They try to make schoolwork easier for children.	205	1.0	5.0	2.210	1.0146
11. They are very focused on the child's success and later social prestige.	205	1.0	5.0	1.888	.9762

Based on the results in Table 4, we can conclude that the respondents partially agreed with all the statements regarding the children's school results. Above mentioned average values (range between 1.868 and 2.210) show that nowadays the raising children is characterized by high pressure from parents on their school performance (statement no. 1 and no. 3). Concerning this goal, parents try to make schoolwork easier, e.g., help with home preparation for lessons (statement no. 3). At the same time, our findings show that parents assign the responsibility for children's school success mainly to school (statement no. 2).

Moreover, we tested the statistical significance of the respondents' differences in their opinions regarding their education level. Based on the results shown in Table 5, we can conclude that the respondents evaluated statistically significantly different statements no. 3 and 4 (marked in Table 5 *), but without statistical difference statements no. 1 and no. 2. Parents with university education expressed greater extent of agreement with the statement "They are very focused on the child's success and later social prestige" than parents with lower education. Based on this data, we can conclude that university-educated parents prefer the value of success to a greater extent, which is related to their higher expectations for their children's education,

they have a higher motivation to stimulate their children in education.

Table 5 Parents and school results - respondents according to education

Statements/ Descriptive Statistics	N	Mean	Std. Deviation	Std. Error Mean	
They require excellent academic results from children.	primary and secondary	91	1.846	1.0102	.1059
	university	114	1.886	.9194	.0861
They transfer educational responsibility to school.	primary and secondary	91	2.121	1.2278	.1287
	university	114	2.132	1.1937	.1118
They try to make schoolwork easier for children.	primary and secondary	91	2.385*	1.1621	.1218
	university	114	2.070*	.8593	.0805
They are set up for the child's success and later social prestige.	primary and secondary	91	2.044*	1.0101	.1059
	university	114	1.763*	.9341	.0875

4 Discussion and conclusions

In the presented study, we focused on the issue of raising current parents in the context of changing aspects of current family lives. With the rapid development of science, technology, but also consumer life, the family is turning into a post-modern one with new features, but with the ongoing full responsibility for raising the child. As we mentioned, the patterns of parent-child relationship have changed. Authoritative education is less widespread, at the expense of the expanding tolerant, liberal style of education.

This fact was also confirmed by the findings of our research, which showed that current parents are rated as quite liberal, who do not set clear rules for their children, or they don't require compliance. Parents are more tolerant to children, they tend to justify their undesirable behavior, perform their duties instead of them. The mentioned educational procedures are probably related to the acceleration of liberalism in society, in moral values, standards, but also to the lack of time and patience of parents, to the limited interventions of other people in the upbringing of the child, as well as to the efforts of parents to shift parental responsibilities to institutions outside the family (especially to school).

Our findings correspond with the findings of Kasáčová et al. (2017), according to which current parenting is characterized by excessive benevolence and not setting boundaries. The modern values of society determined the increase in accommodating and inconsistent education without rules. As Rabušic, Kusá, Rabušicová (2019) write, the child's obedience has been replaced by its own autonomy and independence. The principles of free governance indicate the dominance of liberal education, but liberal education has its limitations. According to Kasáčová et al. (2017) the child does not master the prosocial rules of behavior and action, is more prone to pathological behavior, has problems with respect for authority and self-regulation of behavior. Lacinová, Škrdlíková (2008, p. 23) state that this is a trend that shifts the emphasis from demanding obedience to the word rather, to an appeal for the perception of the child as a unique and respected human being. Paradoxically, if the difficulties with upbringing are discussed today, parents often express doubts about the relationship of children to authorities and talk about the children's inability to listen and their impaired adaptation to the demands of the surrounding world.

Our research also confirmed that, despite the liberality of family education, the importance of a child's school success resonates in the respondents' opinions. From the respondents' opinion, it emerged that parents demand good school results from their children, and school is understood as the key to a good future. This pressure has recently intensified, because a decisive condition for good social employment is quality education in the

future. Parents often expect good school performance, but a mismatch between parental and the child's expectations can lead to adverse effects on the child's mental health. At the same time, the parents' ambition to compensate for their own failures through their children, or unfulfilled goals is also a wrong approach.

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COMPARISON OF THE TEACHERS PROFESSIONAL DEVELOPMENT SYSTEM IN SLOVAKIA AND HUNGARY

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Abstract: The main thrust of teacher professional development, which is based on the philosophy of professional renewal and lifelong learning. The concept of lifelong learning (LLL) has triggered major changes in the approach to education and training policy in all developed countries. The study focuses on the system of continuing professional development of teachers in Slovakia and Hungary, analysing its similarities and differences in the existing legislation. Its aim is to critically compare the current system of teachers continuing professional development in Slovakia and Hungary on the basis of qualitative content analysis and using the analytical strategy of constant comparison. The research shows that there are similarities and differences in the teachers continuing professional development systems in Hungary and Slovakia, which have an impact on the formation of teachers' professional competences and that the data obtained can serve as an inspiration for the further development of the teachers continuing professional development systems in each country.

Keywords: Hungary, teachers continuing professional development systems, Slovakia

1 Introduction

The knowledge acquired in the course of obtaining a qualification needs to be supplemented and deepened over time, which implies innovation in education systems. In agreement with Óhidy (2006), this automatically generates the concept of developing in people the need to learn as a skill, as a response to changes in their environment. The birth of the concept of lifelong learning itself is linked to the 1970 UNESCO conference. Later on, the concept was taken up by the European Council, the OECD and the European Commission and gradually became a pedagogical paradigm.

The European Union's education policy principles increasingly emphasise the role of lifelong learning. The idea of lifelong learning has thus become one of the most important pedagogical paradigms in Europe in recent decades. At the start of the new millennium, several international organisations and governments have identified lifelong learning as the driving strategy for education policy in the new era. In the course of numerous analyses and interpretations of social change and development, many experts have concluded that a paradigm shift in traditional educational design is needed. As Coolahan (2002) points out, the new paradigm must ensure that lifelong learning policies are applied to meet the new challenges of a significantly changed civilization.

According to the European Commission (2001), lifelong learning is defined as any learning activity undertaken throughout life with the aim of developing knowledge, skills and competences from an individual, civic/civil, social and/or employment perspective. It includes all levels of learning, sets of knowledge and skills acquired through formal learning, informal learning and non-formal learning (Dunn, 2003; Kasáčová, 2004). The main objective of the Lifelong Learning Strategy (European Commission, 2021) is to complete the system of lifelong learning and lifelong guidance (Lifelong learning strategy, 2020). Lifelong learning is closely linked to adult learning. While school education is compulsory for the child, adult learning is largely self-initiated/determined. And personal intrinsic motivation is an essential part of lifelong learning. Sometimes it is the desire to learn that leads to training, sometimes it is the constant changes in the world, but the aim is always to acquire new knowledge, skills and abilities (Óhidy, 2006).

According to Duță and Rafailă (2014) lifelong learning can be broadly defined as learning that is flexible, varied and available

at different times and places. Lifelong learning supports learning across sectors, beyond traditional schooling and throughout adulthood (i.e. after compulsory schooling). This definition is based on Delor's (1996) four 'pillars' on which education for the future is:

- Learning to know: mastering learning tools rather than acquisition of structured knowledge.
- Learning to do: equipping people for the types of work needed now and in the future including innovation and adaptation of learning to future work environments.
- Learning to live together, and with others: peacefully resolving conflict, discovering other people and their cultures, fostering community capability, capacity and individual competence, economic resilience, and social inclusion and economic resilience.
- Learning to be: education contributing to a person's complete development: mind and body, sensitivity, intelligence, aesthetic appreciation and spirituality.

The philosophy of lifelong learning is also at the heart of the main thrust of teacher professional development, which is professional renewal. We are aware that the concept of lifelong learning has triggered major changes in the approach to education and training policy in all developed countries. And these changes have had (and continue to have) an impact on the shaping and implementation of professional development systems for teachers. It should be noted that the lifelong learning strategy is an integral part of the education policy of each EU Member State and the starting point of the teachers continuing professional development systems. It defines the direction and principles of the professional development system, which are then translated into concrete actions in the form of laws and regulations on teacher training. Participation in teacher training is both an opportunity (it is up to the teacher to decide when and what to study) and an obligation. However, the extent of the obligations usually varies from country to country.

According to Pavlov (2007), the teachers continuing professional development provides the conditions for the gradual change of teacher competences during professional development. Furthermore, he highlights that continuing professional development fulfils adaptive, motivational, developmental, innovative and reflective functions.

In adapting the EU's multidisciplinary approach to lifelong learning, the EU Member States are not adapting their (education) policies, institutions and their structures mechanically, i.e. not by simply adopting EU standards, but always by taking into account their own national interests (Óhidy, 2021). In most countries, it is generally accepted that teachers should continuously update their knowledge, skills and competences. As CEDEFOP (2016) reports, in some countries, teacher professional development has even become part of strategic priorities, such as Bulgaria, Croatia, the Czech Republic, Latvia, Malta, the Netherlands, Norway, Poland, Romania.

Experts agree that society's demand for a highly educated, well-trained, committed and effective teaching force has never been more urgent than it is today. At the same time, it is clear that lifelong learning is now placed at the centre of an intense policy debate (Finstrewald et al., 2013). Teaching careers are placed in the context of the changing policy paradigm of lifelong learning. It is also recognised that while the demands on teachers are increasing significantly, there are worrying signs that in some countries the key factors needed to support a quality teaching profession are under pressure. Coolahan (2002) is of the view that there is a need for a systematic and coherent policy on the part of the state to support teaching careers. He highlights that a robust and comprehensive policy supporting teaching careers must be a priority for governments and that policy formulation

and implementation should be undertaken by policy makers in consultation with the teaching community. PISOŇOVÁ (2017) concurs, arguing that teachers continuing professional development should be guided by the interests of educators, the needs of the school system, and should also take into account innovative trends in pedagogy.

Based on these theoretical starting points, we wanted to compare the domestic teachers continuing professional development with that of a country with a similar political-economic status, a member of the EU and the V4, with a similar socio-cultural background and influenced by similar social and cultural factors. We wanted to see how the lifelong learning strategy is reflected in the education and training policies of these countries and what specific characteristics are found. The study therefore focuses on the continuing professional development of teachers in Slovakia and Hungary, examining its similarities and differences on a theoretical level. The aim is to provide a comparative analysis (using content analysis) and thus to compare the current system of professional development for teachers in Slovakia and Hungary. In doing so, to point out specificities that can serve as inspiration.

2 Research sample and research methods

The subject of our qualitative research was the teachers continuing professional development system in Slovakia and Hungary, respectively their identities and differences enshrined in the legislative documents of these countries. In order to clarify the subject of our research, the legislative documents represent our research sample. In relation to our research, these documents were relevant in fulfilling the aim of the research, i.e. to identify the identities and differences in the legislatively established continuing professional development of teachers in two V4 countries - the Slovak Republic and Hungary. The legislative documents that we worked with, are the so-called ready-made documents, which as GAVORA (2015) says, were created outside the researcher's activity. The latter only takes them over and analyses them. The legislative documents were subject to qualitative content analysis of the text, so their selection was carried out by non-stochastic (MASON, 2018), intentional selection. We selected the documents based on predetermined criteria that are directly related to the subject of our research. The finished legislative materials that were relevant to our research needs were:

- *Legislative documents of Slovak Republic:*
 - Act No. 138/2019 Coll., the Act on Teaching and Professional Employees and on Amendments and Additions to Certain Acts, as amended,
 - Decree No. 361/2019 Coll., Decree of the Ministry of Education, Science, Research and Sport of the Slovak Republic on education in professional development,
 - Act No. 568/2009 Coll., the Act on Lifelong Learning and on Amendments and Additions to Certain Acts,
- *Legislative documents of Hungary:*
 - Government Decree 277/1997 (XII. 22.) on teacher training, the teacher qualification examination, and the allowances and benefits of participants in further training,
 - Government Decree No. 326/2013 (VIII. 30.) on the implementation of Act XXXIII of 1992 on the promotion system of teachers and the status of public servants in public education institutions,
 - Act CXC of 2011 on National Public Education.

As mentioned earlier the method of research data collection was qualitative content analysis of the text. Content analysis of text is an important research method that subjects the communication that constitutes the research data set to analysis (GLÄZER - ZIKUDA et al. 2020). The researcher subjects the text to analysis from different perspectives, extracting content from the text, whether overt or covert (HENDL, 2016). In our particular research, we analysed latent, i.e. hidden, content, applying an inductive method of content analysis of text - a progression from textual material to new theory (SILVERMAN, 2015) - to obtain qualitative data. We subjected the above legislative documents to this

analysis, where we condensed the input text into meaning categories. The qualitative data thus obtained was subjected to evaluation by means of open text coding, where we assigned codes - phrases - according to their internal contexts. The following codes emerged - Nature of the legislation, Consistency with the concept of lifelong learning, Institutions competent to provide the teachers continuing professional development, Teacher career paths, Types of teacher professional development, Rights and obligations of teachers, Funding of professional development, Financial allowances based on participation in professional development. We then proceeded to their interpretation, in which we used a technique called card layout (SKUTIL et al., 2011), where we constructed a new text that clarifies the content of each code. We would state that we carried out the above research steps for the legislative documents of the Slovak Republic and Hungary separately. However, due to the fulfilment of the research objective, at the end of our research work we proceeded to apply the analytical strategy of constant comparison (ŠVARÍČEK, ŠEĎOVÁ, et al. 2007), which allowed us to develop a new theory in the form of determining the similarities and differences in the legislatively established system of teacher education in two V4 countries - the Slovak Republic and Hungary.

3 The study results and discussion

In this chapter we will present and analyse in parallel the teachers continuing professional development in Hungary and Slovakia: we will examine their similarities and differences on the basis of the criteria set up.

Nature of the legislation

In Slovakia, the legislation in force is Act 138/2019 on pedagogical and professional staff, which regulates the work of pedagogical and professional staff, their professional development, the monitoring of their professional development, administrative offences and the central register of pedagogical and professional and other staff of schools and school establishments. The first part deals with the rights and duties of teachers. The second part describes the duties of teachers and professional staff. It sets out the prerequisites for employment and the qualifications required. Articles 3 and 4 of the Act deal with the continuing professional development of teachers. It stipulates that teachers working in regional education (nursery, primary, secondary, art, language and special needs schools and schools for children with special educational needs) have the right to in-service training. Article 3 (§ 40-70) deals with the definition of the term 'continuing vocational training' and describes the types of training, the possibilities for funding them and the powers of the competent organisations and institutions. It stresses that professional development may take the form of continuing training, creative activity, self-training and the completion of a professional placement aimed at renewing professional competences. Article 4 (§71-75) deals with controls and infringements relating to continuing training (Zákon č. 138/2019 Z. z. o pedagogických zamestnancoch a odborných zamestnancoch a o zmene a doplnení niektorých zákonov v znení neskorších predpisov, 2019).

Further legal regulation is the Decree 361/2019 of the Ministry of Education on the in-service training and professional development of teachers, which clarifies certain points of the above-mentioned law. It defines the detailed training programme for the forms of professional development and the modules of the programme. It specifies what the training programmes must contain, including the type, scope, form, objectives, etc. It details the content and scope requirements for each form of continuing training, which ensure the quality of the training. It lists the criteria determining the suitability of organisations providing continuing training. (Vyhláška č. 361/2019 Z. z. Vyhláška Ministerstva školstva, vedy, výskumu a športu Slovenskej republiky o vzdelávaní v profesijnom rozvoji, 2019). The Regulation entered into force on 15 October 2019.

The current law in force in Hungary is Act CXC of 2011 on National Public Education, which has undergone several amendments since its entry into force. Point 17 of the Act provides for the support and organisation of training, further training and self-training of teachers within the framework of pedagogical - professional services.

The teacher's career model is regulated by Government Decree No 326/2013 (VIII. 30.) on the career system of teachers and Act XXXIII of 1992 on the status of public servants. The Decree sets out the rights and duties of teachers, detailing the obligations for further training, the requirements for the grading of teachers, the requirements and conditions for advancement to a higher grade, and the conditions for professional practice and the qualifying examination (326/2013. (VIII. 30.) Kormányrendelet a pedagógusok előmeneteli rendszeréről, 1992). The legislation emphasises that continuing vocational training may take the following forms: formal, informal, non-formal, in-school and out-of-school, formal, informal, non-formal; degree courses established and organised by the teacher training faculty of a higher education institution; further specialisation, specialisation courses, examination courses; training and self-training services provided by professional services: accredited courses, short training courses and self-training: study of educational libraries and databases, in-service training, etc.

Consistency with the concept of lifelong learning

In Slovakia, the law and the regulation are in line with the Lifelong Learning Act 568/2009, which includes in the concept of lifelong learning all activities throughout our lives that aim to improve knowledge, skills and abilities. It is based on the principle of continuing training beyond the level of education attained at school. It is worth mentioning the specificity that, since 2008, the term 'school' has also been used to refer to kindergartens under the Public Education Act 245/2008 (Zákon č. 245/2008 Z. z. o výchove a vzdelávaní (školský zákon) a o zmene a doplnení niektorých zákonov).

Law 568/2009 on Lifelong Learning defines the following types of continuing education in Slovakia:

- continuing education in an accredited training programme leading to the addition, renewal, extension or updating of the qualifications required to pursue a professional activity,
- retraining in an accredited training programme leading to a partial qualification or a full qualification - professional competence in one or more professional activities other than those for which the qualification was obtained by school education,
- continuous training in educational programmes in which the participant complements, extends, deepens or renews his/her qualifications in accordance with specific requirements,
- hobby education, civic education, education for the elderly and other education through which the learner satisfies his or her interests, participates in civil society and develops his or her personality (Zákon č. 568/2009 Z. z. o celoživotnom vzdelávaní a o zmene a doplnení niektorých zákonov).

The main objective of the Lifelong Learning Strategy in Slovakia is to ensure lifelong learning and to develop a system of lifelong guidance (Stratégia celoživotného vzdelávania, 2021). The functional system should facilitate the flexible acquisition of new knowledge, skills and competences through quality education for all citizens, regardless of their current life situation. The Lifelong Learning Strategy was adopted by the Government in 2011 in its Decision 657/2011.

In the Slovak Republic, the Ministry of Education, Science, Research and Sport, as the central state administration body responsible for ensuring lifelong learning, has developed the Lifelong Learning Action Plan, which contains concrete measures to help put the theoretical aspects of the Lifelong Learning Strategy into practice. The Action Plan outlines the vision in four main priority areas: 1) providing attractive lifelong learning; 2) providing education relevant to the labour market

and employment; 3) providing accessible guidance services; 4) providing access to lifelong learning (Akčný plán stratégie celoživotného vzdelávania, 2011). Following the 2011 Action Plan, a new document was developed in 2021 - Lifelong Learning and Guidance Strategy for 2021-2030 (2021), which defines the following principles of lifelong learning in Slovakia:

1. Ensuring lifelong access for every citizen to opportunities to improve and maintain skills.
2. Increasing the flexibility of formal education, building a flexible and open system of learning pathways and an effective adult education system.
3. Increasing access to learning opportunities and individualised support for learners.
4. Increasing inter-ministerial cooperation and coordination and applying participatory and innovative solutions with the involvement of Lifelong Learning actors.
5. Building evidence by collecting data and conducting research with a focus on LL for informed decision making and skills system management (tracking graduates, collecting data on VD participants, analysing barriers).

In Hungary, the concept of lifelong learning itself is set out in the document "Strategy for the Long-term Development of Hungarian Public Education" (Harangi, 2003), which includes concepts for public education and adult education. Such concepts include, for example, the adaptation of the education system to the principles of lifelong learning and the creation of opportunities for learning outside the formal learning environment. At the heart of the strategy itself is the creation and provision of lifelong skills and competence development and the creation and dissemination of the necessary opportunities and demand for it. The framework strategy addresses the following themes:

- lifelong learning;
- increasing adaptation to the needs of the learner;
- stimulating motivation to learn, providing second chances;
- developing skills and competences appropriate to needs and age-related characteristics;
- seeking a balance between learning opportunities and learning needs;
- promoting a new learning and innovative pedagogical culture.

The overarching objectives of the framework strategy are therefore to increase participation in lifelong learning by improving access, to strengthen the principles of public education and adult learning, and to develop transparent and recognised learning outcomes and values (European Commission, 2022). Main functions according to the European Commission (2022):

1. Supporting the acquisition of initial education/training and/or vocational qualifications that are necessary for the individual's career.)
2. Support for the acquisition of continuing vocational training and/or higher vocational qualifications (continuing vocational training).
3. Training for employment. This includes retraining and further training.
4. Supplementary training to support the effectiveness of vocational training, job search, more effective work.

Institutions competent to provide the teachers continuing professional development

In Slovakia, the teachers continuing professional development is organised with the approval of the Ministry of Education, Science, Research and Sport of the Slovak Republic. Training courses, with the exception of adaptation training, must be accredited. The implementation of training requires the approval of the Ministry, which must approve the specific training programme. The law requires that the application for a continuing training programme or a module thereof must be submitted in writing to the Minister of Education and that

approval may be obtained for a period of 5 years (Zákon č. 138/2019 Z. z. o pedagogických zamestnancoch a odborných zamestnancoch a o zmene a doplnení niektorých zákonov).

The following institutions are competent to accredit and implement training courses: the state institution designated for this purpose by the state - an organisation established by the Ministry to ensure and fulfil the necessary tasks in the field of continuous training (until 2022 MPC - Methodological and Pedagogical Centre, from summer 2022 NIVAM - National Institute of Education and Youth), universities and colleges, church or religious associations, institutions for continuing education: civil organisations and other legal entities - whose object of business includes training activities.

In Hungary, the Government Decree 277/1997 specifies the conditions for the regulation of the programme of teacher professional development determines the validity, content and requirements of the programme, approved by the Education Office. The Education Office keeps a register of those authorised to organise teacher professional development courses. The organisers shall be required to draw up a list of approved training programmes. Among the bodies authorised to organise continuing training are colleges, universities, college and university departments, and the pedagogical training centres of the Education Office, with 15 seats. The Office decides on the eligibility to organise continuing training and on the granting of the necessary authorisation to establish such training on the basis of a proposal from the Accreditation Board for Continuing Teacher Education (277/1997. (XII. 22.) Korm. rendelet a pedagógus-továbbképzésről, a pedagógus-szakvizsgáról, valamint a továbbképzésben részt vevők juttatásairól és kedvezményeiről).

Teacher career profiles

In both countries, they play an important role in the completion of a course, as certain courses require a qualification in a particular career path.

In Slovakia, the law provides for the following classification:

- Beginning teacher: on the first day of employment (within 5 days), the teacher starts adaptation training under the guidance of a mentor teacher. The adaptation training will normally last for one year, up to a maximum of two years. It ends with a presentation and a final interview in front of a 3-member panel.
- Independent teacher: on completion of the adaptation training, the teacher becomes an independent teacher.
- First teacher with attestation: the first attestation can be completed after five years of teaching practice. It is completed by a portfolio defence and an examination.
- Second attestation: the second attestation may be obtained after a further five years of professional practice. It concludes with the defence of a portfolio and an examination. The second attestation is equivalent to the award of a third degree (PhD) for the purposes of classification in the pathways (not otherwise) (Zákon č.138/2019 o pedagogických zamestnancoch a odborných zamestnancoch a o zmene a doplnení niektorých zákonov).

In Hungary, the available career paths for teachers are as follows:

- Trainee I: teachers with less than two years' professional experience. The teacher must have a 'pass' mark in a qualification examination in order to progress to the Teacher I level. The qualification is based on the analysis and evaluation of two sessions and an assessment of the teacher's portfolio.
- Teacher I: A rating obtained in the traineeship examination.
- Teacher II: teachers who have nine years' experience in teacher I and have passed the qualifying examination may enter this category. The assessment includes a portfolio of previous professional experience, a portfolio defence, an

evaluation of a teaching session, an institutional self-evaluation, a national pedagogical-professional audit, a summative evaluation.

- Master teacher: after six years of professional experience at the level of teacher II and a successful teacher qualification examination, a teacher may be placed in this category. The Master teacher is involved in the professional management of the trainee teacher, in various research and development activities, in the organisation of in-service training, and in the preparation of the trainee teacher for national or international academic, professional, artistic and sporting competitions.
- Research teacher: to enter this category, a research degree in a field related to the education and professional qualifications, a university degree (Dr. univ.), regular professional publications and fourteen years of professional experience are required (Simonics, 2016).

Types of the teacher professional development

In Slovakia, the following types of teacher professional development are distinguished:

- qualification training to obtain a new pedagogical qualification (qualification), or to obtain a (special) teacher qualification or to extend your professional qualification,
- management training, aimed at acquiring the competences needed to carry out management activities,
- specialisation training to prepare for specialised teaching activities,
- adaptation training (for beginner teachers), aimed at acquiring the professional competences needed to become an independent teacher,
- pre-accession training, which aims to acquire the professional competences necessary to move to a higher career: preparing the teacher for the 1st attestation (Note: attestation = Hungarian qualifying examination),
- innovation training, aimed at improving, extending, deepening, innovating and renewing professional competences,
- updating training aimed at maintaining, preserving and updating existing professional competences (knowledge, skills, abilities). A certain number of hours per year are compulsory. Minimum scope defined by law. (Zákon č. 138/2019 Z. z. o pedagogických zamestnancoch a odborných zamestnancoch a o zmene a doplnení niektorých zákonov, 2019).

In Hungary, the Government Decree 277/1997 requires the Education Office to maintain an online register of teacher training courses. The lists are maintained through the online platform PedAkked (Pedagogical Accreditation System for Continuing Education and Training), which contains a list of available continuing education and training courses for teachers, as well as other documents and lists related to the use of the system. The Decree specifies how and in what form the weekly and other continuing training courses can be completed (277/1997. (XII. 22.) Korm. rendelet a pedagógus-továbbképzésről, a pedagógus-szakvizsgáról, valamint a továbbképzésben részt vevők juttatásairól és kedvezményeiről). Methods of completing teachers professional development:

- accredited training courses (most often 30-120 hours, less often more),),
- continuing vocational training leading to a specialised diploma or diploma equivalent to a specialised diploma,
- training to obtain an additional qualification (e.g. a teacher's diploma for a new profession, and higher or tertiary-level training announced by the Register of Occupations replacing the National Training Register,
- additional courses recognised by the Regulation (e.g. ECDL, language training abroad).

Rights and obligations of teachers

In Slovakia, Article 3 of the Law 138/2019 gives all teachers the right to in-service training. As of 2019, Article 4 obliges them to maintain and annually update their professional knowledge by attending updating training courses (Zákon č. 138/2019 Z. z. o pedagogických zamestnancoch a odborných zamestnancoch a o zmene a doplnení niektorých zákonov v znení neskorších predpisov).

Given the constant changes and innovations in the school sector, it is essential that teachers participate in in-service training to meet these obligations. Teachers' professional development is governed by the institution's professional development plan. This four-year plan is drawn up by the Director of the institution. The sources of the professional development plan are: the competency profile or professional standard of the school staff (available on the Ministry's website), the strategic plan or concept (action plan, development plan) of the school or school establishment, the training expectations of the teaching staff (based on the law), the results of the staff evaluation, the analysis of their personal professional development plan and their training needs. As stated by Pupiřková (2020), teachers' personal development plans are prepared for one year, including self-training and planned professional development.

In Hungary, Act CXC of 2011 on National Public Education provides, among other things, for the compulsory participation of teachers in seven-yearly in-service training and the introduction of a professional examination. The Act stipulates that it is the fundamental duty of teachers to participate in continuing education (2011. évi CXC. törvény a nemzeti köznevelésről). Teachers are obliged to participate in the required continuing education and have the fundamental right to improve their professional knowledge and skills by attending continuing education. The obligation to undergo continuing training can only be fulfilled by attending training courses whose programme has been approved by the Education Office. The further training obligations of teachers are laid down in the continuing training programmes drawn up by the institutions and approved by the teaching staff concerned.

The Government Decree 277/1997 (XII. 22.) on teacher training, the teacher qualification examination and the allowances and benefits of participants in continuing education details the professional development obligations of teachers in Hungary. The decree defines two basic forms of teacher training: compulsory in-service training every seven years and in-service training in preparation for the teacher's professional examination.

The Regulation stipulates that, after obtaining a diploma entitling a teacher to teach, he or she must undergo in-service training every seven years until the age of 55. If he/she has not voluntarily undergone in-service training during the seven-year period, he/she must attend a compulsory refresher course. Of course, teachers can take part in more than one such course. The Regulation also lists the fields and types of training which are covered by the system of seven-yearly in-service training, and the learning requirements which must be met. It also stipulates that the training must involve at least 120 hours of classroom training. One lesson lasts 45 minutes (277/1997. (XII. 22.) Korm. rendelet a pedagógus-továbbképzésről, a pedagógus-szakvizsgáról, valamint a továbbképzésben részt vevők juttatásairól és kedvezményeiről).

The professional development obligation may be fulfilled as follows:

- 30-60-120 hours accredited teacher training programme,
- teacher qualification,
- a higher education course (bachelor's, master's or specialised further education, partial knowledge course) giving access to a teaching profession;
- participation in complex development projects, in cooperation with the teaching staff, which can be measured in terms of pupil outcomes;

- training for ICT development,
- foreign language training (Education Office - Options for fulfilling the obligation to undergo continuing training, 2012).

Up to 25% of the continuing education obligation can be fulfilled through participation in a research fellowship programme, professional support for a trainee, self-training, at least 5 but no more than 30 hours of non-accredited continuing education, and advisory activities for the teaching community (Pedagógus továbbképzések, 2020).

The detailed conditions for in-service teacher training are also set out in the Government Decree. It stipulates that the heads of the institutions must draw up a five-year in-service training programme, which is prepared on the basis of a joint decision of the pedagogical programme and the teaching staff, and the maintenance authority then decides whether to approve the in-service training programme.

The Decree also specifies the conditions for the organisation and monitoring of continuing training, the criteria for the evaluation of programmes, and the details of the teacher qualification examination. The teacher qualification examination is a prerequisite for teachers to become Master teachers. Further conditions for progression to a higher grade are the completion of the required length of professional practice and the completion of a teaching portfolio. The Master Teacher qualification complements and deepens the knowledge, skills, competences and abilities acquired during university/college education. Preparation for the teacher qualification examination is possible within the framework of specific further training courses, which can only be organised by higher education institutions.

Funding of professional development

In Slovakia, training is mostly self-financed, but there are also training courses funded by the European Union or other projects. Courses organised by civil organisations and private institutions are usually paid, while most of the training organised by the Ministry is free of charge.

The training courses indicated in the institution's professional development plan are usually financed by the provider, as are updating and adaptation courses and some qualification courses. At present, the costs of the qualification training, the basic module of the management training and the pre-accession training are usually reimbursed by the teaching staff. Additional training may be reimbursed by the organiser itself, the EU, the maintainer or other physical persons, according to the criteria specified (Zákon č. 138/2019 Z. z. o pedagogických zamestnancoch a odborných zamestnancoch a o zmene a doplnení niektorých zákonov v znení neskorších predpisov). However, if the teacher has enrolled in a leadership training course as described in the professional development plan with the approval of the teacher's supervisor, he or she does not have to pay the course fee.

In Hungary, the financial basis for teacher training should be planned in the funding sub-programme. If the in-service training takes place within the framework of the public service provision of public education, the in-service training is free of charge. The costs are borne by the central budget, the maintaining authority and the employer. Support for in-service training planned under the funding sub-programme and for in-service training beyond that required for teacher certification may not exceed eighty per cent of the costs. There are, of course, exceptions to this rule, such as reimbursement from private individuals or from the maintainers' own resources or from funds obtained through a call for proposals (A pedagógus-továbbképzéssel kapcsolatos szabályok módosításai, 2014).

Financial allowances based on participation in professional development

In Slovakia, up to 12% of the basic salary is paid as a salary supplement for further training, 6% for further training, 12% for the state language examination and 3-3% for specialisation and innovation training. The salary supplement is valid for seven years (Zákon č. 138/2019 Z. z. o pedagogických zamestnancoch a odborných zamestnancoch a o zmene a doplnení niektorých zákonov v znení neskorších predpisov). Of course, if a teacher moves up from one career to another, his or her salary grade changes. This is conditional on completion of adaptation training or attestation.

In Hungary, there is no financial reward for completing professional development (326/2013. (VIII. 30.) Korm. rendelet a pedagógusok előmeneteli rendszeréről és a közalkalmazottak jogállásáról szóló 1992. évi XXXIII. törvény köznevelési intézményekben történő végrehajtásáról). The only change in salary is when a teacher moves up the career ladder. This can be achieved by completing the following activities: obtaining a school-leaving qualification, a state-recognised vocational qualification, a vocational qualification, a doctorate directly related to the performance of the work of an educator or teacher, a scientific degree, an academic degree, membership of an academy, professional practice, publication activity, passing a qualifying examination.

4 Conclusion

On the basis of the facts presented so far, which have focused on the examination of the professional development systems of teachers in the two countries on the basis of the legislation in force, and in order to make the differences and parallels between the two systems more transparent, we have summarised in a table the main features - similarities and differences - that are relevant (see. Table 1).

Table 1: Comparison of the continuing education system in Slovakia and Hungary on the basis of the legislation in force

Viewpoints	
Nature of legislation: law and government decree	
Slovakia	✓
Hungary	✓
Consistency with the concept of lifelong learning	
Slovakia	✓
Hungary	✓
Institutions competent to provide the teachers continuing professional development	
Slovakia	National Institute of Education and Youth, universities and colleges, church or religious associations, institutions for continuing education: civil organisations and other legal entities - whose object of business includes training activities
Hungary	State institutions, colleges and universities, other organisations
Teacher career profiles	
Slovakia	Similar names, but there are some differences in the expression and number of career positions (SK: 4; HU: 5), but the breakdown itself and the content of each career position are almost identical. The number of mandatory years between the following career paths differs significantly (longer periods in Hungary).
Hungary	
Types of the teacher professional development	
Slovakia	detailed breakdown
Hungary	indication of content and functional options
Rights and obligations of teachers	

Slovakia	Based on a 4-year institutional in-service training plan and the teacher's annual staff training plan; mandatory annual updating training for a given number of hours (currently 10 hours per year, from 2023 20 hours per year for non-accredited training)
Hungary	Compulsory weekly training (120 hours of accredited training) + on the basis of institutional training programmes
Funding of professional development	
Slovakia	free of charge and reimbursement; only the conditions differ
Hungary	
Financial allowances based on participation in professional development	
Slovakia	salary supplement (min 3%, max 12%) only for certain types of accredited training
Hungary	no allowance

From the above table we can see that the professional development of teachers in the Slovak Republic and Hungary is enshrined in legislatively binding documents - laws and decrees. These documents lay down the conditions, requirements, content, scope and organisation of teacher training. We would like to remind you that both training systems can only propose or recognise accredited training (the exception in Slovakia is updating training, which is the responsibility of the institution or provider). In contrast, while in Hungary a long-standing law on continuing training is being amended, in Slovakia several new laws and regulations have been in force for the last 15 years. At institutional level, both countries have a longer-term training plan - Professional development plan for teaching staff, which is four years in Slovakia and five years in Hungary. On the basis of this, the school director in Slovakia has to issue an annual training plan for pedagogical staff.

Based on our analysis, it is evident that the legislative documents on teachers' professional development in both countries compared respect and build on the concept of lifelong learning. It can be concluded that both education systems address the teacher career model in the context of the lifelong learning strategy, which outlines the career opportunities for teachers.

Although the names of the career paths are different, parallels and similarities in their nature were found. Although there are one more (5) career paths in Hungary than in Slovakia, where the law specifies 4. In both countries, teachers start as trainee teachers, from which they can move to a teaching career after a professional qualification. The first stage is called adaptation training in Slovakia and then the person moves to an independent teaching career. Currently, in Slovakia, it is possible to move up to a higher level after a specified length of professional experience (this was not the case until 2019), similarly to Hungary, but the time allowed differs between the two countries (in Hungary, the length of the training required to move up to a particular level is much longer: 2-9-6 years, while in Slovakia it is 1-5-5 years).

Already in Slovakia, the current law requires teachers to prepare a portfolio of their professional achievements, similar to Hungary. In Slovakia, before 2019, a completely different system was in place: the number of credits obtained for the training (60 credits or 30 credits and completion of preparatory training for the attestation) could be redeemed for the attestation, which consisted of an assessment of the work written and an examination.

The table shows that the education laws of both countries provide that teachers have both the right and the obligation to train themselves. However, in terms of in-service training, we found more significant differences between the two countries. In Hungary it is compulsory for teachers to undergo a seven-yearly in-service training by completing accredited course(s), while in Slovakia this is set out in a completely different form: annual

updating training (non-accredited) is compulsory for a certain number of hours, and management training for head teachers (accredited). The difference is also that the Slovak legislation outlines in detail the types of continuing training - qualification training, management training, specialisation training, adaptation training, pre-accession training, innovation training, updating training, whereas the Hungarian regulation only outlines the possibilities of continuing training in terms of content and function - accredited continuing training, continuing vocational training leading to a vocational examination or a diploma equivalent to a vocational examination, training for the acquisition of further qualifications, additional courses approved by the regulation.

There are no significant national differences in terms of providers of teacher professional development. In both countries, universities, colleges and other institutions can be providers, subject to accreditation.

However, as mentioned above, in Slovakia, updating training is organised as a simple training programme from 2019 onwards, which does not need to be accredited. It is organised by the employer or the school and is a valid, directly binding form of professional development for teachers.

We found a significant difference in the cash allowances for professional development, as while in Hungary there is no allowance for completing, in Slovakia there is a payment supplement for completing certain types of professional development.

The above shows that there are some differences in the teacher professional development systems of the compared countries. We consider the most significant differences to be in the obligation for teachers to participate in training and the subsequent financial remuneration. On the positive side, we perceive the fact that in Slovakia teachers are obliged to participate in updating training at least once a year. We dare to say that in Hungary, where teachers are obliged to attend in-service training once every seven years, it is not sufficient due to the constantly changing cultural and social conditions, the development of science and technology and the related development of educational constructs.

The positive aspect of the Slovak system compared to the Hungarian one is also in the financial remuneration of teachers. Financial remuneration is perceived as a certain motivational factor that increases teachers' willingness to participate in various forms of further education, which is also confirmed by the research of Pisonova (2017).

In conclusion, we would like to suggest that the results of our research can be an inspiring framework for developing the system of teacher professional development in the compared countries. At the same time, our results are useful and necessary for colleges and universities that cover the education of future teachers on the territory of the Slovak Republic. The results may be of particular importance for colleges and universities that provide undergraduate training for future teachers who are citizens of Hungary or students who will pursue the teaching in Hungary.

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Primary Paper Section: A

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GEOSTRATEGIC ASPECTS OF GLOBAL SECURITY (USING THE EXAMPLE OF RUSSIAN AGGRESSION)

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Abstract: This article examines the issue of violation of the principle of territorial integrity (integrity) or political independence of states from 1946 to 2022. The approach is based on the study and understanding of domestic and foreign literary sources, statistics, legal acts. Russia gained the status of an independent entity in the international arena immediately after the collapse of the Soviet Union. Almost immediately, it began to show signs of aggression. To promote its geopolitical ambitions, it uses gaps in international law, information and psychological measures, corruption, mercenaries, collaborators, blackmail, the law of force, and tries to rewrite history. The course of military conflicts involving Russia in the Republic of Moldova, Chechnya, Georgia, Syria and Ukraine shows that the scale of violations of international treaties, human rights and the rules of warfare has increased in line with the strengthening of its military capabilities. During the hostilities on the territory of independent Ukraine, Russia showed a complete list of signs of aggression, as defined by UN General Assembly Resolution 3314 (XXIX) of December 14, 1974. This shows that before the armed attack on Ukraine, the aggressor was convinced that it could not be brought to justice and punished. It also hoped that his next victim would not be able to receive international political, economic, military and social assistance. Some actions of Russia in the international arena have signs of state terrorism. During the last ten years, a fascist regime has formed in Russia. The abuse of the veto did not lead to the expulsion of the aggressor country from the UN Security Council. To stop Russia's aggression and prevent similar developments in the future, the issues of improving international law, bringing to justice the political and military leadership of the republic of Belarus and the Russian federation, improving the UN Charter, the powers of the UN General Assembly, depriving Russia of the right to participate in peacekeeping operations.

Keywords: international law, international security, russian aggression, Russian-Ukrainian war, UN Charter, signs of aggression.

1 Introduction

After the end of World War II and the formation of the United Nations (UN), the international community was determined to exclude war from the arsenal of international politics. That is why one of the four goals of the UN (Article 1 of the UN Charter) is to maintain international peace and security take effective collective action to prevent and eliminate threats to peace and suppress acts of aggression or other violations of peace (United Nations Charter).

To achieve this goal, UN member states are obliged to adhere to the basic principles set out in Article 2 of the UN Charter, in particular: to resolve international disputes by peaceful means and in such a way as not to endanger international peace, security and justice, to refrain in international relations from the threat or use of force against the territorial integrity or political independence of any state as otherwise incompatible with the purposes of the United Nations (United Nations Charter). However, the UN era system of collective security has vividly been shown to be inadequate on several fronts (Green, 2022, 28). This article examines the issue of violation of the principle of territorial integrity (integrity) or political independence of states from 1946 to 2022. The approach is based on the study and understanding of domestic and foreign literary sources, statistics, legal acts. So, the historic, comparative, formal juridical and prognostic methods will be used.

In our opinion, there are few cases of aggression with the subsequent annexation of the territory (or part of the territory) of another state after the end of World War II. In particular, Israel annexed East Jerusalem in 1980, the Golan Heights in 1981, and Kuwait in Iraq from 1990-to 1991.

However, only after the temporary occupation and Russia's attempt to annex part of Ukraine – the Autonomous Republic of

Crimea, the temporary occupation of certain areas of Donetsk and Luhansk regions, and especially after the Russian armed invasion on 24 February 2022, the international community started talking about the first violation of the fundamental UN principles, namely the principles of "territorial integrity" and "inviolability of borders".

In our opinion, this is because the above facts of annexation were regional in nature and did not significantly threaten the world order, and in each case involved the mechanisms provided by the UN Charter.

Thus, the non-recognition by the international community of Israel's annexation of East Jerusalem and the Golan Heights was enshrined in the relevant UN Security Council resolutions (Resolution 242, 1967; Resolution 265, 1980; Resolution 297, 1981).

To end the annexation of Kuwait, the UN Security Council on 02 August 1990, the day of the Iraqi invasion of Kuwait, adopted Resolution 660, which condemned the aggressor's actions and demanded that Iraq withdraw all troops from Kuwait immediately (Resolution 660, 1990); On August 6, Resolution 661 was approved, under which all states undertook to ban imports from Iraq, hinder the export of weapons and military equipment, and provide financial and economic assistance (Resolution 661, 1990); On 25 August, following Resolution 665, sea services were suspended, and on 25 September (Resolution 670, 1990), air services were suspended, except for food and humanitarian aid (Resolution 665, 1990); On November 29, Resolution 678 authorized the use of military force against Iraq to liberate Kuwait (Resolution 678, 1990). Cuba and Yemen voted against the creation of an international coalition, and China abstained (Draft Resolution). These measures regulated and allowed Operation Desert Storm to end the illegal annexation of Kuwait (Harvey).

It should also be noted that, unlike Russian Federation's aggression against Ukraine (Nikiforenko, 2020), these cases of aggression and annexation were not accompanied by the aggressor country's most serious crimes under international law: genocide, war crimes and crimes against humanity.

2 Literature research

Today, many independent states are falling victim to Russia's terrorist policy, which is to punish those who criticise its aggressive policies and intimidate the population. Russia inherited the Soviet methods of "red terror" as a means to achieve political goals. The list of victims of the Soviet and Russian special services is far from complete: S. Petliura (1926, Paris); S. Bandera (1959, Munich); Z. Yandarbiyev (2004, Qatar); O. Lytvynenko (2006, London); S. Skrypal and his daughter (2018, Salisbury); M. Shapoval (2017, Kyiv); A. Okuieva (2017, Kyiv). According to the Global Terrorism Index 2019, Ukraine ranks 24th in the world in terms of the consequences of terrorist acts (Kostiuk, 2019; Mykhailichenko et al., 2022).

In 2016, the investigation was resumed in Poland into the death on 10 April 2010 of the Polish political and military leadership on a plane near the Russian military airfield "Smolensk-North". According to the results of the exhumation of the bodies of the victims, the re-examination of the wreckage of the plane, traces of explosives were found. Earlier, Russia considered the crew's mistake to be the cause of the catastrophe, in Poland – the wrong actions of Russian dispatchers. New facts suggest the deliberate destruction of the Polish elite by Russian special services to achieve geopolitical goals (Pacewicz, 2022).

In our opinion, it is necessary to study the circumstances of natural disasters in several neighbouring states with Russia during the aggravation of interstate relations.

To influence political decisions, Russia is trying in every way to penetrate the highest echelons of power of sovereign states. Thus, according to B. Miroshnychenko, bribery of European political elites took place through the monopolisation of the gas market and the employment of former high-ranking officials of some European Union states in the commercial structures of Russia's Gazprom. The Kremlin leader was convinced that cheap energy resources, along with corrupt connections, would leave Ukraine no chance of finding influential allies to defend its sovereignty and territorial integrity (Miroshnichenko, 2022).

Russia uses the profits from exports to purchase and manufacture weapons and ammunition. At the same time, within the structure of customs payments it hides the trade in weapons and ammunition; spacecraft, aircraft (both military and civilian, spare parts for them); warships; tanks, self-propelled armoured vehicles; rare earth metal compounds; radioactive elements and isotopes; natural gas (Chomu).

One of Russia's ways of blackmailing Europe is through migration crises, which it periodically creates. Thus, during the migration crisis on the Polish-Belarusian border (2021), Belarusian law enforcement officers: coordinated the actions of migrants; watched over them; did not pass deep into their territory; carried them along the border to other areas; intimidated migrants (Nikiforenko, Nguen, 2021, 14). The course of events shows that the Member States of the European Union have not drawn the appropriate conclusions from previous migration crises, including the situation with the Hasidim, which 2020 stormed the Belarusian-Ukrainian border (Solonina, 2021). The growth of illegal migration to Ukraine poses a real threat to the security of country (Kuryliuk, Slyvka, Kushnir, 2021).

It is noteworthy that after numerous military defeats, almost simultaneously in the newspaper "NewYorkTimes", in the peace plan of Italy, in the speeches of some European and American politicians called for the need to make concessions in Ukraine and save Putin's face. This is fully in line with Russia's aspirations and could freeze the conflict and give the aggressor time to renew its military capabilities.

The third is Russia's fraudulently gaining and abusing its status as a permanent member of the UN Security Council, which has ultimately blocked the institution from making any decisions regarding Russia's aggression against Ukraine.

3 Results

Why did Russia dare to violate the UN Charter and international humanitarian law? We are convinced that, in addition to the formation of the fascist regime in Russia, this was facilitated by:

first, it is the imperfection of the norms of international law on the prevention of aggression, its cessation and the prosecution of the aggressor country, in particular, its political and military leadership;

secondly – economic, and political, including – nuclear blackmail by Russia, political terror, corruption by Russian intelligence services of top officials of other countries and, as a result, an insufficient response from the international community, UN member states to Russia's illegal actions.

3.1 The principle of consensus in decision-making by the UN Security Council and its abuse by Russia

According to the Charter, it is the UN Security Council that has the primary responsibility for maintaining international peace and security, and all UN member states are obliged to comply with its decisions. Only this institution has the authority to approve the use of military force against the aggressor state (United Nations Charter).

The UN Charter of 26 May 1945 was developed after the end of World War II under the influence of the geopolitical division of the world. It contains a mechanism to block decisions by any permanent member of the UN Security Council by voting against the majority position (Article 23, paragraph 1). That is, the vote of a permanent member of the Council against the decision in question is, in essence, a veto even if he is a party to the dispute (Article 27, paragraph 3).

A positive example of the unanimous vote of the permanent members of the UN Security Council is the decision to take on the events of 1991-2008 in the former Yugoslavia. Despite Russia's separate position on several issues, the international community has succeeded in conducting a peacekeeping operation and stabilizing the situation in the Balkans (Resolution 743, 1992). Yugoslavia has agreed to follow the general principles recommended to it for ensuring the international presence of security forces in Kosovo. The withdrawal of military, police and paramilitary forces from Kosovo has been synchronized with the deployment of an international security presence. The tasks of the international forces included: the prevention of resumption of hostilities, demilitarisation, creation and provision of safe conditions, demining, and border control (Resolution 1244, 1999). As a result, Kosovo found itself under an international protectorate led by the UN Interim Mission.

However, the permanent members of the UN Security Council have repeatedly failed to adopt a common position, which has a negative impact on strengthening international peace and security. In particular, the USSR and Russia voted against in 49% of cases, the United States – 29%, Britain – 10%, China – 6%, and France – 6%. The conflict in Syria has been going on since 2011 when Russia (according to the agreement with Syria) has deployed its military aviation group (The State, 2016). According to the UN, all parties to the conflict are guilty of serious crimes (murder, torture, rape). In 2012 alone, Russia vetoed the Assad regime three times (Shekinsky, 2016). Even the use of chemical weapons by the Assad regime did not end its support for Russia. Due to the impossibility of reaching a consensus in the UN Security Council, other states were forced to form an international coalition without Russian participation (Vendik, 2018) to conduct military operations to counter terrorist groups.

One of the few examples of overcoming the veto is UN General Assembly Resolution 377A (V) of 03 November 1950. However, it is not mandatory (What, 2022).

With the collapse of the USSR, Ukraine, like other independent states in the post-Soviet space, did not take measures to amend paragraph 1 of Article 23 of the UN Charter. This allowed Russia to promote its geopolitical ambitions in the international arena on behalf of the Soviet Union, which had ceased to exist. Other members of the UN Security Council have not initiated measures to bring Article 23 of the UN Charter to new geopolitical realities. There is currently no documentary evidence of Russia's election as a member of the United Nations. For a long time, there were no objections to Russia's vote on the UN Security Council. This contributed to the gradual development of its aggression, and the search for ways to block the measures of influence provided for in Articles 41 and 42 of the UN Charter (interruption of economic ties, transport, force, etc.) against it. According to Article 31 (3) (b) of the Vienna Convention on the Law of Treaties (Vienna, 1969), it is now extremely difficult to challenge her succession as a permanent member of the UN Security Council, as the international community has long recognised.

There is currently no mechanism for terminating the membership of one of the permanent members of the UN Security Council for systematic violations of the UN Charter (Article 2, paragraph 2) (United Nations Charter). In addition, a consensus in the Security Council is needed to amend the United Nations Charter (Article 108).

3.2 Russia in Transnistrian conflict

Among the four unsettled conflicts in the wider Black Sea region the Transnistrian one is often described as the most solvable (Secieru, 2011; 241). Russia was one of the first to provoke the Transnistrian conflict (1990-1992). To resolve it, in 1992 an Agreement between the Republic of Moldova and the Russian federation with the participation of Moldovan, Russian and Transnistrian representatives established a Control Commission to resolve the situation. It provided for the neutrality of the Russian army's 14 units stationed in Transnistria, and for further negotiations on the timing of their withdrawal (Agreement, 1992).

The ruling of the Constitutional Court of the Republic of Moldova stated that after the signing of the Moscow Agreement on 21 July 1992, peacekeeping forces of five Russian, three Moldovan and two Transnistrian battalions under the General Military Command of the OSCE Joint Control Commission (Judgment, 2017).

Russia has signed but not ratified an agreement on the procedure and timing of the withdrawal of its non-peacekeeping troops from Transnistria. The OSCE's special fund has not been used for this purpose. The agreement enshrined the neutrality of the 14th Russian Army, which was constantly violated by the transfer of military property, ammunition and training of militants to the Transnistrian separatists. The actions of the separatists were coordinated with the Ministry of Defense of the Russian federation.

By Resolution No 1334 of November 17, 1995, Russia recognized Transnistria as a "zone of special strategic interest". Russia's de facto "jurisdiction" over Transnistria has been mentioned in several ECtHR rulings. Without Russia's military, economic and political support, the separatist regime could not have survived (Judgment, 2017).

Ukraine has also been involved in resolving this conflict (Agreement, 1995). At the same time, the ceasefire was provided by units of the 14th Army, which remain in Transnistria. They continue to pose a threat to Ukraine and the Republic of Moldova.

3.3 Russia in Chechen conflict

The first (1994-1996) and second (1999-2009) Chechen wars took place on the territory of the Russian federation, which allowed it to conceal war crimes. The international community has hardly been involved in verifying the results of Russia's "peacekeeping operations". No one tried to stop the outright offences. The Chechen issue has been on the agenda of the UN Commission on Human Rights. However, the resolution was not approved. In 2002, Russia suspended the OSCE in Chechnya. UN special rapporteurs on torture and illegal, arbitrary and summary executions did not wait for the opportunity to visit the region. Only a few foreign embassies have shown interest in obtaining information on human rights violations from primary sources (Dener, 2004).

As a permanent member of the Security Council, Russia has been able to bring the situation in Chechnya out of UN control. She put a lot of effort into presenting the situation as stabilising, but could not resolve the situation.

In 2003, the conflict spread to Ingushetia, where federal forces committed similar offences. The governments of the United States and European countries continued to negotiate with Russia on political and economic issues (missile defense, energy, common policy in the Middle East). It cannot justify the reluctance of the international community to uphold human rights guarantees and hold Russia accountable (Dener, 2004).

The federal government has set up a human rights body in Chechnya, represented by the president's special envoy for human and civil rights and freedoms. The established national

commission worked formally. At the request of the PACE in 2001, the Russian government released a list of criminal cases opened in connection with the Chechen conflict. It was found that most cases did not go to court, and no cases were initiated on the facts of torture (Dener, 2004).

The international community has come to terms with Russia's position on preventing international observers from entering Chechnya. Through diplomatic and other impunity, the Russian government has clarified the political will of the international community, and tens of thousands of Russian law enforcement officials have become accustomed to impunity (Dener, 2004).

3.4 Russian-Georgian conflict

Before the start of the war with Georgia in 2008, Russia single-handedly carried out a peacekeeping mission in Abkhazia under UN Security Council resolutions. This was supported by all members of the UN Security Council (Resolution 849, 1993).

EU Parliamentary Assembly Resolution 1633 (2008) stated that the beginning of this war was the result of an escalation of tensions that had begun much earlier. Full-scale hostilities took place after the shelling of Tskhinvali on 7 August 2008, classified as the disproportionate use of military force by Georgia, albeit on its territory, in violation of international law and the obligation to resolve the conflict peacefully (Resolution 1647, 2009).

Russia's counterattack was also found to be inconsistent with the principle of proportionality and international humanitarian law. This has led to Russia's occupation of much of Georgia, and the destruction of infrastructure, which can be seen as either a direct encroachment on Georgia's sovereignty or an extension of its influence (Resolution 1647, 2009). Russia still controls 20 percent of Georgia's land territory, and Georgia's territorial waters and exclusive economic zone off the coast of Abkhazia have long been treated as an integral part of Russia's territorial waters and exclusive economic zone (Atland, 2021, 319).

Both sides of the conflict did not rule out the possibility of using military force. The format of the peacekeeping operation did not achieve the set goals, and the peacekeeping forces failed to fulfil the task of protecting the lives and property of citizens in the conflict zone. Calls for discussion of a change in the format of the peacekeeping operation and the conflict resolution process were rejected by the South Ossetian and Russian sides (Resolution 1647, 2009).

UN resolutions have identified such unacceptable actions of Russia on the territory of Georgia as: "protection of citizens abroad"; recognition of the independence of South Ossetia and Abkhazia; violations of human rights and humanitarian law (premeditated killings, deaths and injuries of civilians, destruction of property); indiscriminate use of force; looting; ethnic cleansing (Resolution 1647, 2009).

Resolution No 1647 (2009) of the EU Parliamentary Assembly shows signs of systematic violations of international law. Required (Resolution 1647, 2009): from Georgia – fulfilment of unfulfilled requirements, bringing the law on the occupied territories in line with international norms. From the Russian federation – full implementation of UN General Assembly resolution 33 1633 (2008), including revocation of the decision to recognize the independence of South Ossetia and Abkhazia, withdrawal from the Akholgori region, reduction of military presence to the level of conflict, consent to OSCE mission, cessation of ethnic cleansing, human rights violations, prosecution of perpetrators (as done by Georgia), cessation of administrative provocations border, ensuring the return of migrants.

Many UN members have seen Russia's military conflicts in Chechnya, Moldova, Georgia and Ukraine as almost internal to the Commonwealth of Independent States (CIS). In addition, the

international community has always expected the aggressor to perform their role as a peacekeeper in the post-Soviet space.

Also, the geopolitical ambitions of the aggressor were not taken into account even by the victim states. It is evidenced by the Agreement on the Principles of Peaceful Settlement of the Military Conflict in the Transnistrian Region of the Republic of Moldova of 21 July 1992 (Agreement, 1992), which was concluded between the Republic of Moldova and Russia. Russia's Memorandum (1994) also did not deter Russia from waging war against Ukraine.

3.5 Russian-Ukrainian war

Ukrainian-Russian relations in history took place under the desire of the Moscow principality and its successors – the Russian Empire, the USSR and the Russian federation to prevent the independence of the Ukrainian state (Horbulin, 2016). To force Ukraine to renounce its newly declared independence, an official Russian delegation arrived in Kyiv on August 28, 1991, threatening to revise the borders (Horbulin, 2016). On 09 July 1993, in violation of international law, the Russian parliament passed a resolution on the Russian status of the city of Sevastopol. Since the beginning of the collapse of the Soviet Union, Russian political elites have not doubted that under the influence of economic pressure, the former Soviet republics will be forced to unite with Russia into a single state. They tried to rebuild the illusion of good neighbourly relations. Without this, it was impossible to sign the "Budapest Memorandum" on Ukraine's renunciation of its nuclear state status through the voluntary transfer of nuclear weapons to Russia.

Despite the signing of the Treaty of Friendship, Cooperation and Partnership between Ukraine and the Russian federation in 1997, in 2003 Russia tried to capture the Ukrainian island of Tuzla in the Kerch Strait (Horbulin, 2016). In 2003, the Agreement between Ukraine and the Russian federation on the Ukrainian-Russian State Border was signed. At the same time, Russia has constantly slowed down the demarcation process, i.e. marking the state border with Ukraine on the ground. Ukraine was forced to unilaterally mark it with information signs. Russia has consistently refused to define the line of the common state border in the Azov and Black Seas.

In 2006, the process of economic pressure on Ukraine began with the resolution of several stages of gas wars (Horbulin, 2016).

Since 2008, Russia's strategic documents have stated that Ukraine cannot be an independent state. Since 2006, the Russian FSB has set up groups to promote the ideology of "Russian World" in Ukraine through social networks. Comprehensive support was provided to pro-Russian political parties for their victory in the electoral process to enter the legislative and executive branches of government as well as local self-government bodies. For all manifestations of aggression, the international community used the tactics of reconciliation of the aggressor, which, in turn, pushed it to more bold violations of international law.

In 2014, Russia took advantage of the political crisis in Ukraine and the presence of its Black Sea Fleet military base on the territory of Ukraine in the Autonomous Republic of Crimea and began the annexation of the Crimean Peninsula (Zadorozhnia, Mykhunenko, Kovalenko et al., 2021). Since 2014, Russia has blocked decisions on the situation in Ukraine by the UN Security Council. It should be emphasized that since 2014, the majority of Russians have supported the actions of Putin's political regime toward the independent Ukraine.

UN General Assembly Resolution No 68/262 27.03.2014 expressed support for Ukraine's sovereignty and territorial integrity within its internationally recognized borders. It also identified the illegality of Russia's referendum in Crimea and the illegality of changing the status of the Autonomous Republic of Crimea (Resolution 68/262, 2014).

Russia's violations of human rights in Crimea from 2016 to 2021 are reflected in numerous statements, reports and UN resolutions. They were aimed at destroying the pro-Ukrainian part of the local population and suppressing democracy.

The long and creeping illegal annexation of Crimea began long before 2014. Russia has been preparing for this step since 1992. Then the Supreme Soviet of Russia recognized the decree of the Presidium of the Supreme Soviet of the USSR in 1954, which included Crimea in the Ukrainian SSR, as having no legal force. According to the Russian leadership, the occupation of Crimea was to become a springboard for the occupation of all of Ukraine. But the Russians were not ready for the Ukrainians to stand firm in defending Ukraine's independence.

At the same time, the lack of adequate response from the international community to Russia's annexation of the Crimean Peninsula has led to the escalation of the military conflict in the Ukrainian Donbas. Russia's signing of the Minsk Agreements under the auspices of the OSCE did not stop the shelling of Ukrainian-controlled territory, continue to supply weapons and ammunition to illegal armed groups and use its troops in the temporarily occupied Donbas, according to numerous OSCE reports.

With the beginning of the open invasion of Ukraine in February 2022, Russia blocked the adoption of a UN Security Council resolution. The aggressor hoped that Ukraine would not be supported by the international community. At the UN General Assembly, Resolution No ES 11/L.1 of 2 February 2022 condemned Russia's aggression. Of the 193 UN members, 141 have voted in favour of an immediate cessation of Russia's use of force against Ukraine and the withdrawal of its troops from its internationally recognized territory (Resolution ES 11/L.1, 2022).

In our view, the role of the OSCE and NATO (The North, 1949) in ensuring international peace and security remains low. Thus, a special OSCE monitoring mission has been deployed in Ukraine since 2014 to reduce tensions and ensure peace, stability, security, monitoring and supporting the implementation of all OSCE principles and commitments. At the same time, Russia has refused to extend the scope of its activities to the temporarily occupied territory of the Autonomous Republic of Crimea (Decision, 2014). From 2014 to 2021, the OSCE Mission's daily reports recorded systematic violations of the Minsk Agreements by Russia, but it did not bear any responsibility for this. Russia's membership in the Council of Europe was suspended only on 16 March 2022, by a unanimous vote of the members of the Parliamentary Assembly of the Council of Europe (Resolution, 2022).

With the beginning of the open invasion of Ukraine, Russia made it impossible for the OSCE Mission to Ukraine. Following the order of the OSCE Secretary General dated 24.02.2022, the OSCE Special Monitoring Mission in Ukraine carried out the temporary evacuation of all its international members from the area of activity (located in Kherson, Odesa, Lviv, Ivano-Frankivsk, Kharkiv, Donetsk, Dnipro, Chernivtsi, Luhansk and Chernivtsi) (OSCE, 2022).

For a long time, the world did not recognise the importance of Ukraine and the importance of warnings about Russia's preparations for war against Ukraine and did not apply the necessary harsh preventive sanctions against Russia to make Moscow feel that any aggression will not escape them. But Russia has always known that a few steps are against our state, a few steps in our region – and the consequences will be felt on all continents. That is why Russia needs control over Ukraine. That is why the basic interest of the world now is to help defend Ukraine (Orlova, 2022).

During 2014-2022, we note the presence of all signs of aggression identified by UN General Assembly Resolution No 3314 (XXIX) of 14.12.1974, which are listed in the table 1 (Resolution 3314, 1974). In 2022, Russia carried out an act of

aggression in a coalition with the republic of Belarus, which provided its territory for this purpose.

Russian aggression is also accompanied by the commission of numerous crimes in Ukraine, the characteristics of which are defined by the Rome Statute of the International Criminal Court (Rome, 1998). In particular, in almost all settlements liberated by the Armed Forces of Ukraine, the facts of genocide were revealed, consisting of the intention to destroy the national and ethnic identity of the Ukrainian people. There are mass crimes against humanity (deliberate killing of civilians, deportation of people from temporarily occupied settlements to Russia, torture, rape, abduction, persecution of political, national, ethnic, cultural and religious figures, deprivation of access to food).

No less numerous are war crimes (deliberate killings, torture, not due to military necessity destruction of property, forced service in the enemy armed forces, attack on civilians not participating in the war, the occupier's movement of part of its population to the temporarily occupied territory, destruction medical institutions, schools, historical monuments, religious buildings that are not for military purposes, the use of weapons and ammunition of non-selective action, causing unnecessary suffering, etc.). Similar crimes were committed by the Russian military in Chechnya, Moldova, Georgia and Syria. However, Russia has never taken adequate responsibility for this.

In the short, medium and long term, the factor of Russia's hybrid threat will play a significant role in shaping the security environment, which makes the issue of national security and state stability especially relevant. Due to the lack of effective international mechanisms for regulating modern legal relations, the basic institutions of international law are weakening.

The armed aggression of the Russian Federation against Ukraine is a direct proof and consequence of the attempts to revise the rules established after the end of the Second World War.

Differences in values and interests between states and attempts of individual states to reconsider the existing world order by changing borders and capturing new territories are the most pressing threat not only to Ukraine but to the whole world.

4 Conclusion

The imperfection of international law on the prevention of aggression, its cessation and prosecution of the aggressor country, including political and military leadership, the insufficient response from the international community, UN member states, and attempts to appease Russia as an aggressor country had the opposite effect and led to the growth of its aggressiveness in foreign policy.

Receiving status as a permanent member of the UN Security Council by fraud and it has allowed Russia to block any decision by the institution against Russia's aggression toward other states while brutally violating international humanitarian law. During Putin's rule, a fascist regime has emerged in Russia that ignores international law, uses economic, political, nuclear blackmail and military force against other countries, and threatens the world.

The international anti-putin coalition formed after Russia's aggression against Ukraine should strengthen Ukraine's comprehensive support for its victory in the Russian-Ukrainian war and weaken Russia, to reduce its capacity for future aggression.

It is necessary to take further political and diplomatic steps to expand the coalition at the expense of countries that, for economic or political reasons, take a neutral or uncertain position.

Russia, as an aggressor state, its political and military leadership must be held accountable for aggression against Ukraine,

genocide against the Ukrainian people, war crimes and crimes against humanity.

It is also necessary to consider the responsibility of the political and military leadership of the Republic of Belarus for participating in Russia's aggression against Ukraine.

Deprive Russia of its status as a permanent member of the UN Security Council for abusing the right of veto, which has led to violations of UN principles and norms of international humanitarian law.

To prevent future abuses of the right of veto by other countries – permanent members of the UN Security Council to amend the UN Charter, which would prevent the use of the veto by the aggressor country;

In the framework of UN reform, to increase the role of the General Assembly, namely to introduce a rule that makes its decisions binding on the Security Council (for example, when 75% of UN member states voted in favour), and a separate procedure for overcoming veto;

First of all, to submit to the UN General Assembly the issue of terminating the presence of Russian troops on the territory of Moldova, Georgia, and other states that have raised such issues before the UN;

Given that UN reform measures will be blocked by the Russian federation and possibly other states, Ukraine needs to urgently address national security issues in the postwar period by joining the European Union (Kuderska, Ksenziuk, Kuryliuk et al., 2022), creating an effective regional security system with its allies, especially the United States, United Kingdom, Poland, the Czech Republic, Slovakia, Lithuania, Latvia and other interested countries.

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INTERNET ADDICTION AMONG PRIMARY SCHOOL PUPILS

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The results of the research point to the need for increased prevention in the school in the school environment in the area of risky online behaviour and will serve as a theoretical basis for the research task VEGA No. 1/0396/20 entitled "The impact of electronic media on the behaviour and development of cross-cutting competences of Generation Z."

Abstract: The aim of the study was to map the extent of internet use among primary school pupils. The Internet Addiction Test (IAT) scale was developed by K. S. Young Kwon and the Social Media Engagement Questionnaire (SMEQ) scale. The construct validity of the scale (SMEQ) was verified through exploratory factor analysis. We determined the internal consistency of the scale through a Cronbach alpha value of 0.860, and for the IAT scale, the Cronbach alpha value was 0.920. We divided the research population into three groups (habitual internet users, addictive internet users, and addicts). The research sample consisted of 1,357 respondents aged 10-16 years (AM = 12.64). From the research results, we found that the higher the level of social media engagement among pupils, the higher the level of internet addiction. There was no statistically significant difference between boys and girls in the rate of internet addiction ($p = 0.424$). We confirmed a statistically significant relationship between pupils' engagement on social media and addictive internet users ($p = 0.001$).

Keywords: addictive internet use, internet, school, social media

1 Internet addiction among primary school pupils

Electronic media with an internet connection are a common part of the everyday life of individuals in the digital society of which children and young people are a part. Time spent on the internet does not always constitute a problem of internet use or addiction, but it does have an impact on the 'balance of life'. In cases where repeated compulsive and uncontrolled use of online technologies is associated with negative consequences, one can speak of signs of internet addiction (Šmahel, 2012). However, this statement has been and remains controversial, with different researchers and authors still using different terms to describe the situation, such as: *internet addiction, pathological internet use, netoholism, compulsive internet use, webholism, addictive behaviour in relation to electronic media and the internet, excessive use of electronic media*. Other related terms such as *problematic internet use, compulsive internet use and excessive internet use* are mentioned by Shek et al. (Blinka, 2014).

According to K. S. Young (2009), 'internet addiction' is defined as any online compulsive behaviour that disrupts normal life and causes serious negative consequences for an individual's family, friends, loved ones, or work environment.

The term '*internet addictive behaviour*' refers to internet addiction as: a pathology or obsessive-compulsive disorder in which an individual experiences excessive use of technology and includes a wide range of behaviours and impulse control problems. A person may become addicted to addictive substances or activity, as well as to the use of new information and communication tools (Salicetia, 2015).

Throughout this thesis, we will mainly use the term '*excessive internet use*' and this is to avoid medical or morbid naming. We identify with the content of the term as presented by D. Šmahel and his collective, according to whom the notion of internet over-use means more than just use (Šmahel, 2012).

Although there is some consensus among researchers as to which symptoms define excessive internet use, they do not always agree on the extent to which it can be considered an addiction and thus a pathological phenomenon.

According to K. S. Young, the diagnosis of internet addiction is quite complex. Unlike chemical dependency and substance

abuse, the internet offers several direct benefits, such as the technological advancement of society. Individuals can use technology to communicate, search for new information, conduct business transactions, access libraries, educate themselves, and more. In comparison, addictive substances are not an integral or necessary part of our personal and professional lives, and they do not provide any health benefits. On the other hand, the possibilities offered by the internet can be seen as 'practical uses of the internet' and any signs of addiction can easily be justified by them. K. S. Young has compiled an 'Internet Addiction Test' (IAT). The IAT assessment tool was constructed to measure the symptoms of internet addiction and is a measure of internet addiction. The form of the test measures the extent of engagement in computer and smartphone use in the client and classifies levels of mild, moderate and severe impairment within addictive behaviours. The twenty-item questionnaire measures characteristics and behaviours associated with internet use that include compulsivity, escape, and addiction.

At the same time, we would like to point out the difference between the concepts of '*addiction*' and '*excessive use of the internet*'. Nestler states that '*addiction*' generally refers to a situation in which an individual is unable to control a certain type of behaviour, which is characterised by a degree of compulsiveness, and the individual continues to engage in it despite the fact that it is detrimental to his or her quality of life (In Blinka et al., 2015). Internet addiction can be said to occur when internet use meets the factors of addiction. The internet is now a necessary part of the lives of people living in this society and for many individuals its use can be time-consuming, but at the same time it presents a number of benefits for them. An individual usually becomes addicted when they are repeatedly unable to control a type of behaviour that is characterised by a significant degree of compulsivity and continue to engage in it despite the fact that they are demonstrably harming themselves and the wider environment in doing so.

None of the online addictions have yet been formally introduced into the health care system, nor are they specified in diagnostic manuals. They are implicitly expressed in the manuals of the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases (ICD10).

The revised version of the DSM can be helpful in diagnosing online addictive behaviour, for example pathological gambling as a psychiatric diagnosis first appeared in the DSM-III manual in 1980, when it is classified as an impulse control disorder. The DSM-IV already defines pathological gambling as a behavioural addiction, and it has also proved to be an appropriate manual for measuring CIU - Internet addiction. Based on the DSM-IV, the 14-item CIUS questionnaire (Meerkerk et al., 2009) has been constructed and is considered to be the best-rated diagnostic tool for diagnosing internet addiction. Based on the DSM-V, criteria for online computer game addiction and internet use disorders are derived.

Online addiction can be diagnosed on the basis of Young's (1996) criteria:

1. interest in the internet, thinking about realised activities in the virtual environment in offline time, and thinking about possible future activities realised in the online environment
2. feeling the need for and prolonging the time spent on the internet due to the need to achieve satisfaction
3. failure to gain control over the internet, failure to reduce or stop using the internet altogether
4. experiencing discomfort, restlessness, irritability, depression, moodiness when trying to reduce or stop using the internet
5. a tendency to stay connected to the internet longer than the individual originally planned
6. threatening or risking the loss of a significant relationship (education, career opportunity)

7. lying to family members and others in an attempt to conceal the extent of internet involvement.
8. using the internet as a way of escaping from problems and in order to relieve dysphoric moods (feelings of depression, anxiety and helplessness, guilt)

David Šmahel (2003) complements the diagnosis of addiction to the online world with items

9. the representation of the internet in the value ranking in one of the first places
10. deterioration of mood after disconnection from the internet
11. impaired concentration if the individual is not connected online
12. the perception that the world is largely unreal after disconnecting from the internet
13. experiencing significant anxiety and depression when not online
14. an unrelenting tendency to use the internet despite previous problematic experiences
15. limitation of interests - sporting, cultural, recreational due to the internet
16. causing problems in carrying out work, family or school responsibilities because of the internet
17. reduced social contact with friends as a result of the internet

Addiction can be considered as a state of an individual when he/she identifies with at least 7 criteria in a time span of 12 months.

The issue of internet overuse and addictive behaviours on the internet is becoming a more frequent area of interest among several experts, which brings several clarifications to the concept. M. D. Griffiths (2018) was one of the first experts to address the area of internet addiction. He came to the conclusion that the terms '*internet addiction*' and '*smartphone addiction*', which he initially identified, do not sufficiently reflect the real contents of the issue. Individuals are addicted to the content that is mediated by the device-medium. These are online games, online gambling, online sex, online shopping. The aforementioned contents are seeking to satisfy addictive behaviours.

There is also a risk of dependency in the area of interpersonal communication within social networks, which can be created in both physical and virtual environments. We already find the content of the concept of social networks in the context of the research of J. A. Barnes from 1969. In a study of social ties among fishermen in Norway, he found that an entire society can be defined as a set of points that, connected by ties, form an overall network of relationships - a social network (Barnes, 1969). The term '*sosialt nettverk*' is defined by Fines in 1996 as informal relationships between people who communicate with each other more or less regularly (Berndtson, Gundersen, 2021). In 1988, Jarkko Oikarinen created the first IRC (Internet Relay Chat) application called 'OuluBox'. It was a redesign of Jukka Pihla's MUT (Multi User Talk) chat program, which represented the first ever real-time possibility of communicating with another person over the internet (www.eye-rys.com, 2021). Here, social networks already represent a virtual space where one translates the human need for interpersonal communication, and the possibility arises to sanitise needs absent in the physical environment. The definition of 'social network addiction' as a type of internet addiction is provided by (Griffiths, 2018). The view can be supported by the findings of Shebenova (Sejčová, 2011), who lists the different modes of communication that can give rise to a progressive addiction, as well as specific types of internet addiction. These are: '*word wide web addiction*', '*chat addiction*', '*e-mail addiction*', '*webphone addiction*'.

In the context of internet addiction, it can be stated that addiction refers to the activities provided by the device or transmission and does not refer to the device itself.

2 Methodology

Nowadays, the internet is used by more and more people all over the world, it finds its application mainly in connection with the activation of internet communication applications, social networks installed in smartphones. Among the most famous are Facebook, Instagram, WhatsApp, Twitter and others. It is precisely the 'unlimited' possibility of connecting to the internet via a smartphone, which is owned by 1% of children aged 3-4, 5% of children aged 5-7, 35% of children aged 8-11 and 83% of young people aged 12-15, that allows children and young people to have almost permanent access to their profiles on social networks. Constant access to the internet allows individuals to interact with other people at any time and in any place and can also lead to compulsive 'controlling' behaviour or over-engagement within social networking sites. From this aspect, it is necessary to pay attention to the issue at hand in a theoretical, but especially in an empirical level. The aim of the research was to identify and analyse the risk of the development of addictive behaviour on the internet among children and young people. The results of the research represent a certain starting point for the creation of measures related to the risky use of the internet, and at the same time represent a certain starting point for the design of preventive actions and activities of risky online behaviour of pupils.

To measure internet addiction, we used the *Internet Addiction Test (IAT) scale*, authored by K. S. Young. The test battery consists of 20 items - statements focusing on personality characteristics and behaviours associated with compulsive internet use, escapism, and addiction. Overall, the test measures mild, moderate, or strong internet addiction. The respondent answers statements on a five-point Likert scale, with items 0 = not at all to 5 = always, reflecting the extent to which the statements are indicative of the respondent's specific behaviours, and thus of the respondent's daily routine, social life, sleep patterns, or experienced feelings. The scale was developed based on the DSM-IV criteria for pathological gambling and on a modification of a previous questionnaire by K. S. Young.

The internal consistency of the instrument was assessed by means of Cronbach's alpha 0.920. Based on the IAT scores, we identified Internet addiction (numbers and %); in future analyses, we will work with this subset of the study population.

Reflecting the analysed studies, in our research, we worked with independent variables such as gender and age. Due to limiting circumstances, a within-subjects selection of respondents was chosen in the research. A total of 1,437 respondents participated in the research. Data collection was done through a questionnaire that was distributed to the pupils in person.

We surveyed social media engagement using the Social Media Engagement Questionnaire (SMEQ). Cronbach's alpha was 0.860. For the Social Engagement Scale, we conducted a factor analysis based on the values. To analyse the internal structure of the Social Media Engagement Questionnaire (SMEQ), an exploratory factor analysis was chosen, using the principal components analysis method. The appropriateness of using factor analysis on the data obtained was verified by the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. Both tests, by their values, allowed the use of factor analysis. The goodness-of-fit of the Bartlett test was $\chi^2 = 3,572.638$ ($p < 0.001$) and that of the KMO test was 0.799.

We identified 1 factor that explained 65.143% of the total variability in the sample studied. The items "How often did you use social media 15 minutes before going to bed?", "How often did you use social media within 15 minutes of waking up?", "How often did you use social media at breakfast?", "How often did you use social media at lunch?" and "How often did you use social media at dinner?" saturated this factor. The minimum factor loading for the items to be included in the factors was 0.40.

The scale on the Social Media Engagement Questionnaire (SMEQ) provides a solution to this problem and measures the

extent to which people tend to engage social media in key everyday activities. The SMEQ scale consists of five items on an eight-point Likert scale with response options ranging from 0 = not even one day to 7 = every day of the week. Data collection was conducted through a questionnaire that was distributed to the pupils in person.

We distributed a total of 1691 questionnaires to pupils in grades 5-9, 1,437 surveys were returned, a return rate of 84.97%. We discarded 80 questionnaires (5.57%) due to identical responses to all items, responses without regard to content, or incomplete responses. The final number of correctly completed questionnaires by respondents was 1,357. Of this number, 685 were boys (50.48%) and 672 were girls (49.52%) in the study population. Table T3 presents the representation of respondents from each county by gender.

In terms of age, the age range of the respondents was from 10-16 years (Tab. 1). Table also shows that pupils aged 12 years were the most numerous group (21.89%), while pupils aged 16 years were the least numerous group.

Tab. 1 Distribution of respondents by age and gender

age	gender				total	
	boys		girls		N	%
	n	%	n	%		
10 years	51	3.76	49	3.61	100	7.37
11 years	135	9.95	138	10.17	273	20.12
12 years	149	10.98	148	10.91	297	21.89
13 years	119	8.77	123	9.06	242	17.83
14 years	133	9.80	121	8.92	254	18.72
15 years	90	6.63	79	5.82	169	12.45
16 years	8	0.59	14	1.03	22	1.62
Total	685	50.48	672	49.52	1,357	100

Legend: n-number; %-percentage; N-number of all pupils

In the following table Tab. 2, we present the statistical indicators of the age variable. The values obtained show that the mean age of the pupils in the research population is 12.64 years, the value of the sample mean is $M = 13.00$ and the standard deviation is $SD = 1.550$. The statistical indicators of the shape of the distribution for the variable age took the values of: the coefficient of skewness $\gamma_1 = 0.112$ and the coefficient of steepness $\gamma_2 = -0.962$.

Tab. 2 Descriptive variables age

AM	Mdn	SD	slope	steepness	min	max	N
12.64	13.00	1.55	0.112	-0.962	10	16	1,357

Legend: AM-mean; SD-standard deviation; Mdn-median; N-number of all pupils

Based on the rationale for the selection of the independent variables, we established our research hypotheses:

H1: We hypothesise that there is a difference between boys and girls in the rate of internet addiction in favour of girls.

H2: We hypothesise that there is a positive relationship between social media engagement and the rate of internet addiction.

To identify statistically significant differences and relationships between variables, we used parametric tests of Pearson's correlation coefficient and Pupil's t-test for two independent samples. Parametric tests were chosen based on the analysis of the coefficients of skewness and steepness of the data and the result of the Shapiro-Wilk normality test. Among the descriptive statistics, we used arithmetic mean (AM), standard deviation (SD), median (Me), minimum (Min) and maximum (Max) of the measurement. We analysed the data using SPSS 20.0 software.

3 Research results

Based on the scores of the pupils, we found that 1,051 pupils (77.50%) belong to the average internet users, 276 pupils (20.30%) belong to the at-risk internet users and 30 pupils

(2.20%) can be classified as internet addicts according to the scores obtained. (Tab. 3)

Tab. 3 Internet addiction in terms of the gender of the pupils studied

Legend: %-percentage; n-number

We found that the level of statistical significance between the measured variables acquired a value of $p = 0.424 > 0.05$. Based on these empirical findings, we can conclude that a statistically

	boys n = 685		girls n = 672		N	%
	n	%	n	%		
regular internet users	523	76.4	528	78.6	1,051	77.5
endangered internet users	144	21.0	132	19.6	276	20.3
internet addicts	18	2.6	12	1.8	30	2.2

significant difference between boys and girls in the degree of excessive internet use has not been confirmed. We can state that the hypothesis H1 was not confirmed and we conclude from this that there is no statistically significant difference between boys and girls compared to excessive internet use. Table 4 shows that there was no statistically significant difference between boys and girls in the rate of excessive use of internet ($p = 0.424$).

Tab. 4 Statistically significant difference in the rate of internet addiction in the context of gender

Internet addiction							
Levene's test		Pupil's t-test		boys n = 144		girls n = 132	
F	p	t	p	AM	SD	AM	SD
8.425	0.004	-0.801	0.424	2.50	0.36	2.54	0.42

Legend: n-number; AM-mean; SD-standard deviation; F-value of Levene's test; t-value of Pupil's t-test; p-statistical significance

In hypothesis H2, we assumed that there was a positive relationship between social media exposure and the rate of excessive internet use. The hypothesis was confirmed on the basis of statistical significance $p 0.001$. Based on the testing, the level of statistical significance took the value of $p = 0.001$, where the relationship between the two variables was confirmed.

Based on the value of $q < 0.5$, a moderate relationship between these variables is indicated. The coefficient of determination $r^2 = 0.205$ suggests that 19.90% of the variance in the level of social media engagement is accounted for by excessive internet use, 80.10% is due to the influence of other variables. (Table 5)

Tab. 5 Relationship between pupils' engagement on social media and internet addiction

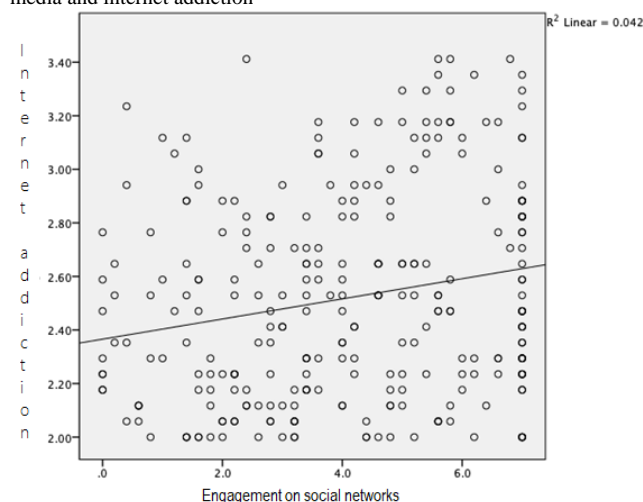
	N	AM	SD	r	p
Engagement on social media	276	4.07	2.11	0.205	0.001
internet addiction		2.52	0.39		

Legend: N-number of all pupils; AM-average; r-Pearson correlation coefficient; p-statistical significance

Based on the value of $q < 0.5$, a moderate relationship between these variables is indicated. The coefficient of determination $r^2 = 0.042$ suggests that 4.20% of the variance in the level of social media engagement is accounted for by excessive internet use, 95.80% is due to the influence of other variables. Based on the presented findings, we can state that the higher the level of involvement on social media among pupils, the higher the rate of the excessive internet use among pupils. (Figure 1)

Figure 1 illustrates the graphical form of the relationship between time of social media engagement rate and internet addiction.

Figure 1 Relationship between pupils' engagement on social media and internet addiction



4 Discussion

The aim of the study was to identify internet addiction among elementary school pupils. This is a type of addictive behaviour that research suggests has an impact on children's physical and mental health.

Children also sometimes use the word 'addiction' to describe their own behaviour. For example, in *Common Sense's* 2016 research, half of teens said they "feel" they are addicted to their mobile device. Three-quarters of them said they feel compelled to instantly react to texts, social media posts, and other notifications, John H. N. Fisher and Jennifer Caldwell (2016).

Based on the findings presented, we can conclude that the higher the level of engagement on social media among pupils, the higher the level of internet addiction. Internet addiction and social media have been partially addressed by Fisher, J. H. N. and Caldwell, J. in their research *Social Media, Social Life: Teens Reveal Their Experiences* (2018). The research reports that nearly half (47%) of smartphone-owning young people say they are "addicted" to their smartphone, but only 24% say they are "addicted" to social media. Most teens report that they have no problem disconnecting from their devices when they need to. Twenty-four percent "strongly" agreed and 40% "somewhat" agreed. On the other hand, 35% of respondents claimed that they have a problem disconnecting from their own devices. The results of the research were compared to the 2012 *Social Media, Social Life pedagogy research: How Teens View Their Digital Lives* (Rideout, 2012) and found that there has been no significant increase in addiction over the 6 years. Despite the large increase in smartphone ownership and in the 'boom' in social media use that has occurred over the last six years, there has been only a slight increase in the percentage of young people who describe themselves as 'addicted' to their phones (41% in 2012 and 47% in 2018). The surprising finding is that since 2012, when 20% of young people identified themselves as addicted to social media, the proportion has increased to 24% by 2018, it did not show any statistical change to the authors. According to Ayla Kaya and Ayşegül İşler Dalgiç (2021), adolescents who used the internet for seven or more hours daily or primarily for gaming purposes showed higher levels of internet addiction. The mean HLBS-II scores were higher for participants who started using the internet after the age of 11 or those who used it for an average of up to two hours each day. Research by Terézia Fertaľová, Iveta Ondriová, Livia Hadaš, Lucia Dimunová, Jana Cina, Tatiana Shantova, Andrea Šuličová, Silvia Cibriková and Jana Cuper (2019) showed that 47% of the respondents felt aggressiveness and irritability when someone

disturbed them while using the internet. 60.33% of respondents thought that life without the internet would be boring, empty and sad. 75.33% of the respondents at least rarely think about going online soon.

Jean M. Twenge's research (2017) reports that eighth graders spending 10 or more hours a week on social media are 56% more likely to be unhappy than pupils who spend less time on social media. Frequent social media users have a 27% increased risk of depression. Kross (In Csepeli, Nagyfi, 2014) reports that the more people use Facebook, the more they fall into depression.

Table 4 shows that there was no statistically significant difference between boys and girls in the rate of internet addiction ($p = 0.424$). Similar findings were shown in the EU Kids Online research, where the results were inconclusive between genders. On the one hand, boys were slightly more at risk of excessive internet use, showing higher levels of experience seeking. However, when boys had the same level of experience-seeking as girls, they were less likely to become addicted to the internet. Similar results were reported by Kavinda Gunathillaka, Chamara Wijesinghe, and Trivon Gunasekera (2021), and also Silvia Stefani and Sri Tiatri (2021), and the authors did not observe statistically significant differences between internet use and gender or age. David Šmahel (2012) explains this result by the fact that it is a complex process of factors acting in multiple ways on internet addiction.

Today's 'digital' children, who are, and will be, born into an information and communication society, see media as a natural part of life.

We are of the opinion that preventing children from using electronic media and the internet does not lead to the goal of prevention. An appropriate approach could be targeted education of the child user in the direction of acquiring digital competence, in which the child acquires the skills to use the internet correctly, to regulate the time spent on the internet and to be able to know the benefits and risks of the environment. This raises the question of guiding the behaviour of children and young people in the cyberspace created by electronic media, as well as preventing the risks of cyberspace and, consequently, possible risky behaviour in this virtual environment.

Schools can also play a role in reducing excessive internet using and internet addiction too, among pupils, as can teaching and professional staff. In the framework of primary prevention, the social pedagogue (as a school professional) acts on the pupil in a victimisation and patatorial way. The aim of victimisation prevention is to provide basic information on the safe use of the internet, observance of the rules of decent behaviour in virtual communication. The aim of prevention in the patatorial plane is to inform pupils about the possible negative consequences of antisocial behaviour within the virtual space and to prevent various forms of deviant behaviour, explains Mário Dulovics (2017). Mariya Dishakova and Romyana Papancheva (2019) point out that parental control is essential. This is relevant not only to prevent internet addiction, but also to guarantee the safety of pupils.

Secondary prevention is aimed at at-risk groups of pupils in whom there is a pre-suspicion of risky behaviour. In the framework of secondary prevention, the social pedagogue pays attention to pupils who are closed, marginalised and from disadvantaged social backgrounds. Understandably, the conducted research shows its limits. It would be appropriate to investigate other age groups of pupils in the questionnaire. One of the limitations is the methodology applied by us. Despite the fact that the methodology reflects the development of electronic media, due to the dynamics of its development, the reliability of the research instrument is rapidly being overcome.

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FIRE RISK ASSESSMENT OF PHOTOVOLTAIC PANELS BASED ON THE FAILURE MODE AND EFFECTS ANALYSIS

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Abstract: An increase in the use of alternative power sources results from the transition to a green economy and the reduction of greenhouse gas emissions. Their deployment contributes to increasing energy self-sufficiency and independence from other countries. Despite the highly positive effects associated with the operation of alternative power sources, it is necessary to pay appropriate attention to providing their operational safety. Using the Failure Mode and Effects Analysis method (FMEA), this paper assesses the causes and effects as well as estimates the Risk Priority Number of photovoltaic system failures possibly resulting in fire. The paper assesses the causes of fire in the manufacturing, transportation, installation and operation phases. The Failure Mode and Effects Analysis method allowed for estimating the Risk Priority Number, with the highest being estimated for six causes, including inverter failures, malfunctioning lightning protection and fuse box failures. In total, 20 different causes were assessed, of which more than 50% can be considered acceptable.

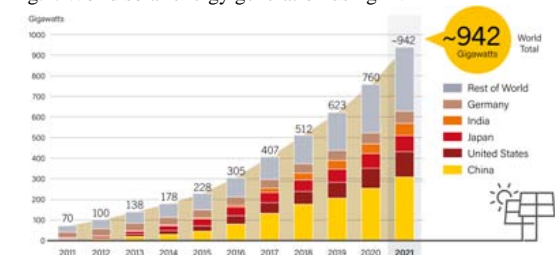
Keywords: Failure Mode and Effects Analysis (FMEA), fire, photovoltaic panels, risk, risk assessment.

1 Introduction and analysis of the current situation

The current security situation in the context of the military conflict in Ukraine, which has triggered an energy crisis accompanied by unacceptable increase in energy price and worsening climate change are the main reasons for the development of renewable energy sources. In the context of these circumstances, there is a growing demand for self-sufficiency of entities through autonomous systems of electricity provision, mainly in the form of photovoltaic power plants.

This is evidenced by the sharp increase in electricity generation through photovoltaics. In 2019, the total installed capacity of photovoltaic power generation worldwide was 623 GW. In 2021, the cumulative global capacity already exceeded 942 GW. In that year, the newly installed capacity was estimated at 175 GW, 36 GW more than in 2020 [1]. Figure 1 shows the countries with the largest cumulative photovoltaic power generation capacity in the world.

Fig.1. World solar energy generation using PV



Source [1]

Resulting of the increase in the installation of photovoltaic (PV) power plants, it is advisable to pay attention to the safety of their operation, particularly to fire safety. Failure of the functionality of PV power plants operation can cause a fire, which, by its destructive effects, can cause damage to the structures or their complete damage. Analyses of the causes of fire and failures have shown that PV systems are often installed without proper consideration of the fire spreading caused by the presence of modules, cables and electrical panels on the roof. PV modules are usually installed without considering the fire performance of the roof, especially in industrial and large warehouse facilities [2]. This leads to a violation of the fire requirements for such facilities or the systems not being included in the requirements.

Intentional and unintentional faults leading to PV system failure can occur during all stages of the PV system life cycle. The

design and installation phases of a PV system focus on efficiency, reliability, and obtaining the highest possible amount of solar energy that can be converted into electricity, which may be the reason why the designers of such systems do not sufficiently consider the risk of fire, similarly to the companies installing PV equipment [3]. The existence of PV power systems on buildings can increase or contribute to the already existing fire risk level since the PV power system components can affect the fire spreading outside or inside the building, interfere with smoke and ventilation systems, produce unwanted products of fire, obstruct firefighting, or even mean an electrical shock hazard to firefighters due to energized objects [2, 3, 4].

The flammability characteristics of the components that make up a PV system depend on two factors, namely the materials used and the way they are operated and installed. In addition, various materials and technical measures are implemented to the support structures of the PV systems themselves, depending on the manufacturing and installation companies. Research has been conducted on how the gap between the PV system supporting structure and roof affects flame spreading and fire resistance ratings of roofs and surfaces [5, 6, 7].

Based on the research conducted [3-7], opinions and discussions, standard development processes have been introduced within the professional community, resulting in the IEC TC 82 "Solar Photovoltaic Energy Systems" [8] and CENELEC TC 82 "Solar Photovoltaic Energy Systems" [9] guidelines at the international level.

The Italian Fire Department, for example, based on the above-stated standards has developed and implemented regulations focused on PV modules and rooftop connectors that include procedures for categorization when installing a PV system. These measures contain amendments to some Italian national technical fire response standards that have been developed in the past for products other than PV modules (e.g. wall panels) [4]. Similarly, Germany has also developed standards for fire and technical assistance and fire protection measures in electrical systems [10, 11]. The Czech Republic is currently updating regulations and standards for a more comprehensive approach to PV power plant installations and fire protection.

It follows from the above-stated facts that documentation governing the requirements for the installation and operation of PV systems on buildings represents a crucial basis for effective fire prevention. This should be based on the identification, analysis and risk assessment of PV systems carried out. It is preferable to choose quantitative or semi-quantitative methods providing higher accuracy within the context of the risk management application.

When selecting an appropriate method for PV system risk assessment, it is necessary to define the availability of input data, the experience and knowledge of the assessors with the method, and the output requirements. There are different methods and techniques for risk identification depending on the input data requirements, the experience of the assessors, the complexity of the assessment process, etc. There is no single "best or universal method" for risk identification. Methods should be used in an appropriate combination [12], or the one that best meets the input requirements should be chosen. Risk management should be used to identify the causes, and methods and techniques such as Checklist, Hazard Operation Process (HAZOP), Event Tree Analysis (ETA) and Failure Mode and Effects Analysis (FMEA), can be used among others [12, 13].

It was found, based on research of the available scientific literature [2-7] in the field of PV risk assessment, that the most commonly used are experiments, based on which conclusions, comparisons or FMEAs are made. A comparison was used according to selected criteria - input data and the complexity of

the process to select the appropriate PV risk assessment method. The comparison of the risk management methods and techniques widely used is presented in Table 1.

Tab. 1. Comparison of selected risk assessment methods and techniques

Name of method	Information intensity	Probability estimate	Risk level	Result of analysis
Checklist	High (Knowledge of conditions and measures is needed)	No	No	Qualitative
Hazard and Operability Study – HAZOP	High (It is a multidisciplinary technique)	No	No	Qualitative
Event Tree Analysis – ETA	High	No	No	Qualitative, quantitative in the case of a large number of input values
Failure Mode and Effects Analysis – FMEA	Medium	Yes	Yes	Quantitative

Source: author's own work [12-17].

The Checklist technique is used in the case of carrying out a systematic check of predetermined conditions and measures. This method is useful in an area in which the assessment team has deep experience, particularly for activities of a standard or routine character. In contrast, the HAZOP technique procedure is based on a probabilistic assessment of threats and the resulting risks. ETA technique is used for system reliability analysis and risk quantification since it illustrates the logic of combining probabilities and effects of sequences of events in a graphical representation. The analysis of failure modes and their effects, which allows the search for impacts and causes based on systematic and structured equipment failures, is solely enabled using the FMEA method [12-17].

The comparison results show that the ETA technique is the most demanding for input data, in case of a large number of input values, a quantitative result is needed to be obtained. The same is true for the HAZOP technique, which requires teamwork as it is a method used across the spectrum of experts. In the case of the Checklist, both a large amount of data and a high level of knowledge of the process are required, resulting in a qualitative result.

Considering the selection conditions set and the comparison of methods performed, the FMEA method was selected as the most appropriate method for risk assessment of PV systems. The application of the FMEA method is also suitable due to the research already conducted into PV system failures [18].

The aim of the paper is to identify the causes and effects of failures that can lead to fire hazards and to estimate the risk to the PV systems in operation using the FMEA method. The paper provides an opportunity to obtain relevant data for subsequent development and updating of fire safety regulations in the Czech Republic. A general model of the PV system operation was chosen for the purposes of the research described in the article.

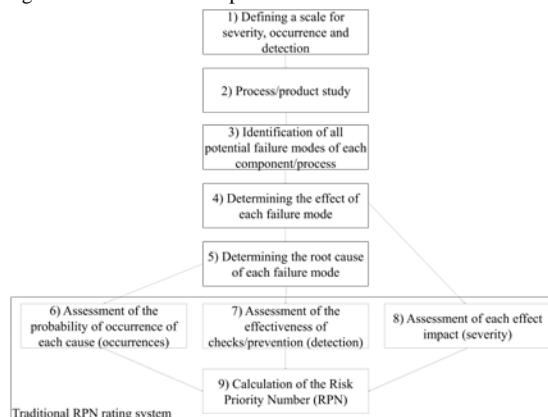
2 Data and methods used

There is no publicly accessible database for collecting information on failures, only partial or outdated information is available. Companies operating and maintaining PV power plants do not publish failure data. Results on identified failures were drawn from publicly published scientific research results or research published between 2010 and 2015 [18, 21-23] and for these reasons, the background information was based on publications available in 2000 [24], 2008 [25], 2010 [19], 2011 [20], 2012 [21, 22], 2014 [23] and 2015 [18].

Failure mode and effects analysis (FMEA) is an inductive and conservative approach to system reliability analysis. A system is a complex combination of components and sub-components

where technical and disciplinary interfaces are involved in their interactions. FMEA carries out an individual analysis of the sub-components of each system with the aim of identifying the different failure modes affecting each component with the causes and effects for the component itself and the whole system [18]. The traditional FMEA process is described in Figure 2.

Fig. 2. Traditional FMEA process



Source: modified by the author [17, 18]

The FMEA analysis must be carried out in steps according to the above-listed scheme, as each step builds on the previous one. An overview of the 9 steps in the FMEA process follows:

- 1) Defining a scale for severity, occurrence and detection - the scale was set as a scale from 1 to 10 (see Table 2), i.e. according to the established scale based on ISO 12132:2017 standard;
- 2) Process/product study - familiarization with available sources of information on PV system failure modes;
- 3) Identification of all potential failure modes of each component/process - identification of existing background materials and documentation/data on all possible failure modes, subsequently, the individual items were combined, as there are also several types of failures on individual parts of the PV system;
- 4) Determining the effect of each failure mode - identifying the individual impacts of failures on the end product (power generated) or on the following steps in the process or fire;
- 5) Determining the root cause of each failure mode - identifying the possible causes, which in this case were multiple;
- 6) Assessment of the probability of occurrence of each cause (occurrences) - the assessment was made on a scale from 1 to 10 (see Table 2), i.e. according to the established scale based on ISO 12132:2017 standard;
- 7) Assessment of the effectiveness of checks/prevention (detection) - this assesses the probability of a failure detection before it occurs;
- 8) Assessment of each effect impact (severity) - determined based on the severity of the effects of failures;
- 9) Calculation of the Risk Priority Number (RPN) - this is a product of three input factors: severity, occurrence and detection, which have been defined based on points 6 to 8 above. Subsequently, the failures with the priority given, i.e., the highest RPN, are chosen and a measure is proposed for them [16, 17, 18, 26-29].

Tab. 2. A rating scale for severity, occurrence and detection criteria

Severity	Occurrence	Detection	Assessment
Less severe	Very low	Very high	1
Not severe	Low	High	2, 3
Average	Medium	Medium	4, 5, 6
High	High	Low	7, 8
Very high	Very high	Very low	9, 10

Source: modified by the author [26]

3 Results and Discussion

Based on data obtained from professional sources [18-25], individual parts of the FMEA table (see Table 3) were elaborated using a qualified estimate with the primary focus on a technical failure, fire safety and personal safety.

Tab. 3. Analysis of failure modes and effects

No.	Potential failure	Possible causes	Possible failure effects	S	O	D	RPN
1	Loss of electrical functionality	Electric arc, exposed contacts	Fire, reduced operator safety, zero power generation	9	3	5	135
2	Electrical functionality Interference	PV panel ageing, overshadowing, PV panel pollution	Damage to PV panels, reduced power generation	7	2	7	98
3	Exposed contacts in modules	Disconnection of panels, incorrect installation, corrosion	Fire, zero power generation	9	1	5	45
4	Electric arc	Damaged insulation, lightning, damage by animals	Fire, damage to modules, zero power generation	9	1	3	27
5	Faulty contact	Material defect, ageing, oxidation	Reduced or zero power generation	7	1	7	49
6	Short circuit	Material defect, mechanical damage, electrical surge	Fire, reduced operator safety, overcurrent, reduced power generation	7	1	7	49
7	Diode damage	Material defect	Fire, reduced operator safety, reduced power generation, PV panel damage	5	1	7	35
8	Changing PV panel parameters	Material defect, ageing	Overcurrent, reduced power generation	4	1	7	28
9	Connectors opening	Vandalism, wind, failure to follow installation instructions	Zero power generation	9	1	3	27
10	Airtightness loss	Manufacturing defect, damage, snow load, lightning	PV panel damage, reduced or zero power generation	3	3	7	63
11	Loss of PV power plant configuration	Incorrect installation, damage	Reduced operator safety, PV panel damage, reduced power generation	7	4	1	28
12	Damage to supporting PV panel structure	Incorrect installation, material defects, weather effects	Unstable structure, damage/destruction of PV panels	6	4	3	72
13	Malfunctioning lightning protection	Incorrect installation, damage, corrosion	Reduced operator safety, module damage, reduced power generation	8	4	7	224
14	Tear and wear of PV panels	Material ageing, damage by animals, vandalism	Fire, zero power generation, reduced operator safety	9	1	3	27
15	Fuse box	Misconfiguration, design defect, improper maintenance	Fire, electric arc, reduced operator safety	9	1	8	72
16	Disconnection of the PV power plant	Misconfiguration, design defect, improper	Fire, reduced operator safety, zero power generation	9	1	5	45

		maintenanc e					
17	Circuit breaker	Defective switch, improper maintenance, design defect	Fire, reduced operator safety, zero power generation	9	1	7	63
18	Inverter	Contact failure, vandalism	Reduced or zero power generation	9	7	4	252
19	Transformer	Damage to insulation / structural parts, switch failure, ageing, improper maintenance	Fire, reduced operator safety, reduced or zero power generation	8	1	2	16
20	Protective relay	Incorrect setting, improper maintenance, ageing	Fire, reduced operator safety, overcurrent, reduced energy generation	8	1	4	32

Source: author's own work [18, 21, 23, 27]

The highest values of RPN were indicated by inverter failures and malfunctioning lightning protection, which result in, among other things, two primary failures, namely zero or reduced power generation. RPN values in the range of 98 - 50 were indicated for the circuit breaker or fuse box, as well as for the supporting PV panel structure or risks associated with the airtightness loss. Other failures have an RPN below 50, where, despite the high severity of the failure, the risk factor is not high due to, for example, a low occurrence probability or a high detection rate.

Based on the analysis performed, the inverter and malfunctioning lightning protection demonstrate the highest RPN which corresponds with the available scientific sources [18, 21]. In the case of the inverter, it is up for discussion whether this happens directly due to vandalism or possible damage within faulty connectors or contacts as reported by Köntges et al. [23] or Rieder [24]. On the other hand, for malfunctioning lightning protection, the author agrees with the results of other research teams [18, 21, 23], adding that in this case, the risk of fire is quite likely and the possible causes are influenced by both human factors and weather conditions.

The fuse box reached the fifth highest risk along with damage to the supporting PV panel structure. According to the results of the studies [18, 21], the level of risk was not rated at a similar level to the author of this paper. The justification for the higher rating was identified by the author based on the higher RPN for the inverter (faulty contacts) resulting in the impact on the fuse box [23, 24], and thus the effects in the form of fire prove to have higher probability levels.

A higher level of risk was also detected for the structural part of the PV system, more precisely the supporting structure of the PV panels, although neither Colli [18] nor Golnas [21] shares a similar view, for example, because of the lower probability and higher detection rate. From the author's point of view, the factor of damage to the PV panel structure cannot be omitted in the assessment. This is primarily because of the potential damage to the roof structure leading to roof collapse and also from the perspective of fire spreading. It has been proven, according to several experiments conducted on flammability and fire spreading under PV panels, that the height of the gap between the roof and the PV panel affects the heat and flame spreading [4, 30-33]. This is the reason for the higher value of the estimated risk.

4 Conclusions

The article dealt with the analysis of possible failures in PV systems that can have an impact both on the operation and the production of electricity, as well as on fire safety or the health of the operator of this equipment. In addition to the positive benefits of PV power plant operation, it is necessary to focus on the dangers arising from its operation or lack of maintenance. A

key operational risk is a fire, which affects both the PV system and the building on which it is installed. The safe operation of PV systems has to be based on regulatory legislative acts and other fire protection regulations, which are not, however, sufficiently developed in the Czech Republic.

The article, therefore, focused on risk assessment, in particular the causes that can trigger a fire. The possible individual failures were described within the article and their level of risk was assessed with respect to their severity, occurrence and detection. Each failure was analysed based on the three above-mentioned factors and rated on a scale of 1 to 10. The Risk Priority Number RPN was subsequently calculated and the failures with the highest RPN were discussed.

It is essential, regarding the results of the risk assessment, that safety features and systems for detecting fire occurrence were taken into account in the design and manufacturing phases of the PV system. Load testing or the use of modelling tools to test the resilience of individual system components should be implemented as part of the PV system test operation. The PV system operator should regularly monitor and assess the frequency of individual failures and their impact on power generation.

Correct identification of failures and root causes (those with a high occurrence or high severity) can help in decision-making already during the design, construction and subsequent operation phases. It has been proven that the inverter represents the most vulnerable component of a PV system. Manufacturers will likely improve the functionality of this component and the others with regard to the permanent development and improvement in safety and reliability. This is indicated by Golnas' findings published in his 2013 study [21].

The issue of gaps between the roof structure and the PV panels needs to be added/incorporated into the national standards, as it has not been addressed yet. Determining a minimum gap height shall reduce the spread of heat and flame between individual components. This has been proven by several studies [4, 30-33]. Another recommendation is to deal with the roof surfaces on which the PV systems are located, due to their degree of flammability, which for the time being is only addressed by recommendation and is not an obligation during installation.

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ENTREPRENEUR PREPAREDNESS TO THE DEVELOPMENT OF PROBABLE SUCCESSORS IN ENTREPRENEURIAL ORGANIZATION: SCALE DEVELOPMENT AND VALIDATION

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Abstract: Preparedness of an entrepreneur with regards to development of his probable successors especially for key roles is not only critical and important keeping in view the long-term business success but also to remain competitive. This research paper presents the creation and verification of the entrepreneur preparedness to the development of probable successors in Entrepreneurial Organization engagement scale, as tested on a sample of 150. The respondents included Leadership Team, Heads of Human Resources and senior management team members of the organizations belonging to 48 organizations due to the involvement of senior management of these organizations and homogeneous nature of the population. The basis of selection was their entrepreneurial orientation. The organizations are more than a year old to maximum of 90 years old. Organizations which were selected belonged to across industries irrespective of national geography as the meaning of entrepreneurial orientation remains same in any industry. Sampling of participants focused primarily on role of respondents in succession planning for probable successors in their organizations. The scale is a 19 item self-reporting questionnaire (1 was dropped as it was irrelevant) that measures four facets of development of probable successors with regards to Statements that represent preparedness of Entrepreneur with regards to the development of probable successors in entrepreneurial Organization. The test-retest reliability and internal consistency of the subscales were both quite good. All the dimensions of development of probable successors were positively and significantly related. The results of EFA rendered 3 distinct factors namely; Leadership Commitment to Planned succession, Communication of Planned succession to probable successors, Succession decisions directed by Family concerns, values and norms. These factors were then checked for construct validity and discriminant validity followed by structural model fit assessment.

Keywords: Indian Entrepreneur, Preparedness, Development, Probable Successors, Entrepreneurial Organization.

1 Introduction

For entrepreneurial organizations to be successful, development of probable successors, is very critical. Every key position and key person in an organization should be part of succession planning (The Hindu, 2017). The process of creating potential successors must be proactive rather than reactive. Preparedness of entrepreneur is willingness on part of an entrepreneur to develop, mentor, train, and groom probable successors. Due of this, business owners must plan for the future while still focusing on the here and now. Mr. O.P. Jindal, the founder of the Jindal Group, had ensured a seamless transition of the family business to the next generation during his lifetime itself, by passing on one each of his four companies to each of his four sons (Mishra, Shukla, & Sujatha, 2021). Large corporate houses with succession plans include the Godrej Group, Mahindra & Mahindra, Dabur, and the Murugappa Group. Some of the more progressive Indian business houses like Ranbaxy, Dabur, RPG and the Eicher Group have demonstrated a high degree of professionalism in this regard. Multi-dimensional components emanating from socialization in family-business and experiences garnered through external sources support the commitment of successors (Mishra, Shukla, & Sujatha, 2021). But one common point in all the literature's is that probable successors preparedness had only been possible with the support and commitment of entrepreneur. Probable successors preparedness is not very well planned by companies (Nupur et al., 2017). Succession determines a leader's long-term worth (John C. Maxwell). The continual process of selecting candidates to take over the most important positions in a company and preparing them for those leadership positions is known as succession planning (Atwood, 2020). An organization's deliberate and methodical attempt to maintain leadership continuity in important positions, to preserve and grow cognitive and intellectual assets for the future, and to promote individual progress is known as succession planning. (William Rothwell, 2016).

There are barriers and gaps in development of probable successors. A third of Indian businesses either do not have a succession planning programme in place or have one that is ineffective, hence it is mostly absent in these businesses (KPMG, 2014). 28% of the businesses either had no succession planning in existence or their procedure was completely ineffective. The problems associated with succession planning seem acute in India where family-managed businesses proliferate. According to analysts, it is nearly a guarantee that the successor in Indian promoter-driven enterprises would be a relative. In India, family-run companies are more likely to choose a "number two" somebody to assist their family-nominated CEO (KPMG). This continued to be the case with the majority of significant corporate houses, like the Birla's, which began as modestly sized businesses around four or five generations earlier. Boston Consulting Group research throws light on the extent to which poor succession planning can lead to bad results in revenue generation, market capitalization and margins. Their study was specifically focused on family-owned businesses in India. Based on literature review there are many issues in entrepreneur's preparedness for development of probable successors which are unaddressed, leading to a wide gap between the critical aspects with special reference to Indian context. Literature in the Indian context is still rare and specific, which leaves huge gaps in this research area. The majority of research that have been published in the literature took place in developed economies. Since there is significant impact of environment, culture, economy etc. on entrepreneurial organization behaviour, therefore the preparedness aspect, related intentions and behaviour are different. Also, in India, not much of the work has been accomplished on this topic and whatever work has been done; its scope is too narrowly limited to a section of organization. All research available on Entrepreneurial Organization's, in India repeatedly fail to address succession planning. This reflects a strategy of playing safe and not experimenting much and therefore not addressing the selection of probable successors.

Thus, the questions are:

- What is the preparedness level of an entrepreneur with regards to development of probable successors?
- What is the preparedness level of probable successors with regards to development of self?

For entrepreneurial organizations to be successful, development of probable successors by himself as well as entrepreneur's, is very important. It remains a critical an area to be explored, assessed, and taken care off. Also, as it is clear from the review of literature's, much of the work is done abroad. In India, not much of the work has been accomplished on this topic and whatever work has been done; its scope is too narrowly limited to a section of organization. Developed probable successors will be able to take future leadership responsibilities & challenges within the organization as Chief Executive Officer etc.

2 Review of Literature

2.1 Entrepreneurial Organization

Structures that foster the birth and growth of ideas from all of the firm's employees are known as entrepreneurial organisations. Such a group must possess particular qualities that encourage the emergence of opposing viewpoints. An entrepreneurial organisation combines a number of entrepreneurship and resolute adaptability elements, including a specific attention process that enables junior and experienced managers to catch the attention of decision makers, a particular decision process that explains the acknowledgement of suggestions, and a versatile, flexible framework to enable implementation. By virtue of their form and traits, entrepreneurial organisations vary from management organisations. (Thierry Burger-Helmchen,

2013). Entrepreneurial organization can take numerous forms. Several academics have emphasised the fact that there is no one feature, tendency, or group of qualities that can reliably anticipate entrepreneurial activity at the level of the individual entrepreneur. (Sandberg et al., 1987). The organisational and environmental traits of a company will be significant logical consequences of the organizational innovation that a particular organisation has chosen. (Lumpkin et al., 1996). The personalities of the founders of a firm may also be linked to entrepreneurial inclination. In the past, the entrepreneurial qualities of accomplishment drive, tolerance for ambiguity, risk-taking, and locus of control were examined and shown to be correlates with becoming or wanting to be an entrepreneur. (Ahmed, 1985; Begley et al., 1987; Bonnett et al., 1991). Different authors have addressed entrepreneurship in various ways over the years. This is due to the fact that the topic has been studied by the broadest range of human sciences: among other things, sociology, psychology, administration, and the economy. Entrepreneurial mindset is found as one of the factors associated with Intrapreneurship and intrapreneurship is independent of age and education (Rekha et al., 2015). The most influential businessmen of the world possess the following leadership qualities: they do not play the victim card; are open-minded; prepared to take calculated chances; establish realistic objectives; and know how to handle difficulties. Can inspire others, is proactive, a lifelong learner, asks thoughtful questions, is ready to take a break, gathers information before making a choice, is aware of their strengths, and hires for their deficiencies. (John, 2015). The boundary between entrepreneurial leadership and refraining from making impulsive judgments is not clearly drawn in start-ups. (Henning, 2014). The entrepreneur recognized and pursued an opportunity. These individuals have ventured into business creating niche and unique position for themselves.

2.2 Succession Planning

The continual process of selecting candidates to take over the most important positions in a company and preparing them for those leadership positions is known as succession planning (Atwood, 2020). The development of an organization's bench strength through succession planning helps assure its long-term health, prosperity, and security (Teala Wilson). An organization's deliberate and methodical attempt to maintain leadership continuity in important positions, to preserve and grow cognitive and wisdom assets for the future, and to promote individual progress is known as succession planning (William Rothwell, 2016). Despite its importance, it was mostly ignored in the past by all, including human resource management function. Even though the entrepreneur or top management understands the importance of succession planning, there is no policy and process for implementation of the same. Many businesses appear to be letting succession planning be up to chance. (Rhoda et al., 2018). According to a Hay Group research report released in 2013, only one-third of family businesses in India, which are entrepreneurial in nature have succession plans in place. Since 2014 till today the trend in succession planning has been issue-driven in different types of businesses:

- Scarcity of the right talent and the right number of incumbents at the executive level.
- Flatter organizations which in turn have created huge pressure on organization structures to downsize, leading to limited scope at higher levels.
- With the new generation, individuals were more loyal to their careers instead of to a job, which reduces loyalty to work.
- Reward & recognition are the new system of every organization.

As a result, many organizations have transitioned to succession planning being an agile process, that identifies and develops a pool of talented individuals who can assume future roles built around organization's vision; mission and business value system, which are competency driven.

2.3 Preparedness of Entrepreneur on Planning for Succession

It is the role of an entrepreneur to assist the stakeholders in their business. Serendipity is obtained via expansion and success. As a result, company owners must think about the present while making plans for the future. The preparation for succession planning is also influenced by the leadership styles of entrepreneurs. Veterans of the Indian family-owned business firm started the success management method more than ten years ago and give sons and daughters the same opportunities. There is not a precise information instrument available to assess an entrepreneur's preparation for succession planning. In Indian businesses, succession planning is frequently lacking, with around one in three having either no programme in place or an ineffective one. (KPMG, 2014). Leadership preparedness is not very well planned by companies (Nupur et al., 2017).

2.4 Preparedness on part of Probable Successors in Succession Planning & Self Development

What lies within us is far more important than what is in front of us or behind us (Ralph Waldo Emerson). The process of analysing important responsibilities and assessing the level of preparedness of possible internal (and external!) candidates to fill these roles is known as succession planning. It is a significant procedure that serves as a vital link between talent acquisition and recruitment. Potential is the capacity of an individual to exhibit the behaviours required for success at the organization's next highest level. A future employee may be fairly accurately predicted by their skills and behaviours. No of their level, higher-potential applicants frequently exhibit the following talents: business savvy, strategic thinking, leadership, abilities, learning agility, and technological proficiency. The ultimate objective of succession management is to create a pool or pipeline of ready leaders across all organisational levels, not merely a list of potential candidates, to fill openings in critical roles as necessary. Which resource—to construct or to buy—would be the best fit to fill this function, according to some potential questions? Do those applicants require training? If so, what kind, exactly? Even if the person directly behind them in the organisational hierarchy may be the apparent choice to fill a position, do not rule out other deserving applicants. As a result, career planning and development are crucial to the succession management plan's individual employee career goals and objectives (Darina et al., 2015). Simply said, interactions between individuals—who choose what best suits their ideas—and the organisation providing them with such alternatives that achieve their goals are what lead to career growth. The connection between career advancement, career planning, and career management reflects this dual goal (Chvostaova, 2015). Employees may establish and put into practise the stages and processes necessary to attain their professional goals through career planning. Career management is connected to career planning since it's a process used by businesses to identify, assess, and cultivate prospective talent that can be used to satisfy their needs, maintain their competitiveness, and provide them with alternatives that help them achieve their goals. (Bielikova, 2008). One of the company's strategic goals is career planning, which is where the company's strategic goals begin. Utilizing all available data on business needs, job performance and potential assessments, and succession plans for managerial roles, it creates customised career development plans and broad management development, consulting, and career mentoring arrangements (Armstrong, 2007). Research on the function of successors in self-development is quite scarce.

3 Components to Probable Successor Development in Entrepreneurial Organizations

Research Construct	Variables
Preparedness of Entrepreneur on Planning for Succession	Commitment & Readiness to Change; Business Continuity; Resources; Open Communication & Trust; Competence of Successor; Time & Opportunity; Autonomy; Nurturing Conflict
Preparedness on part of Probable Successors in Succession Planning & Self Development	Successors Initiatives; Readiness; Self Development

The tool for measurement of variables with regards to preparedness of entrepreneur to the development of probable successors in entrepreneurial organization is not available and this is the first time we are proposing the same. The below-mentioned indicators were carefully made after consultation with the experts and are analysed as LED1 TO LED 20:

1. Entrepreneur of my organization shows willingness to planned change in key role positions (LED1).
2. The succession planning policy helps entrepreneur to align business vision, mission & business plan with the development of probable successors for leadership positions (LED2).
3. The entrepreneur is aware on the impact of successor on the business continuity. (LED3).
4. The entrepreneur of my organization is committed to development of probable successors for key positions (LED 4).
5. The entrepreneur of my organization devotes financial resources for the growth and development of its probable successors (LED5).
6. The willingness of the entrepreneur to step aside is often communicated through organizational stories within my organization (LED6).
7. It is informed by the entrepreneur that for a succession to be successful, the successor's competence and experience must be taken into account in any entrepreneurial organizations (LED 7).
8. The entrepreneur demonstrates the emotional implications of the transition plan (LED 8).
9. Resources in terms of time and opportunity are made available by entrepreneurs for learning and development process of probable successors (LED9).
10. Entrepreneur provides lot of autonomy to Human Resources team to undertake succession planning process in my organization (LED10).
11. The entrepreneur foresees nurturing conflict in circumstances of succession from one generation to the next (LED11).
12. As a properly run business with diversified shareholding, the objective of succession is predominantly understood as the firms post succession performance (LED12)
13. There is preparedness with the leadership to balance the difference in the values, norms and goals between a family succession and an outsider succession in leadership roles (LED 13).
14. Maintaining good family relationships have been the interest of the entrepreneur in the succession planning (LED 14).
15. The entrepreneur puts conscious efforts to ensure transparent communication with the probable successors within my organizations (LED 15).
16. Entrepreneur considers propensity to trust with probable successors as the most important factor in identifying a successor (LED 16).
17. The selection of the successor is based on the optimum match of the successor to the existing family values and norms (LED 17).
18. The entrepreneur is very careful not to surrender power, authority, responsibility and control if the successor initiates the succession process (LED 18).
19. The Discussion and agreement on how the founder transfers ownership and administration of the company to the successor are governed by mutuality of interest (LED 19).
20. In my organization the leadership have been communicating the succession decision to stake holders (LED 20).

4 Research Method

4.1 Scale Refinement

The study used a sample of 461 Entrepreneurs or Leaders and Senior Management team members from various organisations. The author selected the respondents based on certain criteria; first, the organisation is at least one year old, and leaders have an entrepreneurial orientation. Organizations which were selected belonged to across industries irrespective of national geography

as the meaning of entrepreneurial orientation remains the same in any industry.

The Sampling frame consisted of senior members of these organizations having rich experience of the field with an average experience of 12-17 years and more. In July 2018, the author started searching for entrepreneurial organizations wherein Entrepreneur; Head of Human Resources and Senior Management team members, who can give interviews and provide the relevant information to understand the entrepreneur's preparedness in these organizations with regards to succession planning of probable successors. From July 2018 to March 2019, interviews were fixed, and their views were taken. A scale for measuring Entrepreneur Preparedness to the development of probable successors in Entrepreneurial Organization was created after multiple expert brainstorming sessions along with the literature available on the subject. The initial draft consisted of 24 items and the content was further presented to three faculty members and two industry experts. Their recommendations led to the removal of 4 items from a scale, bringing the number of final items down to 20 as mentioned in the previous section . A scale from 1 to 5 was used to rate each item, with 1 being labelled as "strongly disagree" and 5 as "strongly agree".

Post-these interactions, a self-administrated tool with 20 items (LED 1 to LED 20) was used as a pre-testing tool. The questionnaire was sent to the Entrepreneur; Head of Human Resources and senior management teams of different organizations through emails, Google Docs.; LinkedIn and what's app link. The items along with the definitions of Entrepreneurial Organization; Succession Planning; Preparedness of Entrepreneur and Preparedness of Probable Successors were presented to 48 senior members of the selected organizations to get their opinion on whether the items belonged to the proposed study. 510 responses were received and out of which 461 questionnaires were in a usable form as the rest had missing responses.

4.2 Development of Measurement Scale

Reliability

The study used SPSS version 21.0 and AMOS 16 for the statistical analysis of data. The data was first checked for sample adequacy through KMO and Barlett's sphericity test. The KMO score in the current research was 0.925, which is higher than the minimal cutoff value of 0.50. (Hair, 2006). Barlett's measure, which has 4196.123 as its value and 171 degrees of freedom, was determined to be extremely significant (p 0.001). As a result, it was determined that the sample was suitable and appropriate for factor analysis to be applied to the data.

Common method variation is a significant problem that comes up while collecting data on self-report measures. Harman's single factor approach, which loads all the elements onto one factor using an unrotated factor, was used to test this (Podsakoff et al., 2003). In order to ensure that there were no difficulties with common method bias in the data set, it was discovered that the percentage of the total variation accounted by the single greatest component was 32.867.

The properties of the scale were checked by Principal Components Analysis using Varimax Rotation for Factor Analysis. As a criterion for factor extraction, factors with eigenvalues bigger than one were taken into consideration. c The LDE15 measured "The entrepreneur puts conscious efforts to ensure transparent communication with the probable successors within my organizations" was removed from the analysis due to low factor loading (Nunnally, 1978).

The remaining 19 items loaded on three factors; thereby explaining the multidimensionality of the construct. The results of EFA rendered 3 distinct factors namely:

Factor 1: Leadership Commitment to Planned succession (LED1 to LED9)

Factor 2: Communication of Planned succession to probable successors (LED 10 to LED14)

Factor 3: Succession decisions directed by Family concerns, values and norms (LED 16 to LED20)

The items in the questionnaire focused on the willingness of the entrepreneur to change amid a defined succession planning policy, which brings forth the commitment towards the succession process. The work by Rautamaki and Romer-Paakkanen (2016) highlighted the importance of commitment and willingness in the process of business succession. Further on, the business continuity is mentioned as an item of influence in the process. In the work by Weisblast (2018) it is concluded that the development of the probable successors by the entrepreneurs add to the positive business continuity. In doing so, the resources like finances, time and opportunity are to be made available by the entrepreneur. LeCounte (2020) stated that the entrepreneur is required to exhibit willingness and inevitability of succession while acknowledging the emotional aspect of transition. These parameters bring forth the need for commitment from the leader's end towards succession, which is how the first factor emerges.

The questionnaire also focused on the ability of the entrepreneur to handle, manage and oversee the succession. The work by Lu et al. (2021) discusses the need for the entrepreneur to communicate the necessity of the succession to the organization's employees. As the succession planning is communicated, the entrepreneur needs to take care of the emerging conflicts and distribution of ownership when the successor is from outside the family (Leib & Zehrer, 2018). To balance all the aspects properly and ensure effective succession process while balancing out the outsider succession and maintaining good family relationships; communication is integral. Therefore, the discussed five items become the fundamentals for the second factor i.e., communication of planned succession.

The remaining items on the questionnaire catalyze the third factors i.e., succession decisions directed by family concerns, values and norms. It is imperative of the entrepreneur to trust the probable successor (Camfield & Franco, 2019) while also selecting the one who is the most suitable match (Campopiano et al., 2020). Only when there is an adequate match in the interest of the successor and the entrepreneur, can the planning see an outcome. The succession planning is to be done with adequate planning wherein entrepreneur remains the central decision-maker while clarifying the decisions made to the stakeholders, adding to the list of items forming a part of the succession process.

Consequently, first factor consists of nine items and second and third factor consists of 5 item each. All the factors were then checked for reliability using Cronbach Alpha, values of which ranged from 0.861 to 0.901. Minimum five items in each factor ensured parsimony of the scale items that helped in minimising respondents biasness while answering the questions (Clark and Watson, 1995)

Factor	Component	Communalities	Factor 1	Factor 2	Factor 3	Eigen value	% of variance	Cummulative %	
Factor 1	LED 1	.531	.720			6.907	36.351	36.351	
	LED 2	.544	.692						
	LED 3	.556	.730						
	LED 4	.597	.752						
	LED 5	.586	.746						
	LED 6	.556	.735						
	LED 7			.716					
	LED 8			.752					
	LED 9			.728					

LED 7	.546	.716
LED 8	.594	.752
LED 9	.548	.728

Table 1: Explanations of factor loadings, communalities, dependability, and total variance

Factor	Component	Communalities	Factor1	Factor2	Factor3	Eigen value	% of variance	Cummulative %
Factor 1	LED 1	0.531	0.72			6.907	36.35	36.351
	LED 2	0.544	0.692					
	LED 3	0.556	0.73					
	LED 4	0.597	0.752					
	LED 5	0.586	0.746					
	LED 6	0.556	0.735					
	LED 7	0.546	0.716					
	LED 8	0.594	0.752					
	LED 9	0.548	0.728					
Factor 2	LED 10	0.63		0.771		2.937	15.46	51.807
	LED 11	0.666		0.787				
	LED 12	0.621		0.751				
	LED 13	0.654		0.779				
	LED 14	0.644		0.769				
Factor 3	LED 16	0.696			0.899	1.784	9.391	61.197
	LED 17	0.674			0.776			
	LED 18	0.643			0.75			
	LED 19	0.668			0.789			
	LED 20	0.674			0.782			

The reliability scores of all the factors are shown in Table 2 below:

Table 2: Reliability of the factors

Factors	Mean	Standard Deviation	No of Items	Cronbach Alpha
Factor 1	3.5770	.95283	9	.901
Factor 2	3.5965	1.01278	5	.861
Factor 3	3.4764	1.04010	5	.876

Table 3 shows that items of all the factors are positively and significantly related to its total score.

Table 3: Correlations of the Items of the Factor with its Total Score

Factor	Items	Mean	Standard deviation	Correlation
Factor 1	LED 1	3.55	1.270	.720**
	LED 2	3.61	1.319	.692**
	LED 3	3.56	1.261	.730**
	LED 4	3.60	1.260	.752**
	LED 5	3.55	1.301	.746**
	LED 6	3.57	1.255	.735**
	LED 7	3.58	1.230	.716**
	LED 8	3.58	1.308	.752**
	LED 9	3.59	1.268	.728**
Factor 2	LED 10	3.60	1.264	.794**
	LED 11	3.56	1.249	.812**
	LED 12	3.61	1.251	.790**
	LED 13	3.61	1.275	.808**
	LED 14	3.61	1.278	.804**
Factor 3	LED 16	3.52	1.279	.831**
	LED 17	3.43	1.257	.819**
	LED 18	3.50	1.259	.804**
	LED 19	3.47	1.276	.813**
	LED 20	3.46	1.288	.822**

Source: Authors' findings.

Note: **P < 0.01.

Scale Validity

After the factor analysis consisting of the 17 significantly loaded items was subjected to CFA using AMOS to determine whether the three-factor model of Entrepreneur Preparedness to the development of likely successors in Entrepreneurial Organization was appropriate for our chosen sample, the 19 items from the factor analysis were subjected to CFA. The study considers the scale as a reflective as the observed indicators are not measured directly and are caused by latent variables. For construct validity, it is important to examine the items, their dimensionality and the relationship of the items with the constructs, which can be either formative or reflective (Polites, Roberts and Thatcher, 2012).

According to studies, the majority of measurement development activities often take into consideration reflective measurement

models, which make the assumption that the latent variables are what produce the observable indicators. The current study considers the construct as reflective by following the checklist (Khatri & Gupta, 2019):

First, by investigating whether the items or indicators forming the construct define the characters of the factors (formative) or manifests the items (reflects). Examination of the items reveals that they manifest the construct, which suggests it is a reflective scale.

Second, we examine if any changes to the components cause a specific change in the construct's meaning. In other words, the direction of cause and effect can help in deciding whether the construct is reflective or formative. Third, it was seen that the items are linked to each other, for example, The indicators are related to each other, so any change in one item can affect another item, suggesting the construct to be reflective.

Construct Validity and Discriminant Validity

Further, both construct and discriminant validity of the scale is calculated using stats tool package.

Construct composite reliability, convergent and discriminant validity calculations on 19 items were used to define the measurement model and goodness of fit (Hsu and Lin 2008; Lim 2015). Composite reliability is used to gauge a construct's dependability (Fornell and Larcker 1981). The lower limit for composite dependability should be more than 0.70, according to (Liu and Wang 2016).

AVE (average variance extracted) and component loadings are used to assess the construct's convergent validity (Fornell & Larcker 1981). The factor loading should have a value of more than 0.60 and the average variance extracted (AVE) must be larger than 0.50. (Hair et al.,2014) All constructs have value of AVE ranging from 0.504 to 0.586 (> 0.50) and Convergent validity of the questionnaire is not a concern. The value of CR is greater than AVE, which is further greater than the values of MSV (mean shared values), thereby confirming no convergent validity issues (Table 4).

Table 4: Construct and Discriminant Validity

	CR	AVE	MSV	MaxR(H)	Factor1	Factor2	Factor3
Factor 1	0.861	0.554	0.276	0.862	0.744		
Factor 2	0.901	0.504	0.171	0.902	0.367	0.71	
Factor 3	0.876	0.586	0.276	0.877	0.525	0.414	0.766

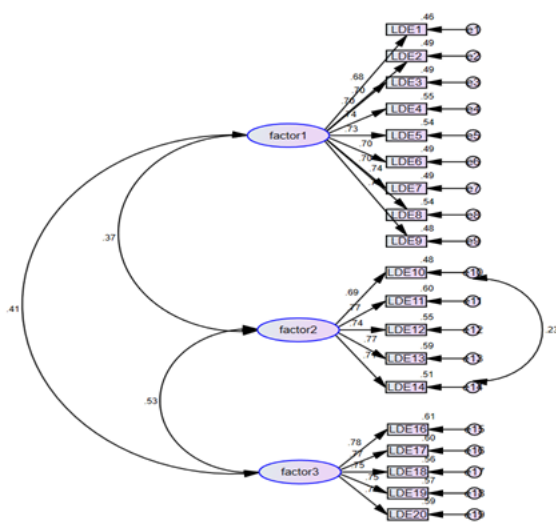


Figure 1: Confirmatory Factor Analysis

Fornell and Larcker (1981) claim that the correlation of constructs and the square root of average variance extracted

(AVE) are used to determine the discriminant validity of the scale. A few academics have disputed this, though (Benitez, Henseler, Castillo, and Schubert 2019; Fornell and Larcker's 1981), and it is no longer regarded as an appropriate indicator of discriminant validity. Heterotrait-Monotrait (HTMT) ratio should be utilised to evaluate the construct discriminant validity, according to Henseler, Ringle, and Sarstedt's (2015) recommendation. The HTMT ratio should be less than 0.85 (Henseler et al. 2015; Benitez et al. 2019; Ogbeibu, Senadjki, and Gaskin 2018). The HTMT ratios of the study's components ranged from 0.365 to 0.526 (0.85; see Table 5), demonstrating that discriminant validity remains unaffected.

Additionally, various model fit indices, including the Chi-Square (2), Relative Chi-Square (2/df), Root Mean Square Residual (RMR), Root Mean Square of Error Approximation (RMSEA), Comparative Fit Index (CFI), Adjusted Goodness of Fit Index (AGFI), and Normed Fit Index, were used to evaluate and quantify the structural model goodness of fit (NFI). In table 5, the model goodness-of-fit indices are displayed. The values for the model fit indices (See Table 5) were discovered to be within acceptable limits, with excellent model fit values being CFI = 0.984, NFI = 0.950, and TLI = 0.982. In line with the suggested thresholds of other investigations, RMSEA = 0.031 and SRMR = 0.052 showed high model fitness (Hair et al. 2014; Vieira 2011; Hu and Bentler1999; Tanaka 1993). The threshold requirements are met by all fit indices. As a result, the structural model appears to suit the data well and may be used further.

Table 5: Model fit Indices

Indices	Estimate	Threshold
CMIN	213.723	--
DF	149	--
Relative Chi-Square (χ ² /df) (CMIN/DF)	1.434	Between 1 and 3
Comparative Fit Index (CFI)	0.984	>0.95
Square Root Mean Residual (SRMR)	0.052	<0.08
Root Mean Square of Error Approximation (RMSEA)	0.031	<0.06
Normed Fit Index (NFI)	0.95	>0.90
TLI	0.982	>0.90

5 Discussion

Although the concept of Succession Planning in the form of development of probable successors in any established business organization is not a new concept but it is equally relevant for Entrepreneurial Organizations globally. Leadership continuity is the backbone of any business organization. So, the focus of all entrepreneurial organizations should be to develop probable successors for all key roles. However, succession planning gets significantly impacted by environment, culture, economy etc. on entrepreneurial organisation behaviour, therefore the preparedness aspect, related intentions and behaviour are different. Also, in India, not much of the work has been accomplished on this topic and whatever work has been done; its scope is too narrowly limited to a section of organization. In order to assess an entrepreneur's readiness for the growth of potential successors in entrepreneurial organisations, the current study piece suggests a scale.

Succession determines a leader's long-term worth (John C. Maxwell). The continual process of selecting candidates to take over the most important positions in a company and preparing them for those leadership positions is known as succession planning (Atwood, 2020). An organization's deliberate and methodical attempt to maintain leadership continuity in important positions, to preserve and grow intellectual and knowledge capital for the future, and to promote individual progress is known as succession planning. (William Rothwell, 2016). As per Rothwell (2011), An organization's intentional and methodical attempt to maintain leadership in important positions, preserve and build intellectual and knowledge capital for the future, and promote individual progress is known as succession

planning. According to a 2014 Stanford study, many firms failed to develop definitive plans because they lacked the necessary skills within their organisations, and they identified effective succession planning as a significant obstacle. Only about half of these businesses had a specific executive in mind who was being prepared for a more senior role, and more than 39% of businesses stated that no current employees met the necessary requirements to fill these positions. According to a more recent Gartner study from 2019, just 27% of the business units examined had the executives they required for the future, a far less certain future than the one we presently have. Despite its importance, it was mostly ignored in the past by all, including human resource management function. Even though the top management understands the importance of succession planning, there is no policy and process for implementation of the same. Many businesses appear to be letting succession planning be up to chance. (Rhoda et al., 2018). According to a Hay Group research report released in 2013, only one-third of family businesses in India, which are entrepreneurial in nature have succession plans in place. These successions for years have been passed on to the next generation of the family. As a result, the majority of firms were not even considering succession planning. For a number of reasons, including as lack of senior management support and engagement, divergence from other business processes, time and resource needs, and a strong focus on planning with little responsibility for implementation, these procedures continue to be scrutinised. Traditional Succession Planning strategies have been rendered outdated by rapid change and organisational developments. Since 2014 till today the trend in succession planning has been issue-driven in different types of businesses:

- Scarcity of the right talent and the right number of incumbents at the executive level.
- Flatter organizations which in turn have created huge pressure on organization structures to downsize, leading to limited scope at higher levels.
- With the new generation, individuals were more loyal to their careers instead of to a job, which reduces loyalty to work.
- Reward & recognition are the new system of every organization.

As a result, many organizations have transitioned to Succession Planning being an agile process, that identifies and develops a pool of talented individuals who can assume future roles built around organization's vision; mission and business value system, which are competency driven. The same holds true for entrepreneurial organizations.

The current work is a preliminary investigation in the growth of a scale to measure Entrepreneur Preparedness to the development of probable successors in Entrepreneurial Organizations. Although the present study is first of its kind, it's not a full-fledged study because a bigger sample size is needed, but it's a beginning attempt to look at the characteristics of a tool that is intended to assess Entrepreneur Preparedness to the development of probable successors in Entrepreneurial Organizations. It gave proof of the instrument's validity and dependability. The various subscales' reliability—both internal consistency and test-retest reliability—was good. The subscales' test-retest reliability was likewise quite good. Both face validity and predictive validity were demonstrated in terms of validity.

The criterion variable and the predictor variables were found to be significantly related. The subscales created and verified in this research can be useful for entrepreneurs as head of their organisation and Human Resource professionals. They can use them to measure preparedness of entrepreneurs to the development of probable successors in Entrepreneurial Organizations and analyse the findings. After obtaining findings, Numerous preparedness-related measures, including development efforts for potential successors, can be started. Qualitative data acquired through interviews and focus groups may be used to further verify and support quantitative data generated through a survey. This scale may also be used as a

proximate indicator of a potential successor's desire to prepare for a new position. Future studies can look at our scale in relation to different organisational configurations. The instrument's structure can also be examined by employing a sizable sample. Additionally, the subscales' validity may be checked in relation to a number of additional results.

This study will also help Indian Entrepreneur's and Human Resources to work on Talent Management Strategies including, Build or Buy option. It will also help entrepreneur's overall business strategy, his vision to develop successors. Developed successors will be able to take future leadership responsibilities & challenges within the organization as CEO; Strategic Business Unit Head / Vertical Heads. Entrepreneurial organizations will also be able to remain competitive.

6 Limitations and Future Research

As it is clear from the review of literature's, much of the work is done abroad. In India, not much of the work has been accomplished on this topic and whatever work has been done; its scope is too narrowly limited to a section of organization. The majority of research that have been published in the literature took place in wealthy nations. Since environment, culture, economics, and other factors have a considerable influence on entrepreneurial organisation behaviour, the readiness component, related objectives, and behaviour will need to alter. Hardly any study has been reported on Indian scenario. The need of such study arises because India howsoever rich in its natural wealth is fast moving towards being an economic superpower. Increased competition has increased the worth of such a study. So, to understand this about organization is of foremost importance. So, the preparedness and progress of organizations needs to be studied. Also, this needs to be tested on a larger sample population.

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Primary Paper Section: A

Secondary Paper Section: AE, AN, AO

IMPACT OF SHORT-TERM EDUCATIONAL ACTIVITIES ON PUPILS' ATTITUDES TOWARDS WASTE IN DISTANCE EDUCATION

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Abstract: The aim of the work was to apply short-term educational activities to primary school pupils and to find out their influence on pupils' attitudes, compared to the traditional way of teaching. We observed differences between the cumulative mean scores of girls ($x = 2,1$) and boys ($x = 2,4$). We showed no difference in the cumulative mean scores of 7th and 8th graders. The pre-test data were at the level of statistical significance ($p = 0,0521$), with the experimental group (E) performing worse on mean score ($x = 2,61$) than the control group (K) ($x = 2,31$). The values correlated with the end-of-year grade in the biology and chemistry subjects. A paired *t* test revealed a statistically significant difference in the experimental group between the cumulative means of the pre-test and post-test ($p = 0,0419$) and the pre-test and retention test ($p = 0,0354$). A statistically significant difference was also observed in the individual dimensions (separation, recycling and production). In the control group, there was no statistically significant difference between the individual tests and dimensions. We have demonstrated the effective use of inquiry-based learning during the Covid-19 pandemic.

Keywords: inquiry-based learning, waste, environmental education, primary school, Covid-19

1 Introduction

The constructivist model or approach in teaching is based on the creation or construction of knowledge and one's own reality by students. Situations induced during the classroom activate pupils, continuously requiring them to engage in activities and problem solving (Tomengová, 2012). Svobodova (2013) states that pupils find science subjects unpopular and uninteresting. These findings may be related to the heavy emphasis on rote memorization in contemporary schooling. It further states that pupils possess knowledge but cannot apply it in practice. To motivate pupils, to apply knowledge in practice and to acquire competencies, changing the role of the pupil to that of a scientist may be helpful. The shift from traditional deductive to inductive-exploratory teaching requires pupils to take initiative in measuring, experimenting, observing, analysing, hypothesising, modelling and verifying. Such an oriented teaching promotes motivation, self-confidence and collegiality (Holec et al., 2010). The application of inquiry-oriented teaching requires a change in the mindset of both the students and the teacher (Stuchlíková, 2010). According to the Centre for Inquiry-based Learning, inquiry-oriented teaching is a multifaceted approach in teaching, for the acquisition of knowledge, skills and competencies. Furthermore, it is a tool for students' active work in the classroom, a tool for defining and solving problems, and a simulation of scientific and research work (Dyasi, 2000). The process of research requires the involvement of all the senses, at the same time, its essential part is the search for information, interpretation and analysis of data (Janoušková et al., 2008). Wenning (2005) developed a table that includes the exploratory level of the pupil and the intellectual difficulty of the tasks. According to Eastwell (2009), there are different ways of exploration: confirmatory, structured, directed and open-ended exploration. In our work, we used confirmatory and structured exploration. Vybiralova et al. (2005) define waste as an unnecessary product or substances that we do not want or for certain reasons cannot be used anymore. Waste threatens all biotic and abiotic components of the environment (e.g. water, soil or air) (Chmielewská et al., 2011). According to Bočková (2004), the first step in solving the waste problem is to prevent its generation. Next comes reuse, recycling and composting,

incineration (i.e. its energy recovery) and lastly landfilling. According to Milova et al. (2011), despite the replacement of the subject curriculum of environmental education by its cross-cutting theme, the application of this cross-cutting theme is insufficient. Chmielewska et al. (2011) state that increasing the interest of pupils and teachers in environmental education by alternating organizational forms and methods in the classroom can contribute to improving this situation. Also Šimonovičová et al. (2011) cite teacher preparation as one of the important tasks in environmental education. Eliašová and Eliáš (2009) consider environmental education in primary schools in Slovakia to be the least satisfactory. These authors further state that traditional verbal knowledge acquisition prevails over creative knowledge acquisition in primary schools. The aim of our research was to apply an inquiry-based model of teaching in the cross-curricular topic of environmental education for 7th and 8th grade primary schools and to find out its impact on all components of pupils' attitudes in comparison with the traditional way of teaching. Another aim was to test the effect of short-term educational activities on attitudes of primary school students and to determine the difference between grades and gender, and to validate the inquiry-based model of teaching during the Covid-19 pandemic in distance education. The aim of the research was to determine the difference in scores obtained between the experimental and control groups and to compare different teaching methods in practice.

1.1 Methods

The pedagogical experiment took place at the BESST Primary School, Limbová 3, 917 02 Trnava. Before the experiment we prepared a model of an inquiry-oriented lesson and a model of a traditional lesson. Both of these models are based on one of the most well-known environmental problems of today, the topic of waste. We implemented both lesson models in 8th and 7th grade of primary school. We selected four classes of 7th and 8th grade. There were 121 respondents, pupils, represented in the research, due to the non-participation of pupils throughout the research, some respondents were excluded. We evaluated data from 45 respondents, 22 of whom were girls and 23 of whom were boys. There were 21 pupils in the experimental group with a representation of 12 boys and 9 girls. The control group consisted of 24 pupils with a representation of 11 boys and 13 girls (Table 1).

Table 1. Characteristics of the research sample.

group	total number	gender		year in school	
		girls	boys	7	8
experimental	21	9	12	8	13
control	24	11	13	12	8
use respondents	45	22	23		
respondents contacted	121				

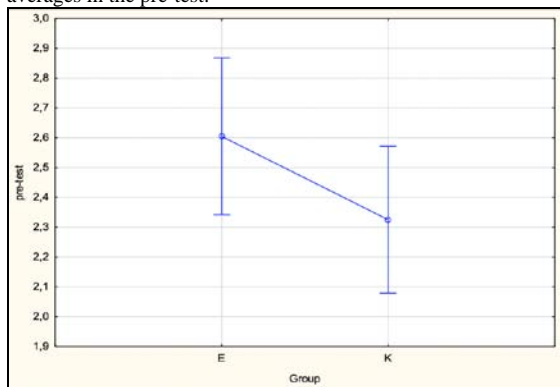
According to Bartlett et al. (2001), a sufficient number of respondents to determine differences is 118. Salkind (1997), states that respondent losses during research can account for 40-90% of the original size, so it is important to increase the research sample. Both groups followed the same procedure in the SPP. The students of both groups were used to the traditional way of teaching with the use of explanation, innovative methods in teaching and the use of information and communication technology during the lessons. Their motivation to think for themselves was positive, dominated by logical reasoning. Due to the small number of respondents, it is not possible to generalize the data obtained to the whole population. Our research is of a recommendatory nature; the issues outlined and their implementation in practice require further experimental scrutiny. In the experimental group, we implemented teaching through an inquiry-oriented model of the lesson while in the control group,

traditional teaching was carried out using the teaching method of interpretation. The teaching was conducted during one week in all the classes based on the timetable of each class. To test the effectiveness of inquiry-based teaching in the process of primary school education, we used a questionnaire that was made available to the pupils before the experiment in the form of a pre-test, after the experiment in the form of a post-test and one month after the experiment in the form of a retention test. The questionnaires were completed anonymously by the pupils under a code number provided by the school. The numerical code was verified by the teacher, a member of staff at the school where the experiment was conducted. The teacher ensured that the same code for the pre-test, post-test and retention test was always given to the same pupil. The list of codes and names was destroyed after the experiment. The questionnaire consisted of 32 Likert scale questions, with choices (strongly agree, agree, have no strong opinion, disagree, strongly disagree). The research instrument contained cognitive (questions 2, 3, 4, 7, 10, 11, 12, 25, 30 and 32), affective (questions 5, 8, 9, 13, 15, 19, 22, 23, 26, 28 and 31) and conative attitude components (questions 1, 6, 14, 16, 17, 18, 20, 21, 24, 27 and 29). After the experimental part of the research, we focused on students' evaluation of inquiry-oriented and traditional teaching. We administered attitudinal questionnaires to both experimental and control group pupils. Out of 45 respondents, 35 reported that their school also implements similar activities, while 10 respondents reported that they do not implement similar activities at school or are not aware of it. We based the evaluation of the instrument on the scale levels (1- very significant, 2-significant, 3-somewhat significant, 4-significant, 5-significant not at all significant).

1.2 Results

The measured data were subjected to statistical analysis using Statistika 12 and Microsoft Excel Version 16.49/2021. The students' ratings of the individual lesson models reached the mean ($x= 2,5$) in the control group and the mean ($x= 2,1$) in the experimental group. This shows that the experimental group evaluated the teaching process more positively than the control group. We conducted a normality test using the Shapiro-Wilk test. Further, we compared the mean scores of the answers obtained in the pretest, posttest, and retention test, between the experimental and control groups. The dependent variable was the test scores obtained. The cumulative mean score of girls was higher ($x= 2,1$), compared to the cumulative mean score of boys ($x= 2,4$). There was no difference in the cumulative mean scores of 7th and 8th graders. The pre-test data were compared at the level of statistical significance ($p= 0,0521$), with the experimental group (E) performing worse on the mean score ($x= 2,61$) than the control group (K) ($x= 2,31$) (Figure 1).

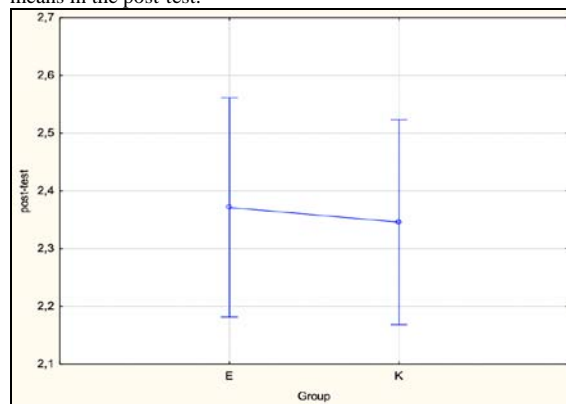
Figure 1. Comparison of experimental (E) and control (K) group averages in the pre-test.



These values correlate with the end-of-year grades in biology and chemistry, with the experimental group's mean grade in biology and chemistry being ($x= 1,23$) and ($x= 1,41$), respectively. The control group's mean grade in the subject biology was ($x= 1,09$) and in the subject chemistry was ($x=$

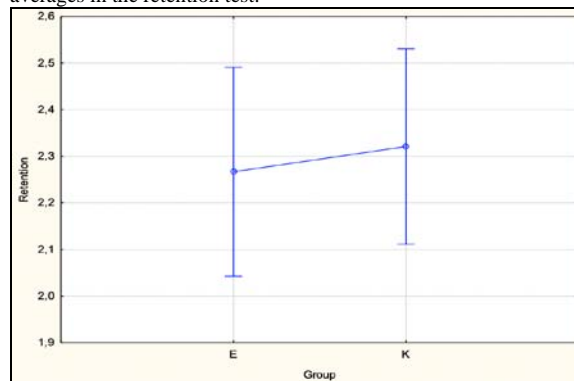
1,08). The post-test data were not at the level of statistical significance ($p= 0,8437$), with the experimental group achieving comparable mean cumulative scores ($x= 2,37$) to the control group ($x= 2,35$) (Figure 2).

Figure 2. Comparison of experimental (E) and control (K) group means in the post-test.



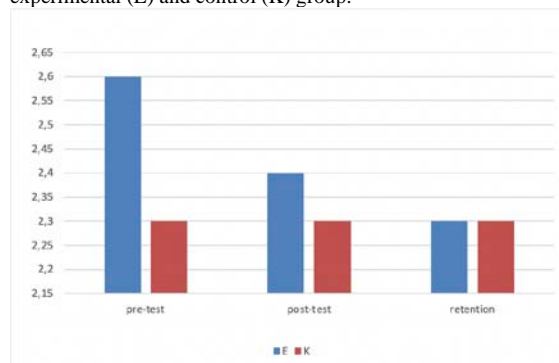
The retention test data were not at the level of statistical significance ($p= 0,7235$), with the experimental group achieving comparable mean cumulative scores ($x= 2,31$) to the control group ($x= 2,25$) (Figure 3).

Figure 3. Comparison of experimental (E) and control (K) group averages in the retention test.



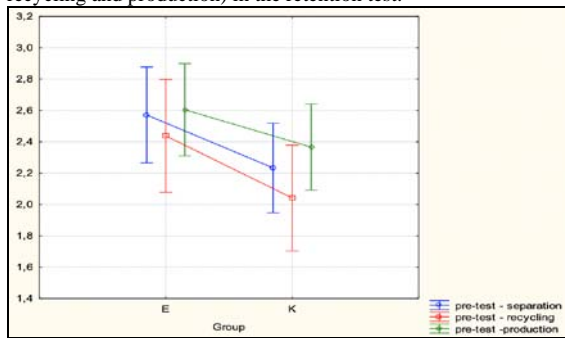
In Figure 4, we present a comparison of the cumulative scores between the experimental and control groups.

Figure 4. Comparison of cumulative mean scores between experimental (E) and control (K) group.



We used measurement tools to identify students' attitudes along three dimensions (separation, recycling and production) (Figure 5).

Figure 5. Students' attitudes in the three dimensions (separation, recycling and production) in the retention test.



The pre-test data between the experimental and control groups were not statistically significantly different (Table 2).

Table 2. Students' attitudes in the three dimensions (separation, recycling and production) in the post-test.

separation	recyclation	production
p= 0,1107	p= 0,1121	p= 0,2406
F= 2,6523	F= 2,6309	F= 1,4158

We implemented the same procedure in the post-test (Figure 6). The post-test data were not statistically significantly different either (Table 3).

Figure 6. Students' attitudes in the three dimensions (separation, recycling and production) in the post-test.

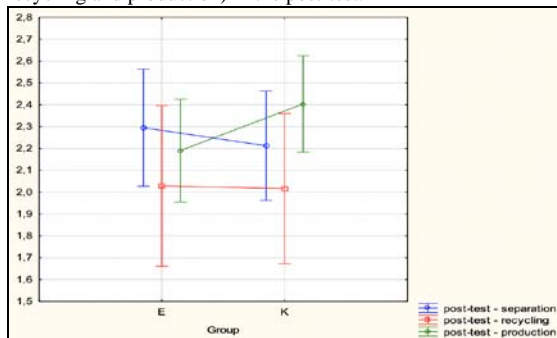


Table 3. Students' attitudes in the three dimensions (separation, recycling and production) in the post-test.

separation	recycling	production
p= 0,6517	p= 0,9621	p= 0,1883
F= 0,2066	F= 0,0023	F= 1,7868

We implemented the same procedure for the retention test (Figure 7). We did not find a statistically significant difference in the retention test either (Table 4).

Figure 7. Students' attitudes in the three dimensions (separation, recycling and production) in the retention test.

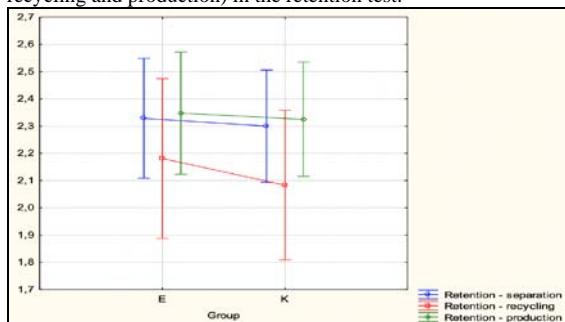


Table 4. Students' attitudes in the three dimensions (separation, recycling and production) in the retention test.

separation	recycling	production
p= 0,8491	p= 0,6265	p= 0,8825
F= 0,0366	F= 0,2402	F= 0,022

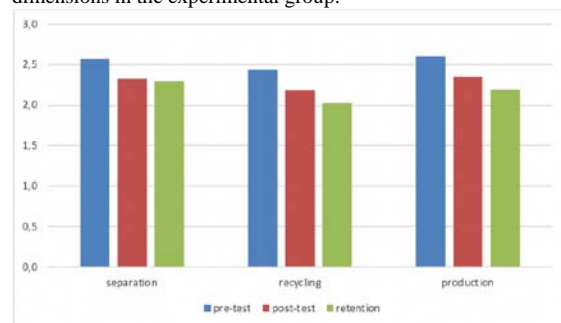
The obtained data were further processed by a paired sample t-test to verify the effectiveness of the implemented activities, comparing the cumulative means between the tests and dimensions (Table 5).

Table 5. Paired t-test comparison.

Experimental group	p- value
pre-test vs. post-test	0,041959
pre-test vs. retention	0,035426
post-test vs. retention	0,941554
pre-test - separation vs. post-test - separation	0,034063
pre-test - recycling vs. post-test - recycling	0,057116
pre-test - production vs. post-test - production	0,054638
post-test - separation vs. retention - separation	0,587338
post-test - recycling vs. retention - recycling	0,453705
post-test - production vs. retention - production	0,375093
Control group	
pre-test vs. post-test	0,979690
pre-test vs. retention	0,095448
post-test vs. retention	0,100461
pre-test - separation vs. post-test - separation	0,392797
pre-test - recycling vs. post-test - recycling	0,323256
pre-test - production vs. post-test - production	0,799532
post-test - separation vs. retention - separation	0,152678
post-test - recycling vs. retention - recycling	0,193700
post-test - production vs. retention - production	0,266877

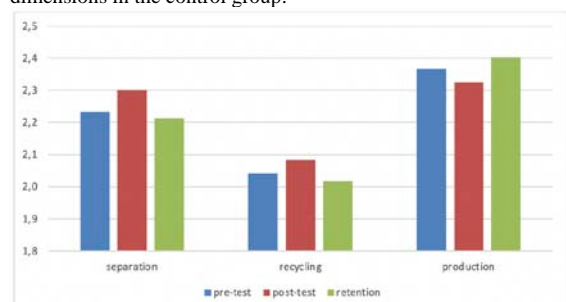
There was a statistically significant difference in the experimental group between the cumulative means of the pre-test and post-test (p= 0,0419) and the pre-test and retention test (p= 0,0354). There was no statistically significant difference between the cumulative means of the post-test and retention test (p= 0,9415). A statistically significant difference was also observed in the individual dimensions. There was a significant difference between pre-test and post-test in the separation dimension (p= 0,0340), pre-test and post-test in the recycling dimension (p= 0,0571) and pre-test and post-test in the production dimension (p= 0,0546) (Figure 8).

Figure 8. Comparison of mean scores of the observed dimensions in the experimental group.



In the control group, there was no statistically significant difference between the tests and dimensions (Figure 9).

Figure 9. Comparison of mean scores of the observed dimensions in the control group.



2 Discussion

In this study, we found a positive effect of a 1-day learning activity on cognitive, affective, and conative components of attitudes in 7th and 8th grade students. Our data correlate with the teaching method in the experimental group. The pre-test data between the experimental and control groups were at the level of statistical significance ($p = 0.0521$), with the experimental group (E) scoring worse on average ($x = 2.61$) than the control group (K) ($x = 2.31$). These values correlated with the end-of-year grades in biology and chemistry, with the experimental group's mean grade in biology and chemistry being ($x = 1.23$) and ($x = 1.41$), respectively. The control group's mean grade in the subject biology was ($x = 1.09$) and in the subject chemistry was ($x = 1.08$). The post-test data were not at the level of statistical significance ($p = 0.8437$) between the experimental and control groups, with the experimental group achieving comparable mean cumulative scores ($x = 2.37$) to the control group ($x = 2.35$). The retention test data between the experimental and control groups were not at the level of statistical significance ($p = 0.7235$), the experimental group achieved comparable mean cumulative scores ($x = 2.31$), as the control group ($x = 2.25$). The data obtained were further processed by a paired sample t-test, and we observed a statistically significant difference in the experimental group between the cumulative means of the pre-test and post-test ($p = 0.0419$) and the pre-test and retention test ($p = 0.0354$). There was no statistically significant difference between the cumulative means of the post-test and retention test ($p = 0.9415$). A statistically significant difference was also observed in the individual dimensions. There was a significant difference between the pre-test and post-test in the separation dimension ($p = 0.0340$), the pre-test and post-test in the recycling dimension ($p = 0.0571$), and the pre-test and post-test in the production dimension ($p = 0.0546$). In the control group, there was no statistically significant difference between the tests and dimensions. Based on the data obtained, we conclude that the significant improvement in scores in the experimental group between the pre-test and post-test indicates an improvement in attitudes and a positive effect of the validated teaching method in the experimental group. The positive impact of inquiry-based teaching with a scaled questionnaire was also demonstrated by Sotáková (2018), who found an increase in the cognitive and conative components of attitudes in students at both levels of primary school. The positive impact of short-term teaching was also confirmed by Kvasničák et al. (2013) who found a positive impact of a 5-day short-term course on pupils' knowledge, Easton and Gilburn (2012) who found a positive impact of a 10-day course on pupils' knowledge and attitudes, and Knox et al. (2003) who found a positive effect of a 14-day course on pupils' knowledge and attitudes. From the measured data, we further note the durability of the changes in the attitudes of the pupils in the experimental group, as indicated by the retention test data obtained with a time lag of 1 month after the post-test. We did not observe a statistically significant difference between the post-test and the retention test in the experimental group. Similar conclusions were reached by Kvasničák et al. (2013), Kvasničák et al. (2005) and Prokop (2007). We found a more positive evaluation of the teaching method in the experimental group by means of an evaluation questionnaire. The cumulative mean was higher in the control group ($x = 2.5$) than in the experimental

group ($x = 2.1$). Many authors have addressed the evaluation of the teaching process by pupils through questionnaire (Schreiner & Sjöberg, 2007; Ambusaidi & Beggs, 2006; Awan et al. 2011). Sotáková (2018) evaluated structured interviews with teachers and pupils after completing an inquiry-oriented lesson. Her results show an increase in teachers' and pupils' positive attitudes towards inquiry-oriented teaching. Karolčík (2020) evaluated pupils' perceptions of inquiry-oriented teaching in geography teaching, and the results show positive perceptions of the reported method in primary schools, especially in the areas of cooperation among classmates and pupils' individuality. The positive impact of pupils' active work, linking theory with practice and the importance of informal teaching was also confirmed by Prokop (2007). When analysing the impact of short-term exploratory activity of pupils compared to the traditional model of teaching, we found that the cumulative mean score of girls was higher ($x = 2.1$), compared to the cumulative mean score of boys ($x = 2.4$). Zeidan (2010) and Jones et al. (2000), find that girls have higher preferences for the subject of biology compared to boys, which may be related to the values we measured. They further note that girls tend to be more inclined towards biology and humanities subjects and boys with a technical subject. We showed no difference in the cumulative mean scores of 7th and 8th graders. Cheung (2009), Mandíková (2009), Kaya and Böyük (2011), and Barnes et al. (2005) reached similar conclusions when examining students' attitudes. (2005). Galková and Kotuláková (2019), in their research involving Year 7 pupils (24 in the experimental group and 24 in the control group), demonstrated the positive impact of inquiry-oriented teaching on science literacy. The results showed an improvement in science process skills among low-performing students in the experimental group, which is consistent with our results. Further, Sandika and Fitrihidajati (2018) addressed the enhancement of skills and scientific approach through inquiry-oriented teaching in primary schools. The result of the research showed an increase in students' positive attitudes and improvement in students' scientific skills in the subject of biology. It can also be concluded that the research conducted demonstrated the effective use of inquiry-oriented teaching during the Covid-19 pandemic, with the lesson model used in the experimental group positively impacting all three components of students' attitudes despite distance learning. Our findings are supported by the work of Kurniawan et al. (2021). Appropriately chosen teaching methods in schools that are prepared for distance education can effectively influence pupils' attitudes during a pandemic.

3 Conclusion

The present work highlights the impact of short-term educational activities focused on waste on the knowledge and attitudes of primary school pupils. Our conclusions are in line with those of the above mentioned works. The main problems we see in the implementation of waste issues in education, within the cross-cutting theme of environmental education, include:

- (1) The use of outdated teaching methods in biology classes, the passive reception of information by students, without the possibility of involvement.
- (2) Focusing on the cognitive component of students' attitudes, preferably in the area of knowledge of the correct way to sort waste. Absence of waste prevention activities.
- (3) Creating misconceptions about how to tackle the increasing amount of waste by sorting it correctly. Lack of depth on the topic in the educational programme and linking theory to practice.

The use of inquiry-based learning is seen as a promising framework for providing active engagement of primary school students in Years 7 and 8 on the topic of waste. At the same time, we consider the validated teaching method to be an effective tool to activate students during the Covid-19 pandemic, and the lesson model used in the experimental group positively influenced all three components of students' attitudes despite distance learning. Appropriately chosen teaching methods in schools, in conjunction with information and communication

technologies, can effectively influence students' attitudes towards waste, during a pandemic.

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Primary Paper Section: A

Secondary Paper Section: AM

THE DENISON ORGANIZATIONAL CULTURE SURVEY (DOCS): EMPIRICAL REVIEW OF A DIGITAL ORGANIZATIONAL CULTURES' EFFECTIVENESS

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Abstract: Digitalization presents a driving force for many organizations regarding the dynamic changes and requirement of a new way of thinking and achieving higher performance, improving quality, safety, and profitability. Digital transformation has become a prevalent project in many industries, nevertheless often failure due to inhibit organizational cultures preventing change. Empirical review of the digital organizational cultures' effectiveness identifies cultural traits that are crucial for the digital transformation process. Understanding the digital organizational culture is important for leaders to react to changing environments, especially amplified by the ongoing coronavirus pandemic. The purpose of the study is to assess the culture of organizations and track the progress of digitalization using the Denison organizational culture model. The survey was conducted in October 2022. The sample comprised over 400 respondents. Statistical analysis is performed with MAXQDA software, where the statistical relationship between the variables of interest was explored. Convergent validity was evaluated using Person's correlation analysis. A psychometric evaluation is acceptable and correlation confirms the statement that each trait strongly correlates with two other traits, but less with the incompatible trait. The correlation between particular traits and their subdimensions indicates the convergent and divergent validity of the items. The findings have revealed a significant connection between Adaptability and Customer Experience and Mission and Digital Strategy. These traits highly affect the digital evolution within an organization. Findings reveal that the organizational culture is crucial to a successful digital transformation and needs to be given sufficient attention. In conclusion, this study indicates that organizational culture appears to be a force that boosts digital progress.

Keywords: Denison organizational culture survey; organizational culture; digitalization; digital transformation

1 Introduction

There is no doubt that organizational culture plays a key role in creating a balanced and sustainable work environment that ensures increased employee satisfaction and lower employee turnover. This aspect is becoming even more important in addition to offering various employee benefits in order to attract employees in the labor market, especially during the time of low unemployment rate. Therefore, organizational culture is a tool not only to strengthen and expand teams, but also to ensure continuity in human resources discipline. Nowadays, some authors go even deeper and connect organizational culture with the concept of happiness at work as its basic building stone (Foncubierta-Rodríguez, 2021; Badibanga and Ohlson, 2021; Mamen, 2018). The concept is based on a simple principle of satisfaction of employees, and based on their satisfaction, they perform better and in the long run.

From a business management perspective in the first decades of the 21st century, the digitalization of processes is a key trend related to Industry 4.0. A company that is on a higher level of digitalization and has already learned how to deal with the ICT ecosystem and strategy has an enormous advantage. Such a company holds a competitive advantage; its deliverables are faster, better quality, and created with lower efforts and costs. That is the reason why companies in several industries and specializations build ICT teams and search for experienced experts who are able to set and maintain the ICT strategy. This brings, next to inefficiency in processes, also the risk of losing know-how and knowledge when the employee leaves.

It is important to mention that the digitalization process is not only about the deployment and implementation of any application or information system. It also covers the existing environment where the part of the ICT ecosystem is implemented. It means preparation of infrastructure in case the company decides not to go IaaS¹ strategy but primarily to prepare the users. It is necessary to realize that the level of user digital literacy is different depending on the industry in which the company operates and the age group that prevails among employees and future end users. That is why key and end user

training plays a crucial role in the schedule of implementation projects and successful deployment of information systems. The behavior of the aware companies amplifies the scissor effect between digitalized organizations and those that still rely on pencil and paper and are reconciled to the fact that most of the knowledge and data are stored in the memories of the employees.

When thinking about how the situation has changed due to the global pandemic and its impact in the form of a perceptible increase in remote collaboration and work from home, it is indisputable that the importance of digitalization is increasing. However, it is necessary to mention that the pandemic significantly changed the relationship between digitalization and organizational culture. In the past, digitalization was a part of it. It stayed beside other aspects, as a piece of fragments that put together the organizational culture of every particular company. Nowadays, digitalization needs to be perceived as a crucial factor for achieving realization of organizational culture. In other words, it is not easy to enforce and spread the principles of organizational culture when teams work much more remotely. It is obvious that organizations that started with their digital transformation are in a significantly advantageous situation as they already have their infrastructure and ICT environment ready for spreading and supporting the organizational culture remotely.

2 Methodology

The research deals with the impact of organizational culture on digital transformation within organizations. Therefore, the aim of the research lies in assessing the organizational culture of particular companies and, at the same time, tracing the level of the corporate digitalization. Thus, the research question is as follows: What is the connection between organizational culture and digital transformation? To achieve this result, the Denison Organizational Culture Survey has been chosen as the most widely used questionnaire in a wide range of research worldwide.

The Denison Organizational Culture Survey (DOCS) is based on a theory linking four major cultural traits, such as involvement, consistency, adaptability, and mission (Denison and Mishra, 1995). The involvement is represented by the personal engagement of individuals reflecting the internal organizational dynamics and flexibility. The consistency is connected with core shared values, an ability to reach agreements within the organization, and coordination and integration of the organization. The adaptability presents the degree of understanding of the needs of the organization of the customers, specifically the response to changing demands. The mission refers to organizational purpose and direction (Denison et al., 2013). These four organizational aspects were identified by several authors in the past that consider them as characteristics of high performance of every community (e.g., Spreitzer, 1995). The model consists of two-dimensional perspective – external vs. internal focus and flexibility vs. stability (Denison and Neale, 1999). The Denison model includes the digital assessment part that focuses on the progress of the organization's digitalization and includes six components: digital strategy, people, customer experience, production and delivery, and infrastructure (Denison Consulting, 2020).

The reason why exactly this survey tool has been chosen is that DOCS is the result of methodological research that identified several problematic trends and remaining gaps in nine chosen published surveys. The objective of these surveys is to diagnose organizational culture and assess digitalization. The DOCS reacts on pointed troubles with reliability and validity and is designed to be the most well-researched effectiveness instrument to date (Denison et al., 2012). The design of the survey is in direct agreement with the aim of the investigation as it consists of questions related to the topics of the organizational culture

¹ Infrastructure as a service.

and the level of digitalization in the researched environment. The questionnaire consists of 66 statements divided into 5 dimensions. These dimensions include sub-dimensions:

1. involvement - empowerment, team orientation, capability;
2. consistency - core values, agreement, coordination and integration;
3. adaptability - creating change, customer focus, organizational learning;
4. mission - strategic direction and intent, goals and objectives, vision;
5. digital assessment - digital strategy, people, customer experience, innovative products, production and delivery, infrastructure;

The survey consists of closed-ended questions using a Likert scale. Respondents demonstrated how they agree or disagree with a particular statement on the scale from 1 (strongly disagree) to 5 (strongly agree) (Jamieson, 2004).

Within the descriptive statistics, statistical indicators such as mean and standard deviation were used. Cronbach's alpha examines the internal consistency and reliability of test items. In addition, demographic analysis of the respondents has been used.

Statistical analysis is performed with MAXQDA software. It allows us to explore the statistical relationship between the variables of interest. The next step lies in the assessment of convergent validity by Person correlation analysis. The basic property of the Pearson correlation coefficient is that it only takes values from the interval, with the value being positive when higher values of the random variable are associated with higher values of the random variable and conversely negative when lower values are associated with higher values. The survey was conducted in October 2022 and includes a sample of 494 Czech companies. The research involves representatives of employees in companies as participants and consumers of organizational culture of a business community at some particular level of digitalization.

3 Definition and Relationship between Organizational Culture and Digitalization

Nowadays, organizational culture is an integral part of every corporate environment. It is one of the first mentioned aspects when identifying or describing a company. The organizational culture is an important factor for employees finding a new job, customers deciding about new contracts and suppliers, and owners identifying strategy, vision, and values of their companies. It simply enters into the whole corporate ambience.

According to Denison and Neale (1999), organizational culture refers to the underlying values, beliefs, and principles that serve as a foundation for a management system of organizations. They also add the remark that aspects of organizational culture are divided into visible and invisible. The visible ones are easy to observe. Those that are invisible are represented by values and core beliefs. The definition of organizational culture has much older roots. Katz and Kahn (1978) described organizational culture as a set of roles, norms, and values. Next to this, there are new definitions of organizational culture that work with new terms, but indeed their description is similar. Schein (1996) describes organization culture as a phenomenon embedded in employees related to life and work in the organization consisting of relations among employees and the set of values. The Kahn definition is followed by Sikavica (1999) who sees it as a system of values, understandings, beliefs, and assumptions. This definition slightly extends the original formulation. A little bit more modern concept is offered by Žugaj et al. (2004) who speaks about organizational culture as a specific mode of behavior and the lifestyle of groups within organizations that create the organization as a whole. Whether we perceive organizational culture from a narrower or broader perspective, there is no doubt that it plays a key role in the identification of every organization.

Digitalization is a moving force that, as a result, means a change in the quality of the organizational systems functions performance (Gayer et al., 2022). This anticipates the relationship between the recipients and the digitalization itself. The fact that digitalization results in changing processes and responsibilities can sometimes be an obstacle that slows down innovation because people are naturally afraid of changes. On the other hand, the change of outcome quality, higher performance, or savings due to digitalization are catalysts of the digitalization process. Every process change can be successful only when the balance between supporters and consumers of the change is maintained. As mentioned by Kryštal et al. (2022), the impulse to get the organization to the higher level of digitalization mostly comes from the employees dealing with the strategy of the company and are decision makers requiring enough data to make correct decisions. The same category of managers is usually responsible for the economic result of the company, which motivates them to also be interested in digitalization, which is often described as a tool to realize savings. There is no doubt that the digitalization process is becoming more and more popular. According to Teece (2010), it is mainly caused by high levels of competition, increased customer focus, economic challenges, market connectivity, advancement in technologies, and crises. As the date of publication is before the COVID-19 crisis, the quote seems to be quite visionary. Many authors (Skulmowski and Rey, 2020; Porpiglia et al., 2020; Dannenberg et al., 2020; Chesbrough, 2020) confirm increased interest in digitalization during and after the pandemic, as expected. This fact even drives more the naturally increased demand for ICT tools that can be demonstrated on, for example, the growing number of companies using ERP systems (Špatenka and Koch, 2021). It is evident that digitalization and organizational culture are current factors present in every corporate environment in some form an extent.

Provided that digitalization and organizational culture are two phenomena that exist side by side, an important part of the research in general is to identify the relationship and possible causality between each other. According to Binh et al. (2022), organizational culture is an essential factor of enhancing the quality of digitalization in Vietnamese companies that participated in the research, especially in the way of improving quality of accounting information systems outcomes that help to make accurate managerial decisions. The opposite direction of the relationship is described by Coman et al. (2022) on the case of accounting agenda as well. It is said there are three main factors influencing decisions about digitalization: organizational culture, infrastructure, and optimal configuration of the functional structure. Carlsson et al. (2022) confirm that the most important relationship between these two aspects lies in the importance of a sufficiently adapted organizational culture that supports the process of digitalization. They also connect the culture with the focus on learning and the ability of employees to know how to acquire competence. The importance of the learning process, especially achieving and adopting digital skills as a part of organizational culture, is also highlighted by Barquero et al. (2021), whose survey at universities showed that 65% of respondents think that digital skills are essential for any other development, and only 10% consider it irrelevant. Very interesting outcomes are mentioned in the work of Ahn and Ahn (2020). They, as part of their empirical analysis, identified organizational culture, regulatory environment, relative advantage, trialability, and vendor lock-in as absolutely crucial factors of successful adoption of cloud-based ERP as one of the most common tools in digitalization process. In contrast to the study by Barquero et al. (2021), Ahn and Ahn (2020) claim that ICT skills have no significant influence on the digitalization process. The difference may lie in different understanding of definitions of ICT and digital skills.

Whether the studies differ in their view of the matter more or less, there is no doubt that the existing analysis creates many other questions that need to be uncovered. It might also be interesting to find out how the relationship between digitalization and organizational culture is getting change while

digitalization is progressing, changing its dimension, and thus enabling the organizations to become more automated and more efficient than ever before.

4 Results

The Denison Organizational Culture Questionnaire was distributed using a Google form and the data was processed in MAXQDA Analytics Pro 2022 software. Although a total of 654 respondents were addressed, the response rate is 75.5%, which indicates an excellent rate of online survey. For the purpose of the analysis, within this study demographic analysis, descriptive statistics, and regression analysis is used. An internal reliability test is performed to measure the correlation between items.

4.1 Demographic analysis

Based on the results, 67% of the survey respondents were male and 32.4% were female. The age category that was the most represented was the category of respondents with less than 20 years of age. Most of the respondents (84%) were employed in the organization for less than 5 years, 5.5% of the respondents were employed in the organization for less than 10 years. Almost on par with the period of employment in the company were categories 11-15 years, 16-20 years, and more than 21 years (the representation of respondents is approximately 1%). About 12.3% of the respondents work in the IT department, and the same number of respondents work in the sales department. A bit more than 10% of the respondents indicated to exert a function in manufacturing. A total of 8.7% of the respondents work in administration, 7.1% in logistics, 3.8% in line management, and 3.4% in marketing.

Tab. 1 Demographic analysis of the respondents in the online survey

Age category	Frequency	Percent
less than 20 years	272	55.1
21-30 years	192	38.9
31-40 years	5	1
41-50 years	14	2.8
51-60 years	7	1.4
Total	490	100

4.2 Descriptive statistics and Cronbach's Alpha

In Table 2 is outlined the descriptive statistics of survey results of Denison's organizational culture model, especially Mean, Standard Deviation (Std. dev.) and Cronbach α for twelve subdimensions of organizational culture. The value of Mean is examined for four major cultural traits of organizational culture, such as involvement, consistency, adaptability, and mission and for measures of digital assessments. As mentioned within the chapter Methodology, both constructs used the five-point scale to express the attitude to particular statements. The average value mean of four traits of organizational culture is 3.69 and is above the middle value with reasonable dispersions of central tendency. The Digital Assessment result of Mean indicates 3.36, thus indicating a mid-point value. The value of standard deviation is ranging from 1.01 to 1.15 which is also a reasonable dispersion of central tendency. As revealed in Table 2, the highest values of the mean are identified in subdimensions: Empowerment (3.9), Organizational Learning (3.94), Strategic Direction and Intent (3.99), and Agreement (4). It indicates that the employees are involved in organizational matters and are fully informed. The high value of means of Organizational Learning indicates a culture that places emphasis on learning in the workplace and on innovation. The respondents mentioned that they understand organizational strategies and believe in their effectiveness. Sub-dimension Agreement focuses on the critical issues, and results prove that respondents are able to reconcile differences in a constructive way. Digital Assessment has the lowest mean (3.36) comparison with four organizational cultural traits. The highest value of Mean within the mentioned dimension is listed at the sub-dimension of Customer Experience. This infers that respondents point out the Customer

Experience that drives the innovative product design and the production and delivery process. The low values of Mean are indicated at sub-dimensions: Creating change (3.23), Customer focus (3.4), Vision (3.49), People (3.12), Production and Delivery (3.27) and Digital Strategy (3.32). Digital Assessment's measurements show that organizations are not fully digitally mature and this area represents a major challenge for many of them.

A psychometric evaluation includes Cronbach's alpha index, item-total correlation, and correlation between traits and sub-dimensions.

Exploring the reliability of internal consistency, Cronbach's alpha coefficient was conducted. The overall Cronbach's alpha is 0.83. This can be considered as a very high internal consistency (Edwards et al., 1997; Field, 2009; Pallant, 2010). Furthermore, if the Cronbach's Alpha value is higher than .70, it is considered reliable in social sciences. With respect to the various sub-dimensions of organizational culture, the formula was tested for each of the dimensions. The average value of Cronbach's alpha of 18 dimensions is 0.77 compared to the aforementioned value of 0.83. Cronbach's α index of each cultural dimension reduces the alpha value, compared to the calculation of the overall construct. Each dimension has high covariances (α is close to 1). Therefore, the higher the α coefficient, the more the items have shared covariance and measure the same underlying concept. The resulting value of Cronbach's α ranges from 0.81 to 0.83, making the items reliable.

Tab. 2 Descriptive statistics and internal reliability of the initial construct

Item	N	Mean	Std. dev.	Cronbach α
Involvement		3.85		
Empowerment	489	3.9	0.9	0.82
Team Orientation	487	3.87	1.03	0.82
Capability Devel.	487	3.77	1	0.83
Consistency		3.73		
Core Values	487	3.68	1.18	0.82
Agreement	489	4	0.96	0.82
Coordination and Integration	488	3.52	1	0.83
Adaptability		3.52		
Creating change	488	3.23	1.26	0.83
Customer focus	488	3.4	1.09	0.83
Organizational Learning	488	3.94	0.98	0.82
Mission		3.67		
Strategic Direction and Intent	489	3.99	1.08	0.81
Goals and Objectives	488	3.54	1	0.81
Vision	488	3.49	1.06	0.82
Digital Assessment		3.36		
Digital Strategy	486	3.32	1.09	0.81
People	486	3.12	1.15	0.81
Customer Experience	489	3.62	1.09	0.81
Innovative Products	485	3.45	1.1	0.82
Production and Delivery	484	3.27	1.01	0.81
Infrastructure	487	3.4	1.03	0.81

The correlation between cultural traits and sub-dimensions is reported in Figure 1 by arrow-linking. The Denison model focuses on four traits which are related in terms of two underlying dimensions, on the horizontal axis flexibility versus stability orientation, and on the vertical axis external versus internal orientation (Denison and Neale, 1996). Each trait is compatible with the other two traits regardless of two underlying dimensions. For example, Involvement is connected to

Consistency through internal focus and Adaptability is connected to Involvement through flexible focus but the Mission trait is not linked to Involvement. Regardless of this relationship, each trait should strongly correlate with two other traits but less with the incompatible trait (Skarphedinsson and Gudlaugsson, 2013). This statement is confirmed within the research of correlation analysis. Thus, this correlation was statistically examined by comparing each trait. The results are outlined in Figure 1.

The correlations between the four organizational cultural traits including Involvement, Consistency, Adaptability, and Mission are positive and middle high, ranging from 0.57 to 0.69 at the level of p value is less than .05 (Hornungová, 2014). The correlation of related traits is stronger, specifically Adaptability and Mission (0.65) and Adaptability and Involvement (0.69), however, the correlation between Adaptability and unrelated trait Consistency is weaker (0.57). This indicates the convergence and divergent validity of the respective trait. The results show a significant correlation between each other. This proves that the traits were clearly differentiated from each other.

Furthermore, the correlation between particular traits and its subdimensions was examined too to indicate the convergent and divergent validity of traits and its sub-dimensions. The correlation coefficients are significant and positive between each trait and sub-dimensions. The most significant is the relationship between trait Mission and its sub-dimension Strategic Development (0.89) than the correlation coefficients between sub-dimensions of other traits. Moreover, the relationship within the trait Mission and its sub-dimension Goals and Objectives is also significant (0.87) whereas the lowest correlation is between dimension Adaptability and its sub-dimension Customer Focus (0.75). This proves an acceptable convergent and divergent validity. The results revealed in Figure 1, confirm good internal consistency for all cultural traits Involvement, Consistency, Adaptability, and Mission which are strongly related.

Figure 1 Path diagram of correlation coefficients of four dimensions and its sub-dimensions

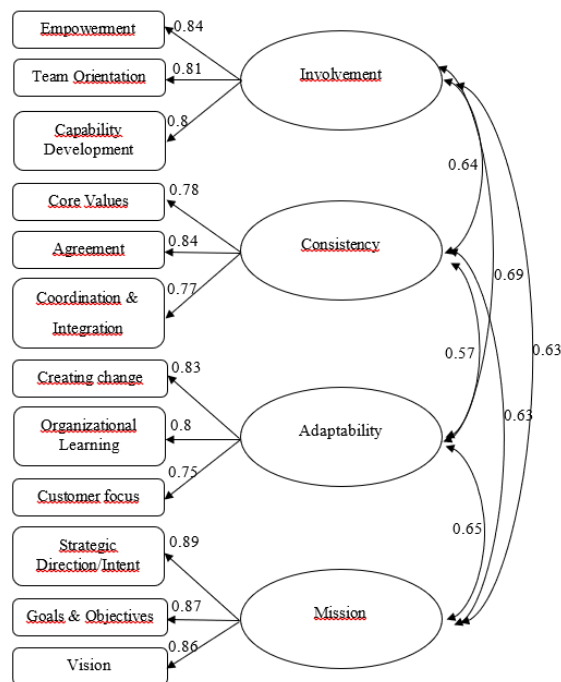


Table 3 presents the correlation coefficients between organizational culture sub-dimensions, and digital measurements are also significant as outlined. Results reveal that sub-dimensions are significantly related to the digital measures. The strong positive relationship is indicated between construct Digital strategy and Organizational Learning (0.453) and also the

relationship between Digital Strategy and Core Values (0.394). Other results correlation between items represent a link between items with lower correlation.

In summary, four cultural traits positively related to digital measurements were examined. Totally 5 of 12 sub-dimensions, specifically Core Values, Agreement, Creating Change, Organizational Learning, Goals and Objectives present a significant relationship with digital measurements. There exists a link between cultural traits and digital measures.

Tab. 3 Correlation between sub-dimensions and Digital measurements

	Dig. Strategy	People	Customer Experience	Innovative Products	Production and Delivery	Infrastructure
Empowerment	0.32	0.26	0.3	0.3	0.25	0.31
Team Orientation	0.31	0.28	0.33	0.33	0.27	0.29
Capability Develop.	0.4	0.35	0.32	0.34	0.3	0.36
Core values	0.39	0.23	0.29	0.3	0.31	0.3
Agreement	0.34	0.26	0.34	0.26	0.34	0.3
Coordination and Integration	0.26	0.16	0.20	0.26	0.212	0.17
Creating change	0.44	0.41	0.42	0.34	0.32	0.39
Customer focus	0.25	0.21	0.28	0.31	0.17	0.23
Org. learning	0.45	0.48	0.41	0.36	0.37	0.45
Strategic Direction and Intent	0.56	0.45	0.47	0.43	0.46	0.5
Goals and Objectives	0.5	0.38	0.37	0.42	0.4	0.43
Vision	0.51	0.4	0.43	0.41	0.39	0.44

To ascertain the extent to which organizational culture influences digital progress, linear regression was used to better account for the quality of the data. Investigating which variable, in this case dimensions of organizational culture, affects to a certain degree dependent variable, in this case digital assessment, we use the least squares method, which is suitable with a relatively large number of variables correlating with each other. Table 4 lists the outcome of regression analysis. The effect of traits of organizational culture on digital measurements is expressed by the beta coefficient. The significant values of the beta coefficient of each dimension and particular digital measurement are highlighted in Table 4. Beta coefficients range from .44 to .81. The results are an acceptable goodness of fit due to the p-value being lower than .05. The highest relation is between all traits and especially digital strategy. These contribute the highest in digital progress. Moreover, the most important relationship between organizational culture traits and the digital measurements is indicated in Adaptability and Digital Strategy (0.73), which indicates that the Adaptability trait positively predicts Digital Strategy. Similarly, Mission and Digital Strategy (0.81), the direct effect is also confirmed. This resulted in β of .81, indicating that there is an 81% chance of detecting an effect if it one genuinely existed. The weakest relation between observed items is between trait Consistency and People (0.44); a unit increase in consistency leads to the corresponding increase of 0.44 in digital measurement People using the standardized coefficient.

Furthermore, the following table provides evidence of the direct effect of Adaptability on Customer Experience (0.73). All dimensions are positively related to various measurements of digital assessment. In general, the results confirm and detect an effect between the traits of organizational culture and the digital assessment's measurements.

The independent variable Mission provides a variance of 36% ($R^2=0.36$) in the dependent variable. Consistency depicts a variance of 17% ($R^2=0.17$), which introduces a better effect on the dependent variable.

Tab. 4 Regression analysis of variables

Independent Variables	Dependent Variables					
	Digital Strategy	People	Customer Experience	Innovative Products	Production and Delivery	Infrastructure
Involvement						
R2	0.18	0.13	0.15	0.16	0.11	0.15
β	0.64	0.57	0.62	0.53	0.50	0.57
p-value	0.00	0.00	0.00	0.00	0.00	0.00
t	10.31	8.58	9.3	9.58	7.81	9.32
Consistency						
R2	0.17	0.07	0.12	0.12	0.13	0.1
β	0.65	0.44	0.57	0.47	0.56	0.49
p-value	0.00	0.00	0.00	0.00	0.00	0.00
t	10.07	6.18	8.16	8.03	8.55	7.47
Adaptability						
R2	0.23	0.22	0.22	0.18	0.13	0.2
β	0.72	0.72	0.73	0.56	0.53	0.66
p-value	0.00	0.00	0.00	0.00	0.00	0.00
t	12.1	11.63	11.54	10.39	8.48	11.13
Mission						
R2	0.36	0.22	0.24	0.23	0.23	0.27
β	0.81	0.66	0.7	0.58	0.65	0.7
p-value	0.00	0.00	0.00	0.00	0.00	0.00
t	16.5	11.68	12.31	12.15	12.03	13.53

5 Discussion

The study focuses on examining the relationship between organizational culture and digital progress in organizations. There are not many existing studies that examine the relationship between organizational culture and digital progress. Within organizational culture twelve sub-dimensions were presented which are divided into four traits. Digital assessment consists of six measurements, which present dependent variables. The internal consistency and reliability of the tested items is acceptable.

To establish the link between observed variables, correlation and regression analysis were used to compare the results.

The lower correlation between four traits indicates a clear and distinguishable link. Traits that are related based on dimensional perspective report higher correlation coefficient and less with the incompatible trait. Particular attention should be paid to the correlations between sub-dimensions and digital measurements. Although each dimension correlates positively with digital measurements, we focus on the most significant relation between observed items. The significant relationship is indicated between Core values and Digital Strategy; if one metric increases, the other increases too, and vice versa. Leaders should put emphasis on reinforcing a set of values that contributes to strengthening the digital strategy. Furthermore, Employees' behaviors are entrenched in the values of the organization. Another evidence is that subdimensions Strategic Direction and Intent and Goals and Objectives are consistent with digital measurements. Leaders should focus on linking the strategy and vision of the organization with digital initiatives.

Entire linear regression model is statistically significant at $p \leq 0.05$. Results point out that the highest relation is between all traits and digital strategy. These contribute the highest in digital progress. Mission defines a meaningful long-term direction of the organization that is in line with digital strategy. Consistency has less impact on dependent variables than the other dimensions within Digital assessment. Nevertheless, Consistency influences highest digital strategy.

Adaptability has a strong effect on Customer Experience. Adaptability reacts to demands from the external environment and turns into action. Due to the significant effect on the Customer Experience, it leads to supporting the process of real-time understanding of customer expectations. In summary, the external focus of the organization (expressed by the highest correlation of Mission and Adaptability) contributes to digital transformation significantly.

Another evident result is that organizations should have a clear digital transformation strategic plan and leadership should be aligned according to digital strategy. An essential characteristic of culture is, in particular, a collective phenomenon shared by members of a society (Davidson et al., 2007).

6 Conclusion

The study contributes to the research of the impact of organizational culture on digital progress within organizations by identifying crucial relationships between traits of organizational culture and digital measurements. The results of the study provide clear evidence of the relationship between traits of organizational culture and digital measurements, specifically between digital strategy and core values and organizational learning. The results emerged from correlating traits of organizational culture and digital measurement paid for attention. Each dimension positively correlates with digital measurements especially within the Adaptability and Mission. These traits highly affect digital evolution within an organization. Organizations with the focus on market change and adaptation will be more likely to digital transformation.

Based on the findings, the trait of Mission influences digital strategy to a high degree. Sum up, if Mission is a strong trait in an organization, there will be more likely to support digital projects. Findings reveal that organizational culture is crucial for successful digital transformation and needs to be given sufficient attention.

Conclusively, this study indicates that organizational culture appears to be a force that boosts digital progress.

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Primary Paper Section: A

Secondary Paper Section: AE

FACTORS OF SECONDARY SOCIALIZATION OF CHILDREN FROM HOME EDUCATION

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The presented paper was processed as an output of the project IGA 004/2020 Secondary socialization of children in home education financed by the DTI University, Dubnica nad Váhom, Slovakia.

Abstract: The essential of this paper is to find out how the secondary socialization of children from home education takes place and to map the personal experiences and opinions of parents educating their children at home. The paper is divided into theoretical and empirical part. The theoretical part deals with the socialization as a necessary process in the life of each individual, we describe the various types of socialization, we deal with a different concept of socialization according to where it takes place, i.e. in the home and school environment. The theoretical part forms the basis for the empirical part. For the implementation of the research, we chose qualitative research using semi-structured interviews, which were conducted with parents who currently have a child or children in home education. The limit of the presented work is a small sample of respondents and the associated impossibility to generalize the results. However, the research went into the depth of the topic and brings subjective opinions and experiences of parents. Another limit is the implementation of interviews through telephone, which do not allow to observe non-verbal expressions of respondents during the interview, which can reveal a lot.

Keywords: home education, socialization, child, family, parents, school, teacher.

1 Introduction

Home education is viewed in two opposing ways. There are many supporters but also opponents of this different way of education. Some are on the side of the school, which according to them represents a natural environment for the appropriate cognitive and social development of the child, others consider this environment as home. The question remains whether it is clear which of them is right. However, the phenomenon of home education is not so widespread in Czech Republic in relation to the number of pupils normally educated in schools, but according to the Statistical Yearbook of Ministry of Education, Czech Republic (2019) it can be stated that the number of children educated in this way is increasing in the hundreds from year to year. Although home education has been legal in other countries for several decades, in the Czech Republic it is not so long ago that it was legally allowed at both levels of primary schools. And that is why this topic can be considered relatively current, given the date of its legalization in our country.

Socialization is considered to be the most debated topic in home education, and insufficient socialization is the most frequently cited reason for opponents of this alternative style of education. Two completely different views on socialization come into conflict. Some claim, for example Štech (2003), that home-educated children live in isolation and grow up in so-called greenhouse conditions. Others, such as Mertin (2003), assume, that the home environment is more suitable for socialization than a school in which there are many negative influences that parents want to protect their descendants from. Several studies on the socialization of children from home education, such as Kunzman & Gaither (2013), Medlin (2013) and Ray (2017a, 2017b) point to the fact that home-educated children are developing just as well socially, if not better than public school children. For example, an analysis of home education performance in the United States confirms that home-educated children are mature, have good leadership skills, interact well with both peers and adults, have no social anxiety, or have problematic behavior. Overall, they manifest themselves in prosocial behavior and social responsibility, as reported by Murphy (2014, p. 37-38). *"School and family are inextricably linked to each other, and how a child thrives at school is not only his personal identity, but also an indicator of family functionality,"* (Štech, 2003, p. 424). And although these two institutions differ in many ways, they have one thing in common: to ensure the child's maximum development.

Research on socialization, socialization skills and social interaction of home-educated children is completely absent in the Czech environment. The only available sources are foreign research. A possible reason for the lack of research may be that home education in primary schools was legalized in the Czech Republic only in 2005 and 2016. For this reason, it is important to pay more attention to this topic.

Because home education does not have such a long tradition in Czech Republic country and is not as widespread as in other countries, as cited in Ročovská et al. (2019), it can be unrecognized and stigmatized by society, for several reasons. For example, due to irresponsible parenting, academic arrogance, excessive social protection, moral extremism, and the exaggerated bond between mother and child, as confirmed by Lois (2012, p. 69-88). According to Kašparová (2019) or Porubčanová et al. (2020) home education is stigmatizing for society mainly for reasons related to socialization, concepts such as *"social isolation, exclusion or child in a greenhouse"* are most often mentioned, and last but not least the irreplaceable role of the peer collective is mentioned as well. The answer to whether this is true or not is provided by the presented paper.

Home education is viewed in two opposing ways. There are many supporters but also opponents of this different way of education. Some are on the side of the school, which according to them represents a natural environment for the appropriate cognitive and social development of the child, others consider this environment as home. The question remains whether it is clear which of them is right. However, the phenomenon of home education is not so widespread in Czech Republic in relation to the number of pupils normally educated in schools, but according to the Statistical Yearbook of Ministry of Education, Czech Republic (2019) it can be stated that the number of children educated in this way is increasing in the hundreds from year to year. Although home education has been legal in other countries for several decades, in the Czech Republic it is not so long ago that it was legally allowed at both levels of primary schools. And that is why this topic can be considered relatively current, given the date of its legalization in our country.

Socialization is considered to be the most debated topic in home education, and insufficient socialization is the most frequently cited reason for opponents of this alternative style of education. Two completely different views on socialization come into conflict. Some claim, for example Štech (2003), that home-educated children live in isolation and grow up in so-called greenhouse conditions. Others, such as Mertin (2003) assume, that the home environment is more suitable for socialization than a school in which there are many negative influences that parents want to protect their descendants from. Several studies on the socialization of children from home education, such as Kunzman & Gaither (2013), Medlin (2013) and Ray (2017a, 2017b) point to the fact that home-educated children are developing just as well socially, if not better than public school children. For example, an analysis of home education performance in the United States confirms that home-educated children are mature, have good leadership skills, interact well with both peers and adults, have no social anxiety, or have problematic behavior. Overall, they manifest themselves in prosocial behavior and social responsibility, as reported by Murphy (2014, p. 37-38). *"School and family are inextricably linked to each other, and how a child thrives at school is not only his personal identity, but also an indicator of family functionality,"* (Štech, 2003, p. 424). And although these two institutions differ in many ways, they have one thing in common: to ensure the child's maximum development.

Research on socialization, socialization skills and social interaction of home-educated children is completely absent in the Czech environment. The only available sources are foreign research. A possible reason for the lack of research may be that home education in primary schools was legalized in the Czech

Republic only in 2005 and 2016. For this reason, it is important to pay more attention to this topic.

Because home education does not have such a long tradition in Czech Republic country and is not as widespread as in other countries, as cited in Rochovská et al. (2019), it can be unrecognized and stigmatized by society, for several reasons. For example, due to irresponsible parenting, academic arrogance, excessive social protection, moral extremism, and the exaggerated bond between mother and child, as confirmed by Lois (2012, p. 69-88). According to Kašparová (2019) or Porubčanová et al. (2020), home education is stigmatizing for society mainly for reasons related to socialization, concepts such as "*social isolation, exclusion or child in a greenhouse*" are most often mentioned, and last but not least the irreplaceable role of the peer collective is mentioned as well. The answer to whether this is true or not is provided by the presented paper.

2 Problem Formulation and Methodology

The aim of this paper is to find out how the secondary socialization of children from home education takes place, and to specify and approach the given methods more from the point of view of educating parents. The results of our research can be a stimulus for professional discussion. At the same time, however, they can be beneficial for students of pedagogical disciplines, but also for teachers, home educators or creators of educational strategies. Overall, the topic of home education in Czech Republic is not empirically mapped, and therefore this research may be a suitable contribution to supplement this missing area.

According to Nakonečný (2005, p. 30), the secondary socialization takes place mainly at school and in a group of peers. We were interested in how children who do not go to school and thus do not spend most of the day in a group of peers are secondary socialized, but at home with their parents or siblings.

Based on the formulated research aim, we set a basic research question: How is the secondary socialization of children from home education?

We divided the basic research question into 5 specific research questions (SRQ), which we present below:

- SRQ1: From the point of view of parents from home education, how is the contact of their children with other children ensured?
- SRQ2: What importance do parents from home education attach to the home education community?
- SRQ3: From the point of view of parents from home education, what role does the family play in the socialization of their children?
- SRQ4: From the point of view of parents from home education, what is the significance of school in the socialization of children?
- SRQ5: How do parents from home education assess their child's social skills?

2.1 Qualitative Research

We chose qualitative research because qualitative research does not depend on theory or established hypotheses. It is an in-depth investigation of the phenomenon and obtaining a large amount of information. During the research, the researcher tries to penetrate into the given situation, because only in this way he can understand the given phenomenon as much as possible and understand the examined person as well as possible (Gavora, 2000, p. 31).

Thanks to the fact that the study of people in qualitative research takes place in their "authentic environment", the researcher can understand the researched phenomenon as it naturally takes place (Švaříček & Šedřová, 2014, p. 17).

In the case of our research, the natural environment was the homes of the families where some of the interviews took place.

Because the qualitative methodology is based on induction, the researcher first collects the data and looks for regularity in the data. Based on the collected data, he sets preliminary conclusions and only then begins to formulate new hypotheses and theories (Disman, 2002, p. 287).

The results of the qualitative research are non-numerical and apply only to the sample examined, and therefore cannot be generalized to the entire population. Unlike quantitative construction, qualitative research is aimed at creating new hypotheses and theories, deep immersion in given cases and discovering hitherto undiscovered connections (Gavora, 2000, p. 31), (Disman, 2002, p. 286).

2.2 Data Collection Technique and Ethical Dimension of Research

We chose an in-depth semi-structured interview as the data collection technique. Using this technique, we found out how children from home education are secondarily socialized from the point of view of their educational parents. Before the actual interviews with the respondents, we prepared a scheme of a semi-structured interview. We started from a basic research question.

Data were collected using a sound recording on a dictaphone in a mobile phone. Only two of the interviews were conducted at the respondents' home, the others were conducted by telephone, due to the situation caused by the COVID-19 pandemic.

Telephone interviews have the advantage over face-to-face interviews in that they provide greater anonymity, which may be more pleasant for some respondents (Disman., 2002, p. 145). However, they also have their limits, which we found in the fact that we did not see the respondents, and therefore could not record their non-verbal signals.

For the analysis and interpretation of the data, literal transcripts of all conducted interviews were used.

During the research, all ethical aspects mentioned in Švaříček, & Šedřová (2014, p. 45-49) were observed. Credibility was ensured by anonymity, when no further information about the families was communicated and pseudonyms for each of the families were used in the data processing itself. Before the actual recording, we acquainted the respondents with the aim of the research, then we asked them for their consent to participate in the research and permission to record our interview. The request for consent to participate and record the interview was then repeated once more on the recording device. At the end of the interview, all respondents were offered the mediation of research results in electronic form.

2.3 Validity and Reliability of Research

Each research technique has two basic properties, namely validity and reliability. Qualitative research is characterized by low reliability and higher validity. Low reliability is due to the fact that the same or similar results cannot be achieved when research is replicated, as qualitative research examines specific phenomena that are constantly changing. Therefore, the results cannot be generalized. Likewise, the results of our research are not valid for all families with home education, but only for those who were part of our research.

On the contrary, the validity is higher in qualitative research. In the interview we used in our research, validity is ensured by the fact that there is the interpersonal contact with the respondent, during which the researcher obtains a unique statement from the examined persons. The more spontaneously, openly and honestly the respondent answers the researcher's questions, the higher the validity of the answers (Gavora, 2000, p. 146), (Disman, 2002, p. 145).

2.4 Selection of Research Sample

Deliberate selection is typically used for qualitative research. In carrying out our research, we focused on families in which home education is currently taking place, at the first or second level of primary school. Specifically, we used cumulative selection in the implementation of intentional selection. This procedure, called "snowball sampling", "consists in the fact that the circle of people with whom the researcher works in his research is gradually expanding" (Gavora, 2000, p. 144).

Data collection took place from September 2021 to December 2021. We gained contacts with families due to the fact that one of the authors of the paper has a child in home education who is a pupil of Elementary School Březová, which significantly supports home education and provides full online support. The school became a mediator for mediating contacts with respondents.

We arranged a personal meeting or the time of a telephone conversation with the families by phone or email. The personal conversation took place with only two mothers, the others were conducted via telephone or Internet applications. The average length of interviews was about 40 to 60 minutes.

2.5 Characteristics of the Research Sample

The research sample consisted of 57 Czech and 3 Slovak families. The respondents were mothers-educators and one father. The main criterion for the selection of samples was that families have at least one child currently in home education, either in the first or second level of primary school. The numbers of children in families were higher, mostly three to four children, in one family.

3 Overview of the Current State of the Issue

3.1 Socialization in the Home Environment

The family is the primary group for a child, in which his or her personality is formed from birth to adult life, and at the same time represents a safe, emotional and supportive environment (Havlík, & Kořa, 2002, p. 67), (Vágnerová, 2012, p. 313). During the socialization process, the child is affected by patterns (parents, older siblings), either positively or negatively. Parents can also be "models for the future" for their descendants, which consists in a child's idea of their own future, which is identical with the life of the parents (Vágnerová, 2012, p. 315). Kraus & Poláčeková (2001, p. 80-81) states, that the family lays the foundation for the child's ability to establish social relationships and prepares him for practical life. It is also responsible for the upbringing of children and plays a key and irreplaceable role in this regard. Maňák et al. (1998, p. 57-59) adds that family education is important in creating a child's relationship with society in the sense that the child is informally influenced by the views of his parents.

The social environment and society can be perceived by individuals as an advantage and a part of life, or, conversely, as a certain limitation. The way of this perception is predetermined already in the microenvironment by the style of education already taking place in early childhood (Řezáč, 1998, p. 46). There is a positive socialization in the family, which is connected with the child's self-esteem and its feeling of being needed and wanted. This then leads to the child being independent and peer group in society. The child should remain in the family environment and should not be included in a larger team until it is able to think independently (Kostecká, 2014, p. 75). It is "even better to wait until the child himself begins to require contact with other children, but it ultimately depends on the social maturity of the child" (Rabušicová, 1991, p. 33).

The undeniable advantage of home education is that the family spends more time together, which leads to a favourable development of the child (Mertin, 2003, p. 415).

Common experiences form family history and participate in mutual coexistence. The relationship between siblings, which brings a certain social experience, is also significant. Siblings compete with each other, learn to work together and influence each other. To some extent, sibling coexistence also depends on whether their parents treat all children in the same way. It can be assumed that in families with more children, socialization within the family can be ensured. However, what may seem problematic are families with only ones (Vágnerová, 2012).

According to Ray (2010), a nationwide study of academic success and demographics of home-educated children, conducted by Ray (2010) on 11,739 children from home education, only one child has 6.6% of families. On average, there are 3.5 children under the age of 21 in families with home education.

The average number of children in families in the United States under the age of 18 in 2010, when the above-mentioned research was conducted, was 1.88 children (Statista.2020).

Although the family is considered as a place for primary socialization, in the case of home education it is necessary that the secondary socialization is also ensured in some way. Therefore, it is important that the family does not live in isolation, but that it is in regular contact with support groups or communities of schoolchildren. These communities tend to be very helpful not only for starting families with home education. There is mutual support, organization of joint events, transfer of experience with pedagogical methods, suitable textbooks and various teaching aids that can make learning at home more effective (Jančáříková, 2016, p. 229). That the support groups are not only for mothers (parents) who exchange their experiences, advice and tips, but also for mothers (parents) with children. A program is prepared for children, during which a team is created, in which socialization then takes place, children cooperate and learn social skills (Šimek et al., 2021). Even in hobby groups, sports clubs or other social facilities, children from home education have the opportunity to come into contact with both a very wide range of peers and an age-heterogeneous team (Kašparová & Láníková, 2016, p. 55), (Bursová et al., 2022).

Another possibility to be in contact with other home-based families are social networks, through which it is possible to connect with families conducting home education from all over the country (Kašparová, 2019). Parents can share their successes and failures, counsel and support each other. They can then find more professional help on portals dealing with home education or directly in schools that offer online counseling with a school psychologist.

3.2 Socialization in the School Environment

The school, as a typical socialization institution, has as one of its tasks and functions to prepare pupils for the next life, in terms of acquiring social skills, responsibility for their behavior, avoiding social pathological phenomena and ability to orient oneself (Kraus & Poláčeková, 2001). The individual has the opportunity to develop its characteristics and skills, which may be important for its future career (Vágnerová, 2012). Although the family is primarily responsible for the upbringing of a child, at a certain age part of the upbringing is left to school or other educational institutions due to the complex development of the child (Maňák et al., 1998). The school socialization contributes to children's independence and responsibility not only to themselves but also to society as a whole, as well as to the autonomy of the individual, as pupils at school must abide by generally applicable rules (Štech, 2007). "Discipline, unlike family, is ensured at school by impersonal rules and disciplinary measures. Ideally, it should be based on the pupil's motivation for knowledge, which the school systematically teaches the child to develop for further (deeper) knowledge" (Štech, 2003, p. 423).

By entering school, an individual acquires new social roles (schoolboy, pupil, classmate) and thus the obligation to meet certain requirements and to respect new norms and values

(Vágnerová, 2012). Contact with peers is seen by proponents of school attendance as one of the positive aspects of school education. School attendance is a specific cultural creation of today's Western society, enabling the acquisition and shaping of ways of thinking, behaving and feeling, without expending much energy and unnecessary losses. Cognitive socialization and the formation of mental structures of an individual are also connected with school. *"At school, children come into contact with peers and with adults other than their parents"* (Štech, 2003, p. 426). Even in early childhood, the relationship with parents determines the patterns of behavior with teachers and peers, problematic family relationships can lead to antisocial behaviour (Mertin, 2003).

The school environment is formed randomly, where pupils from families with different socio-economic status meet. Thanks to this, pupils learn to develop given peer relationships, they learn cooperation, competitiveness and prosocial behaviour (Štech, 2003). From the ninth year of life, peer relationships become more stable and stable. Common interests, individual needs and gaining a place in society play an important role. Contact with peers is essential for proper social development (Maňák et al., 1998). Early peer relationships are a prerequisite for establishing future relationships and friendships.

Thanks to the peer group, the individual ceases to be so much fixed on the family and gains a completely different experience than in the family (Vágnerová, 2012).

The school class as a formal social group is very important for the life of an individual, for example in the completion of personality traits. Same-sex groups are usually formed in the classroom. The position of an individual in this group is determined by learning activities, teachers also evaluate the pupil's personality according to this characteristic (Řezáč, 1998). At a later age, other factors also contribute to the child's position in the class hierarchy, such as social competence, self-confidence or a certain skill that is admired by others (Vágnerová, 2012). It is common for those who play the role of entertainer in the classroom to be valued, while those who are smart and obedient are despised by others (Rabušicová, 1991). Pupils move toward average results for classmates to adapt to the class pressure that is directed at the individual who would like to deviate from the average. Thus, in school there is not only positive peer socialization (cooperative learning, communication, peer assistance (Helus, 1991), (Hanák et al., (2021).

4 Overview of the Current State of the Issue

The first specific question was this: From the point of view of parents from home education, how is the contact of their children with other children ensured? All respondents stated that their children have contact with friends or foreign children at least once a week, in most families almost every day. Contact is secured in several ways. Children visit their friends at home or meet them outside. These are often friends from family, neighborhood or former classmates. Another possibility of contact is interest groups, which, except for one, all children from the responded families visit, many of them several times a week. Last but not least, there are excursions and other events with the current school or the community of schoolchildren. Most families do not use the current school offers very often. The reason is the distance of the school, the unsatisfactory time or the feeling of disruption of the class structure by a foreign element, which is a home-educated pupil. Other families, on the other hand, praise the cooperation with the current school and use the offers of school events.

The school is also associated with the topic of peer needs, which, if necessary, can be met in this way. However, all parents agreed that they do not perceive the deficit of the peer group in any of the children, and on the contrary emphasize the contact with the age-heterogeneous group, which is more natural for individuals, also in terms of adult life. In addition to physical contact, home-educated children can also connect with friends via social

networks, but most children are not allowed by their parents due to their young age, so physical contact predominates in all of them.

The second research question was: What importance do parents from home education attach to the home education community? Many home education-based families associate in communities or home education support groups. Here, too, it is possible to use the power of social networks and make friends, exchange views, experiences and advice with other home education-based families. These communities bring many benefits not only to children, but also to the parents-educators themselves. It is beneficial for children that in such community gatherings they have the opportunity to socialize and make friends with children who are educated in the same way as them. The very experiences of these meetings are also important, it is often a celebration of various holidays, but also walks and games in nature. Communities also visit theaters, museums and galleries. Parents can share with each other their personal knowledge and findings from the area, but also the doubts and disappointments experienced by many home educators. It can also be an advantage that mothers can take care of each other's children, which gives them a free time, which educational mothers are modest, because they play two important roles on a daily basis. Some of the families in the communities are not involved, because, for example, they do not have other families with home education in their vicinity or they prefer sporadic meetings. Communities can also be used for co-learning, bringing together a small group of children of different ages and one mother learning with the children.

The third research question asked: From the point of view of parents from home education, what role does the family play in the socialization of their children? The family has an irreplaceable place in home education. Siblings are important, who spend time together, cooperate and learn from each other. Older siblings are role models for younger and help them. Even parents are a role model and support for their descendants. Thanks to home education, which allows parents with children to spend time intensively, they have the opportunity to really get to know their children, follow them and fulfill their needs and interests. There is enough space for deepening trust, which then leads to improved family relationships in all directions.

The fourth research question asked: From the point of view of parents from home education, what is the significance of school in the socialization of children? Socialization has been and still is influenced by school. Some children from the surveyed families have attended school in the past or still attend it a few days a week. According to the respondents, the school with a non-individual approach and a restrictive daily routine is the most limiting. The absence of support and emotional relationships was also mentioned. School, on the other hand, brings completely new interactions and experiences that home cannot provide.

The fifth and final question was this: How do parents from home education assess their child's social skills? The children of the respondents do not live in isolation and, according to their parents, show prosocial behavior. They are able to make contact and communicate with both children of their age and adults, because they spend their free time mostly in an age-heterogeneous group. Cooperation begins in the family thanks to the higher number of children in families and is reflected in visits to hobby groups or community meetings.

After summarizing the answers to all specific questions, it is possible to answer the main research question: How is the secondary socialization of children from home education? According to the results of the research, home-educated pupils are secondarily socialized in regular and sporadic meetings with the community of home-educated children, either as part of celebrations and other social events or for the purpose of learning together in a small group of children. Another way are friends with whom they see each other several times a week in hobby groups or visit each other. Furthermore, the family and

siblings, who play an important role in the socialization process. Due to age differences, siblings can help each other in many ways, learn from each other and spend free time together.

A comparison of the results, which state the reasons for choosing home education, which are indirectly based on our interviews, with the results of Ray (2017a) shows that we find two groups of reasons for choosing home education - practical and ideological, as divided in (Kašparová, 2019, p. 26-31). The most common practical reasons were certain health, physical or psychological disadvantages, in our research it was dyslexia and antisociality. Among the ideological reasons, dissatisfaction with the school system, the transmission of one's own philosophy of life, religious education or protection against socially pathological phenomena are the most mentioned.

In our research, among ideological reasons, the negative experience with school was most often mentioned.

Murphy's (2014) research confirmed leadership skills, prosocial behavior, social responsibility, and the ability to interact in home-educated pupils. Likewise, the statements of the respondents in our research confirm that home-educated pupils can establish contact, cooperate in a group, communicate with both children and adults and act mature and responsibly. Our results are also in correlation with Kunzman, & Gaither (2013) or Ray (2017b).

Ray (2017b) argues that home-educated pupils are less peer-oriented than school children. This is confirmed by the statements of parents who prefer contact with an age-heterogeneous group for their children, which brings more benefits than an age-homogeneous group. Their interactions have a wider reach and involve both children and adults, making it possible to acquire adequate social skills. Community involvement and various activities with parents also bring many opportunities for socialization. Ray (2017b) mentions "team sports, cooperative learning, church activities and community service."

As part of our findings, we mention activities with the community, the current school, group learning together, hobby groups and the family. Our work is in correlation with the results of Medlin (2013), which emphasizes the importance of providing various resources and opportunities for socialization such as: "family and friends, local home education communities, church organizations, sports programs and the Internet." Likewise, in our research, one of the possibilities was to contact friends via the Internet or activities within the rectory.

Children from home education are "actors of their own socialization" (Medlin, 2013), which is in line with our finding that children have different needs in terms of contact with friends, so they determine how often and intensive their socialization will be. We would add that it also depends on the parental stimuli that they want and can provide to their descendants.

The limit of our research is a small sample of respondents and the associated impossibility to generalize the results. However, the research went into the depth of the topic and brings subjective opinions and experiences of parents. Another limit, as mentioned above, are telephone conversations, which do not allow to observe non-verbal expressions of the respondents during the interview, which can reveal a lot.

5 Conclusion

Socialization in both the home and school environment has its limits, but also its advantages. However, they are united by the same goal, and that is above all the healthy moral and social development of the individual. The advantages of socialization in the home environment can be considered that the home environment is safe, without negative influences that could adversely affect the child. Furthermore, it is time spent together that contributes to the development of family relationships. Last

but not least, the fact that the child is approached individually at home, with respect for his current interests and needs, and so it is possible to develop his individuality. Conversely, disadvantages may be when the family is not involved in any support group or community and lives separately. It can also be limiting when there is only one child in the family who does not have the opportunity to cooperate with the siblings, to interact, to help each other and to develop socially.

The advantages associated with socialization at school are, for example, establishing new relationships, the possibility of comparing with classmates, competition and cooperation. The dark side of school socialization is the various socio-pathological phenomena that occur at school, from bullying to alcohol and drugs. Furthermore, disrespect for individuality.

The role of the teacher as a parent and the teacher as a stranger also has its strengths and weaknesses. As a teacher, a parent knows his child best and wants to provide the best for him. Possible difficulties may arise with insufficient professional knowledge of parents who do not have pedagogical education. Furthermore, it is the approach to the child in education or evaluation of educational results, which may not always be objective due to close relationships. On the other hand, if the teacher is a stranger, his approach is very objective, he can ensure discipline and compliance with the set rules. Above all, however, the teacher is an expert with a pedagogical education.

As has been mentioned several times, the range of research in Czech Republic is very limited, so it is important to pay more attention to this topic from any angle and to raise awareness among the general public about this style of education, which has the potential to be, we do not think for all, but for some children in many ways helpful and beneficial.

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Primary Paper Section: A

Secondary Paper Section: AM

THE IMPACT OF DISTANCE LEARNING ON YOUNG PEOPLE'S SKILLS ACQUISITION

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Abstract: Various factors influence the success of distance education. One of these factors is student satisfaction with distance education, so the authors focused on distance education to analyse the negative impacts on young people's skills. The research was conducted among 202 students, random sampling method was used in the study. Descriptive statistics was used to analyze the research data. As a result of the research, it was found that the school system in Slovakia was not sufficiently prepared for distance learning. The quality of distance education in Slovakia has not reached the same level as the face-to-face form of education. Students see disadvantages in low social contact, communication skills, but see an advantage in the flexibility of education.

Keywords: social contact, communication skills, distance learning, young people, students.

1 Introduction

The functioning of society and its very principles are changing significantly with the evolution of humanity, especially in the field of science and technology. However, the most significant impact on society in recent years has not been caused by the mentioned development of science and technology, but by the COVID-19 pandemic, which has affected all spheres and areas in the everyday lives of people and human society. As a result of the pandemic, both economic and social aspects have changed, and all those involved in these spheres have had to adapt to the new realities brought about by the pandemic in a very short period of time. The use of telecommunications technology, particularly conference calls, has accelerated. The homeoffice in conjunction with video-calling has been used in the workplace, and schools in the educational process have likewise moved to distance learning (Savas, 2021; Green, 2022). Where possible, work activities are becoming increasingly flexible for employees, reducing not only the time in the workplace but also the overall working hours or the working week.

Also within the recruitment processes, job interviews have moved into the online world. Thus, in addition to the negative impacts, the pandemic has also brought with it a speeding up of processes that would normally take significantly longer in terms of timescales. The pandemic has negatively affected economies in all countries around the world and in conjunction with another global crisis which is the war in Ukraine has caused huge price increases, especially in the energy sector but also in groceries (Jagtap, 2022). For this reason, inflation is rising at a very fast rate and some businesses are preparing for a global recession across all economies, which will significantly affect the labour market itself both in the world and in Slovakia. The lives of individuals, households, businesses and the state have been affected. Within individuals, there has been a significant reduction in social interactions and, overall, 'normal' social life has been limited. From the perspective of businesses and especially the state, the whole situation associated with the pandemic is a major challenge (Marchenko, 2021). Businesses face several problems such as employee sick leave and the associated drop in production, dealing with state-mandated measures and the threat of various restrictions that would have the impact of halting production or service provision, i.e. on business activity itself. From the point of view of the state, the importance is placed on protecting the health of its citizens, which means that through various measures and prohibitions, it has tried to restrict social life as much as possible and generally the contact between the people, that we have taken for granted up to now. Within these restrictions, wherever possible, both

private and professional life has gone online. Within the labour market, businesses have moved to homeoffice and recruitment interviews were all done online. These options were also used before the pandemic, but not to such a large extent. The educational process for young people, was also significantly affected and was also conducted online. Practical classes have been cancelled or significantly reduced, as have for example, the school-leaving examinations themselves. Theoretical teaching may not be sufficient together with the acquisition of new knowledge in the form of video interviews. Self-study instead of collective learning becomes important and the actual learning and evaluation by teachers is very difficult. There are a number of problems, the biggest of which are the lack of practical as well as theoretical training, the loss of social habits, the change in behaviour and the overall impact on social skills.

2 Literature Review

Based on the information available from statistical data, the COVID-19 pandemic has significantly affected the employment of young people. We can say that the employment of young people (aged between 15 and 29 years) decreased during the pandemic. When we compare the years 2019 and 2020, where 2019 was the last non-pandemic year and 2020 was the year when COVID-19 started to spread globally, there was a 2.8% decline in youth employment. However, this decrease was not yet due to the impact of restrictions on job preparation, but probably due to restrictions in closures and bans, especially in services (European Commission, 2022). The pandemic had a clear impact on young people (Shields, 2022; Rotar, 2022). A study conducted by the International Labour Organization (ILO) found that the impact of the pandemic on young people was systematic and disproportionate. Based on the findings, up to 23% of young people (aged 18 to 24 years) who were working lost their jobs. Students who are yet to enter the labour market, according to the aforementioned research, have a rather negative and gloomy perception of their working career. Up to 40 percent reportedly perceive their future as uncertain and 14 percent view it with fear. According to interviews linked to the research, changes in the areas of education are particularly emphasised for improving the competitiveness of young people's labour supply. Education should focus more on information technology and be in line with the technological progress and science so it can be more attractive from the employers' point of view. Further, the article states that young people will have a significantly more difficult time entering the labour market after the pandemic and some advantage could be gained from higher education (UN, 2020). A study conducted in Korea in February 2022 in relation to the issue, says that young people may be medically "invulnerable" to COVID-19, but their vulnerability will be the labour market. The results suggest that the restrictions may put young people at higher risk of becoming economically inactive as unemployed, by restricting their social habits, in the form of, for example, regular school attendance, practical training, or restriction of work activities in the context of student work. The study looked at statistical data within Korea, looking at the employment and unemployment rates before and after the pandemic. The analyses were also analysed in terms of the gradual introduction of restrictions, in conjunction with the graphical representation of the aforementioned indicators at the time of the pandemic outbreak. The study concludes that young people were significantly more likely to become economically inactive or less likely to be in demand as jobseekers after the pandemic compared them to other age groups. The problem that the authors conclude by describing as needing to be addressed is that there is a need to rethink and change the social safety net system that focuses on fully employed individuals, as young people do not yet have the same rights as people active in the labour market for longer periods of time. For this reason, state social welfare assistance should be more targeted and adapted to the current situation in order to help young people in the period between leaving school in preparation for a career and becoming employed. (Saejung, Joonmo, 2022; Adnan&Anwar, 2020.)

The pandemic has raised many questions in the world, which needed to be answered very quickly. This was also the case in the educational process, where within a few days all educational activities moved online. In more than 85% of all countries, schools have been closed completely or gradually, which means that schools are no longer accessible to more than 1.6 billion students (10 April 2020). According to a study conducted with secondary school principals in 82 countries participating in the Programme for International Student Assessment (PISA), the rate of students and teachers using these platforms is between 35 and 70% even in schools with effective online learning platforms (The World Global Practice of Banking Education, 2020a, b).

While distance education brings with it some benefits, there are also some limitations (Anderson & Dron, 2017; Crawford etc. 2020). Distance education offers students flexible learning options in terms of time, place and speed of learning, which is valued among students. However, it also brings with it the need for self-direction, technical equipment and independence (Shearer & Park, 2018; Barnard et al., 2009; Firat, 2016).

Many experts have questioned whether higher education is ready for the coming digital era of learning (Houlden & Veletsianos, 2020). Distance education offers teachers and students flexible learning options in terms of time, place and speed of learning through internet technologies. One of the critical indicators of a distance education environment where effective learning processes take place is student satisfaction (Moore, 2005).

Various factors influence the success of distance education. One of these factors is student satisfaction with distance education. In line with this, many studies in the literature report that satisfaction is one of the critical factors determining the success of online courses and is linked to many other factors (Hamdan et al., 2021; Wei & Chou, 2020).

3 Methodology

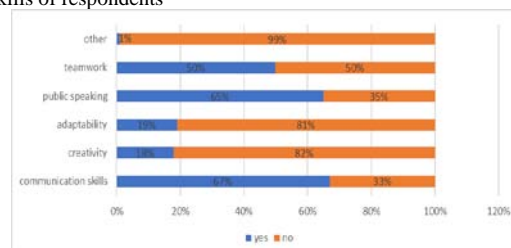
The education of young people raises many questions. We know that many jobs as we know them today will disappear or be redesigned, many new jobs will be created, but we do not know the content of these jobs and therefore education in these contexts is complicated. The aim of the present study was to analyse the negative impacts of online education on the skills of young people. Our research sample consists of students who study in different secondary and higher secondary schools. The questionnaire survey designed by us was filled by students in Slovak secondary and higher secondary schools in the month of May 2022. The responses of the students were first processed using mathematical and statistical methods and the results of the survey were evaluated using a contingency table.

The questionnaire survey was conducted anonymously through an online-questionnaire. We were able to collect 202 questionnaires and based on the responses, we were able to tabulate the data, which allowed us to process a detailed description of the findings. Since we did the questionnaire online, it was made available on a social networking site - Facebook. It was posted in several groups. For the purpose of our study, we are publishing selected questions.

4 Research Results

From the analysis of the respondents' answers, we found that among the negative aspects of distance education can be considered the fact that the teaching is not always concentrated on the student. We investigated which soft skills of the respondents were negatively impacted by distance education. In this case, the variation in the respondents' answers was not investigated. Therefore, Figure 1 represents the subjective opinion of all respondents.

Figure 1 Negative impact of distance learning on selected soft skills of respondents



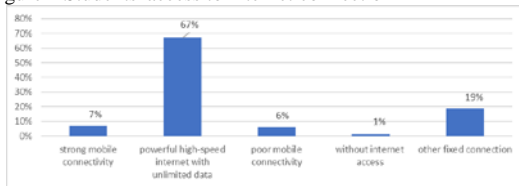
Source: own elaboration

Soft skills are those skills that a student acquires during the learning process and which, unlike hard skills, are more difficult to quantify. Students acquire certain knowledge and skills during their studies for which they are evaluated. These can be classified as hard skills. In contrast, soft skills are those that are acquired, understood and used in a student's career during their studies. Soft skills can include e.g. communication skills, creativity, adaptability, public speaking, teamwork, etc.

Communication skills were the most common option mentioned by students, as 67% of respondents agree that distance learning has had a negative impact on this particular skill. Other skills most frequently identified by students were public speaking (65%) and teamwork (50%). From the above responses, it can be concluded that distance learning has affected interpersonal relationships the most due to the loss of social contacts. Communication skills are the basis for building interpersonal relationships. In fact, students develop their communication skills not only during classes but also when communicating with their classmates (Iksan, 2012). Similarly, public speaking has been limited by distance education. In classroom lessons, students have to overcome both fear and stage fright, e.g. in the case of independent answers in front of the blackboard, etc. Thus, it can be said that in the home environment they were freed from these stressful situations, which could be actually considered as a positive thing. On the other hand, it can be seen as a negative that students in the familiar and safe environment of home do not acquire the necessary skills to be able to overcome themselves and work with stress. But they will certainly need these skills as they move forward, especially in their careers. The third area affected was teamwork, which was also weakened during distance learning. Students were mostly assigned separate projects for homework, which resulted in a weakening of student collaboration. On the other hand, the soft skills on which distance education had the least negative impact from the respondents' perspective were creativity and adaptability. One can agree with the above, as neither the students nor the current school system was prepared for distance education. Both teachers and students had to adapt to this new system quite quickly, acquiring new knowledge in the field of information and communication technologies. The teaching of pupils and students had to go off the beaten track and also the teaching plan and student learning had to switch to a new, practically unknown form of teaching. From the respondents' answers we found that 19% of them found it more difficult to adapt to this system and for 18% of them distance learning had a negative impact on creative thinking.

When distance learning was introduced, it was often discussed that not all pupils and students have sufficient internet connection at home, which is one of the basic conditions for this form of teaching pupils and students. In addition to the lack of technical equipment in schools, as well as in pupils' and students' homes, the Internet connection was the second most discussed issue. Despite the fact that we live in the 21st century and for many people information and communication technologies and the Internet are a normal part of life, there are still those who do not own any technology and do not even have access to the Internet, as we have already pointed out in the theoretical part of the thesis. The following question focuses specifically on the students' technological capabilities. The results of the findings are represented in Figure 2.

Figure 2 Students' access to internet connection



Source: own elaboration

It is clear from the responses that more than half of them, namely 67% (135 respondents), have very good access to the internet with unlimited data and another 7% (14 respondents) have a strong mobile connection. On the other hand, out of 202 respondents, 6% (12 respondents) reported that they have a weak mobile connection and 1% (two respondents) reported that they have no internet access. In one case, it was a student who did not even participate in distance education as he/she continued to study full-time due to poor data connectivity. Finally, 19% (39 respondents) reported having another fixed connection. Distance education had an impact not only on students' learning but also on the teachers themselves, who had to adapt their teaching plans and methods to the new form of teaching.

In the following question, we sought the subjective opinion of all respondents on the teachers' approach to distance learning. Since even in this case it was not the object of the survey to compare the answers of the respondents according to the selected criteria, the overall results are presented in Figure 3, showing that not even half of the respondents were satisfied with the way the teachers handled distance education, as 31% (62 respondents) of them said they handled it fairly well and only 19% (41 respondents) agreed that they handled it excellently. In contrast, 43% (86 respondents) were not satisfied with some of the teachers. A further 6% (12 respondents) agreed that the teachers did not handle distance learning well and one respondent (1%) even indicated a total dissatisfaction.

Figure 3 Teachers' attitudes to distance learning

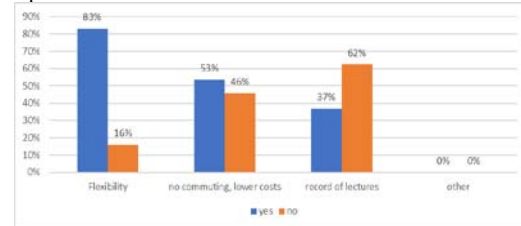


Source: own elaboration

From the above results, it can be concluded that some teachers were able to adapt to the new teaching system effectively and to take advantage of the opportunities that distance learning brings. In contrast, however, not every teacher was adaptable enough and was able to use the advantages of distance teaching to the benefit of the students.

The next two questions in the questionnaire focused on the main theme of the thesis, namely to find out the advantages and disadvantages of distance education from the respondents' perspectives. Respondents were given a choice of three options, which are currently considered to be the significant advantages and disadvantages, or strengths and weaknesses of distance education, and respondents were also given the opportunity to add another option.

Figure 4 Advantages of distance learning from the respondents' perspective

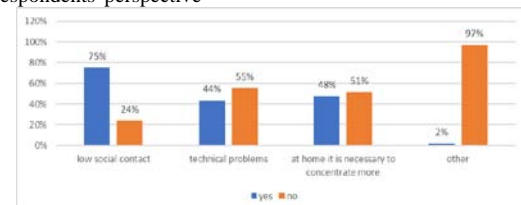


Source: own elaboration

The flexibility that distance learning brings was most appreciated by the students. This option was indicated by 83% of respondents. Flexibility in distance education is associated with the fact that the student chooses the place and sometimes even the time for the learning. This flexibility allows students to better organize their time for learning, allows them to concentrate better, they organize the lesson themselves, and most importantly the online space in a home environment offers a comfortable and quiet environment. Students mentioned as a second option that distance learning is less expensive, saves time and finances, and there is no need to travel to school. This option was identified by 53% of students. Finally, 37% of the students listed the recording of lectures as an advantage of distance education. This recording gives students the opportunity to revisit the lesson, which is a great advantage over the face-to-face form of teaching. Many students often have difficulty remembering the material presented by the teacher in class. The online space makes it possible to remove this "handicap" of traditional teaching. The student can simply replay the lecture recording and gain the necessary knowledge and understanding. This allows him/her to better prepare for the next lecture and achieve better learning results.

The following question focuses on the disadvantages or weaknesses of distance learning from the respondents' perspective. Here again, respondents were given a choice of three options, which we considered to be the weakest aspects of distance education.

Figure 5 Disadvantages of distance learning from the respondents' perspective



Source: own elaboration

From the answers of the respondents we found that students consider low social contact as the biggest disadvantage of distance learning, as 75% of respondents indicated this option. The loss of social contact and other related negative events such as reduced soft skills development, building friendships, etc. can also be ranked as the biggest disadvantage of distance education for students from our perspective. Yet, in the current technological age, it is the building of social contacts that is the most important. The current era allows people to communicate online and therefore often many people are only able to communicate online and, on the contrary, have difficulty communicating in the real non-virtual world. Locking students in a home environment has only encouraged this negative development. In addition to the loss of social contacts, 48% of students identified reduced attention span or having to concentrate more at home than at school as a negative of distance learning. This is mainly due to the fact that students in the home environment have to organize their own time for learning and relaxation and are largely dependent on self-study, which does not suit every student. Finally, 44% of students identified technical problems as a disadvantage of distance

learning. Technical problems are linked both to the low technical skills that some teachers or students possess, but also to the lack of technical and technological equipment in schools or at home. In this case, we would draw attention to the fact that some households do not have the conditions created for distance learning of pupils and students. During their studies, many households had to cope with the fact that they had, for example, only one computer available, while several pupils or students were studying at a distance. Furthermore, distance learning could not fully replace all subjects, especially technical and vocational subjects, which was also pointed out by two students who cited the lack of practice as a disadvantage of distance learning. This is because many households are not sufficiently equipped with technical subjects to adequately teach technical and vocational subjects.

5 Conclusion

In terms of the overall assessment of the survey results, we can conclude that the school system in Slovakia was not sufficiently prepared for distance learning. The quality of distance education in Slovakia has not reached the same level as the face-to-face form of education. In our opinion, this was due to the inexperience of teachers in preparing online lessons and to the low use of innovative forms of teaching methods in the education of pupils and students using information and communication technologies. We consider the lack of student activity during online lessons to be a significant negative of distance education. At the same time, distance education promotes the creation of discussion forums. It is an excellent tool to effectively engage students in discussions and motivate them to learn. However, from the respondents' answers, we found that most of them either did not participate in discussions at all or only to a limited extent. This suggests that distance learning was more theoretical in nature, where students were 'only' presented with the learning material without their direct participation. Distance education offers unlimited possibilities and forms of learning for pupils and students. It is suitable for project-based or problem-based learning for pupils and students. Furthermore, pupils can be involved in discussions through the EUR method, INSERT and many other educational methods that are oriented precisely towards the pupil and his activity. On the other hand, the overall improvement in the students' academic performance can be considered positive, with more than half of the students improving their grades during distance learning, despite the higher demands placed on the students. In our view, the improvement in learning outcomes is a result of students having more flexible study options, having a record of lectures to keep track of the necessary learning and generally organising their own study and relaxation time. From the survey results, we found that the above features, in addition to reduced transportation costs to school and relieving students of the burden of commuting to school, represent the greatest benefits of distance education. On the other hand, however, it should also be pointed out that distance education is not suitable for all pupils and students, as the survey results also showed. Not every pupil is able to concentrate sufficiently as they do at school. Also, many households do not have sufficient technical equipment, which creates technical problems during lessons.

The biggest negative of distance learning is the loss of social contacts and reduced flexibility. Social contacts are important for building partnerships, interpersonal relationships and for the future employment of pupils and students in private and working life. Employers are currently most demanding soft skills from new recruits. Distance learning, which has been one of the longest in the world, has thus significantly influenced two generations of the future workforce, namely Generation Z and Generation Alpha. Exploring the implications and suggesting recommendations for adoption will be the subject of further academic work.

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Primary Paper Section: A

Secondary Paper Section: AE, AO

ASSESSING INTEGRITY AT WORK: DEVELOPMENT AND PSYCHOMETRIC EVALUATION OF THE OCCUPATIONAL INTEGRITY SCALE

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Abstract: Interest in the diagnostics of integrity by work and organizational psychology researchers and practitioners alike has been steadily increasing. In two studies we report results on the development of the Occupational Integrity Scale (OIS), a novel, openly available scale. The first study tested the psychometric properties of the OIS in a sample of 870 adult public education employees. The second study replicated the factor structure of the OIS in a sample of 147 company employees and tested the validity against self-reported Big Five and supervisor-reported employee CWB two months later. A three-factor solution was identified. The OIS demonstrated consistent relationships with personality criteria and limited associations to supervisor assessment of CWB.

Keywords: counterproductive work behaviour, personality, integrity at work, honesty, public organizations, private organizations.

1 Introduction

Integrity at work has become one of the most distinctive evidence-based research areas for understanding the relationships between personality and work outcomes (Cortina & Luchman, 2013). Integrity at work, i.e., the occurrence of honesty, trustworthiness, truthfulness, fairness, and commitment to morality (Schlenker, 2008), is considered the third most important personality predictor of overall job performance after conscientiousness and general mental ability (Schmidt et al., 2016). Moreover, integrity at work is one of the most robust predictors of counterproductive work behavior (CWB; Ones et al., 1993). Specifically, lack of morale, honesty, conscientiousness, and other positive traits associated with integrity at work are more likely to result in harmful behavior toward others or the organization itself (Cohen et al., 2014, van Iddekinge, 2012). An experience of harmful behavior was experienced by 98% of employees, and even half of them were targets of bad behavior once a week (Porath & Pearson, 2013). Therefore, integrity experienced and manifested by organizational members as a means to address CWB is the legitimate interest of practice and research, as evidenced by a number of sources over the past 30 years (see, e.g., Cohen et al., 2014; Ones et al., 1993; Sackett et al., 1989; Schilpzand et al., 2016; van Zyl & de Bruin, 2017 or Wanek et al., 2003).

Research on the propensity to engage in moral behavior and, in particular, moral behavior in the workplace has a long history with three distinct and somewhat different traditions: philosophical, cognitive-developmental, and empirical (Ash, 1991; Sackett et al., 1989; Schlenker, 2008). The philosophical tradition from which the concept of integrity originated has had a long standing since the time of ancient Greece to the work of contemporary scholars such as McFall (1987), Schlenker (2008), and Dunn (2009). The cognitive-developmental psychological approach to moral reasoning and moral conduct includes contributions from eminent scholars such as Piaget (1948) and Kohlberg (1973). Finally, the more recent empirical tradition grew out of an interest in identifying individuals who may pose a threat to public policy, group welfare, and private interests because of dishonesty and antisocial behavior (Ash, 1991). Although these directions share an interest in moral behavior in a social context, their positions have remained separate, as reflected in their different diagnostic approaches.

Typically, integrity at work is assessed using personality-based and overt integrity tests (Ones & Viswesvaran, 2001), which have emerged particularly from the empirical tradition. Personality-based tests (e.g., the Personnel Reaction Blank, Gough, 1971) measure personality traits that correlate with a wide range of counterproductive behaviors (Sackett et al., 1989). Conversely, overt integrity tests aim to capture applicants' or employees' attitudes toward various forms of dishonest behavior by directly targeting items related to experiences or attitudes about theft, absenteeism, and the like; examples of such measures include the London House Personnel Selection Inventory (Boye & Wasserman, 1996). A somewhat different perspective, encompassing broader theoretical sources, is offered by tests drawn from the philosophical tradition (e.g., Moral Character Questionnaire, Furr et al., 2022 or Integrity Scale, Schlenker, 2008). These tests have also attracted research attention (Ampuni et al., 2019; Krettenauer et al., 2021; Okan & Eksi, 2020) and demonstrated their utility in predicting CWB.

Although an association between integrity and CWB has been demonstrated (van Iddekinge et al., 2012; Ones & Viswesvaran, 2001; Stehlík, 2015), the explained variance occasionally appears to be small (Coyne & Bartram, 2002; Van Hein et al., 2007). Therefore, access to appropriate integrity diagnostics remains a key issue.

The choice of appropriate diagnostics approach is exacerbated by the relative lack of non-commercially validated methods for integrity diagnostics, which limits opportunities for further research. This is particularly true for the Central European region, where there is a lack of integrity testing and little information on testing from public or private organizations. Therefore, the aim of this article is to a) present the development and testing of the Occupational Integrity Scale, a novel, open-access integrity test, b) determine the construct and criterion predictive validity of the new scale using prospectively determined CWB and personality criteria. In doing so, we discuss integrity tests for different types of counterproductive work behaviour in public and private organizations and provide a link to related research and practice.

1.1 Defining of Counterproductive Work Behavior and Integrity

Counterproductive work behavior (CWB) is characterized by some degree of dishonesty and deliberateness. It is behavior that can harm the organization and/or its members (Camara & Schneider, 1994), including the circle of customers, suppliers, and others associated with the organization. Given the nature of CWB, there is no doubt that it is in the interest of everyone associated with the organization to prevent CWB. However, although a general CWB factor is described (Berry et al., 2012), it is more of a hierarchical structure in which a common factor encompasses substantially different behavioral dimensions (Schmitt & Highhouse, 2013). The behavioral dimensions of CWB differ in their severity (e.g., theft vs. misuse of information) and in terms of the target harmed by the behavior (e.g., verbal aggression harms the individual vs. poor work quality harms the organization). In predicting dishonesty, not only should a common CWB factor be considered, but also separate factors representing different counterproductive behaviors in the workplace.

Robinson and Bennett (1995) were among the first to propose, using multidimensional scaling techniques, a commonly cited subdivision of CWB: the severity and goal of harm to organizations or individuals. Later, Gruys (1999) introduced another taxonomy consisting of 11 different CWB types. Sackett (2002) combined and tested (Gruys & Sackett, 2003) the results of the precursors into a new taxonomy that is probably one of the most influential at present (Schmitt & Highhouse, 2013). This latter taxonomy was applied in the present study.

Although CWB is relatively well defined, integrity is a complex concept and lacks a consistent definition (Wanek et al., 2003). As argued here, this inconsistency is partly the result of different traditions. From a philosophical perspective, integrity is a complex organization of personality (Dunn, 2009), whereas from the empirical perspective of overt and personality-based tests, the characteristics that most closely resemble the label of integrity are those of honesty (Ash, 1991; Frost & Rafilson, 1989). However, the next distinction between overt and personality-based integrity tests may also arise from their validity against behavioral criteria. Marcus et al. (2016) established the predictive validity of integrity tests using indicators of behavioral integrity beyond standard personality measures, with the definition of behavioral integrity being "proactive adherence to general rules of ethical and interpersonally fair behavior" (p. 64). Behavioral integrity, as the criterion for tests evolved from empirical tradition, is then close to the philosophical perspective. In summary, despite the differences noted between the various research traditions and operationalizations of integrity, there is also considerable overlap that informed the delineation of integrity in this study.

In the present study, integrity was considered as a commitment to moral principles that leads individual behavior to be aligned with a set of moral values derived from cultural and social norms that become evident over time and in different social contexts (Dunn, 2009; Schlenker, 2008). These include trustworthiness, honesty, and respect for promises and one's principles, as well as the fulfillment of tasks and roles for which individuals have accepted responsibility. A key component of this approach is the moral component of integrity advocated by Dunn (2009).

1.2 Empirical evidences for types of integrity tests

Tests with a clear objective and with direct questions about attitudes toward and experience with honest behaviour, labelled as overt integrity tests, were developed after World War II (Ash, 1991). The original primary purpose of developing an integrity test was to help predict workplace theft, so items were often worded along these lines (Sackett et al., 1989). Accordingly, Frost and Rafilson (1989) found that theft had a stronger relationship with overt integrity scores than did the general CWB factor. However, the predictive power of overt integrity tests is not limited to theft, and it would be a mistake to focus only on the predictive power of this one CWB factor (Frost & Rafilson, 1989; Ones & Viswesvaran, 2001). The current goal of open-ended tests, based on criterion validity summarized in the meta-analyses, is to capture attitudes toward various forms of dishonest behavior through proper item design (Ones et al., 1993; Ones & Viswesvaran, 2001).

Very similar to the format of the open integrity tests, but coming from a different tradition of integrity research, are relatively new tests (Furr et al., 2022; Schlenker, 2008) based on the philosophical tradition. Schlenker (2008, p. 1086) found that high scores on the Integrity scale also reflect a stronger assertion of being committed to ethical principles. The items target more general moral principles from which respondents can choose what is right or wrong for them. However, a portion of the Integrity Scale items also focus on attitudes toward behaviors of the disruptive kind, such as lying or cheating, as these issues are inherent to integrity (Schlenker, 2008). In this sense, the Integrity Scale is close to the approach of open-ended integrity tests (empirical tradition with items directly targeting dishonesty) and also to the concept of morality in character and moral maturity (Cohen et al., 2014). The approach advocated by the Integrity Scale seems to offer a broader picture than the overt tests in the empirical tradition, as it also focuses on the philosophical foundations of integrity and on applied attitudes.

The origins of personality-based integrity testing can be traced to the early 20th century in the form of covert purpose tests that could detect dishonesty (Ash, 1991). After World War II, dishonesty tests evolved into measures of personality traits that were largely related to dishonest work behavior. However, there are mixed results supporting the applicability of personality-

based integrity tests. While Cullen and Sackett (2003) suggest that personality-based integrity tests can be expected to predict specific subordinate factors of counterproductive work behavior such as turnover or absenteeism, a meta-analysis by Ones et al. (1993) provides evidence supporting the criterion validity of personality-based integrity diagnostics for the general CWB factor. Another meta-analysis (van Iddekinge et al., 2012) presented validity coefficients corrected for non-reliability $\rho = .27$ for all types of designs with personality-based integrity tests and concluded that differences in validity results for personality-based tests depend on several moderating factors, including the type of participants, the source of the criterion, and the type of research design. Therefore, in the two studies reported here, we chose to control for the aforementioned variables and set the same conditions for both tests used.

The most commonly used personality traits in the context of CWB, which provide the theoretical background for the development of personality-based integrity tests, include: conformity, sociability, impulse control, reliability, and credibility (Ones et al., 1993; Wanek et al., 2003). Yet, despite the identification of several such integrity indicators, the five-factor model (FFM) dominates the operationalization of personality-based integrity traits (Salgado & de Fruyt, 2005; Schmidt et al., 2016). A comprehensive review of studies linking CWB to FFM dimensions (Hoffman & Dilchert, 2012) suggests that CWB is mainly associated with Conscientiousness (validity coefficients corrected for non-reliability [ρ] ranging from .26 to .35), Agreeableness (ρ ranging from .28 to .40), and Emotional Stability (ρ ranging from .20 to .35).

2 Present study

Several overt and personality-based integrity tests are available, both for commercial and research use (van Iddekinge et al., 2012; Ones & Viswesvaran, 2001). Widely known overt integrity tests include the London House Personnel Selection Inventory (Boye & Wasserman, 1996), the Reid Report (Weiss, 2010), and to some extent the Integrity Scale (Schlenker, 2008), as discussed above. Personality-based tests typically include tests such as the Personal Outlook Inventory (see Sackett et al., 1989) or the Employment Inventory (Paajanen, 1986, cited in Frost & Rafilson, 1989).

Most studies testing the validity of integrity tests to predict CWB have used commercial instruments (van Iddekinge et al., 2012), and fewer studies have used noncommercial integrity tests, especially open ones, making independent research more difficult. Non-commercial open-ended integrity tests include the Employee Attitude Index (EAI, Ahart & Sackett, 2004) or the Workplace Productivity Questionnaire (WPQ, Nicol & Paunonen, 2002). However, the latter list is short and provides insight into the scarcity of current open integrity tests. The availability of open integrity tests in different national languages is also limited. In particular, contemporary open and personality-based integrity tests for non-commercial use are still not available in the Czech and Slovak Republics (Seitl, 2015), while commercial instruments are generally used instead. It is noteworthy that much of this work has been conducted in private organizations.

Thus, the aim of the present study was to develop a new self-report scale for assessing integrity at work, the Occupational Integrity Scale, and to investigate its basic psychometric properties (factor structure, consistency, and validity) in samples of employees from public and private organizations. In addition, we aimed to assess the criterion predictive validity of the new scale against supervisor-rated CWB and construct validity against personality traits. The Occupational Integrity Scale was compiled in accordance with the above outlined constructs. It is an originally developed inventory with 35 items. In defining the items, descriptions and examples of items from the philosophical approach (e.g., Dunn, 2009; Schlenker, 2008) were used as a theoretical source. Subsequently, the designed items were discussed with three experts—a director of HR and two academic scale construction specialists. The first set of items was adapted

and new attitude items were added to the scale in terms of open-ended integrity tests. The Integrity Scale also inspired us to take this step, however, given the need to use more job-specific than general attitudinal items, we focused more on applied attitudes toward dishonesty in the workplace. The final goal was to obtain two specific and one general latent factor for workplace integrity. The first specific factor, moral integrity, which refers to general moral issues and commitment to them, consisted of 21 items. The items focus on the respondent's principles and moral values, adherence to their word, credibility, reliability, reluctance to violate their own established principles, and belief in general rules. The remaining 14 items, representing the second factor, were selected to reflect the demonstration of honest behaviors at work (Schneiderová, 2017).

2.1 Study 1

The aim of the first study was to observe the basic psychometric characteristics, select from the proposed items the subset that maximizes factor reliability, and test the functionality of the new scale with a large sample of public sector employees in the Czech Republic.

Method

Sample and procedure. To test the psychometric properties of the OIS, teaching staff from elementary schools in the seven Czech regions were used as test participants. Educators were chosen mainly because of relatively good accessibility and high degree of homogeneity. A total of 922 participants completed the test administration. Following information about the aims, right to withdraw at any point, and anonymity, the first page of the survey stated that completion of the questionnaire constituted proof of participants' informed consent to take part in the study. When completing the study, participants also had the right to withdraw, in which case, their data were immediately deleted. A total of 43 respondents selected to be deleted from the database, and a further nine sets of answers were discarded as meaningless. The final sample thus comprised 870 respondents, of whom 105 (12%) were men. The age span ranges from 19 to 73 years (median 44 years). More than half (52%) of the respondents reported working for more than 16 years.

Measure. The scale comprised 35 items scored on a five-point scale ("I totally agree" -5- to "I totally disagree" 1); Therefore, lower scores on the Occupational Integrity Scale indicate lower integrity. The time needed for the administration of the scale is approximately 10 minutes. Table S1 provides an overview of the scale items in English and Czech (see the list of the tables in the repository before the list of references).

Results

For many of the item scores a high degree of skewness towards negative values was observed. Therefore, we worked with item scores in most cases of following analyses as ordinal quantities.

Exploratory factor analysis. We initially investigated the factor structure of the OIS using exploratory factor analysis (EFA) performed on a matrix of polychoric correlation coefficients using the statistical program R (R team, 2014) via the psych and nFactors libraries. Maximum likelihood estimation was chosen as the extraction method and results were oblimin rotated. Examination of the scree plot indicated the existence of one common and several smaller factors. Applying the acceleration factor method suggested the existence of a single factor for analysis. More advanced methods (parallel analysis, optimal coordinates) pointed to an eight-factor solution. Interpretability of factors was used as a criterion in selecting the number of factors to extract.

Based on the above methods, a clear result was provided by a three-factor solution that explained 32% of the variability (the first factor accounting for about 15% of the total variance and the other two factors for 8%). The first factor was labelled 'reliability' as it saturated, for example, items 27 (.70 factor charge, abbreviated: People think I'm reliable.) and 23 (.66, I

always return what I borrow. The second factor, was labelled 'adherence to principles' since it attracted the highest loadings from items 9 (.61, It is important to stand by your principles regardless of losses.) and 16 (.59, To stand by your principles even if it is disadvantageous.). The third factor was named 'moral sense' as it saturated especially the reverse-scored items 32 (-.66, It's okay to use another person to achieve your goals.) and 11 (-.60, Lying is required to reach your goals.). The mutual factor correlations ranged from .29 to .33.

A model comprising two correlated factors, explaining 28% of the variance was also relatively well-interpretable. The second and third factors (moral sense and adherence to moral principles) were merged into one factor. Although this solution is closer to the original theoretical point of view, in consequent analyses the internal split factor of the second factor was evident resulting in preference of a three-factor solution. Table S2 contains the three-factor solution (see the list of the tables in the repository before the list of references).

Confirmatory factor analysis. The fitness of a three-factor solution proposed in the EFA was verified by a confirmatory factor analysis (CFA). Calculations were performed with the lavaan and semTools libraries (Jorgensen et al., 2018; Rosseel, 2012) with WLSMV as the chosen estimation method.

To describe the factor structure of the OIS we chose the bifactorial model. This model assumes the existence of a general factor which feeds all the test items, as well as of several (in this case three) specific factors which are saturated with selected items. Thus, two factors affect the score for one item – one general and one specific. All factors are modelled as orthogonal.

The result of a model that included all 35 items (to be attributed to the highest factor saturation obtained by EFA) had an acceptable data match, $\chi^2(493) = 1075.92$, CFI = .935, RMSEA = 0.037 (.034; .040). However, after reviewing the amount of error variance for each item, we found that a number of items did not perform any function, since their communalities reached just one or a few per cent, generating what was, basically, error variance. As a result, we removed individual items according to their communality until we determined a solution that demonstrated good fit with the data and, at the same time, contained enough items to avoid compromising the test's reliability. The final solution used 23 items (12 fall under the first factor, six under the second, and the remaining five under the third) and demonstrated an excellent match with the data, $\chi^2(207) = 387.96$, CFI = .971, RMSEA = .032 (.027; .037). The factor loadings are shown in Table 1. For more information, see Table S3 (see the list of the tables in the repository before the list of references).

Reliability. To estimate the reliability of total test and individual factors, we used the omega coefficients based on the factor weights of the bifactorial model. The reliability of the twenty-three-item OIS version was equal to .84. The reliability factor has a reliability of .78, the adherence to principles factor one of .72, and the moral sense factor one of .65.

2.2 Study 2

The aim of the second study was to replicate results from the first study regarding the factorial structure of the scale, and to test the criterion predictive validity of the OIS via supervisor-reported CWB and construct validity via self-reported personality traits.

Method

Sample and procedure. The sample comprised a total of 147 male respondents, all employees of a manufacturing company in the Czech Republic. All respondents were from one shift and represented 100% of this shift. Their voluntary involvement resulted from the study's ethical clearance. The respondents' ages ranged from 22 to 61 years (M = 42.8, SD = 9.1, median = 43). The average seniority was M = 16.4 years, SD = 9.7, median = 16 years.

Respondents were recruited with the use of the intentional selection method, since voluntary choice in testing for integrity can lead to the greater involvement of people with higher integrity and therefore reduce the validity of results. Each respondent filled in an informed consent form, followed by the NEO-PI-R questionnaires, the Occupational Integrity Scale and standard demographic data (age and the length of their employment in the company). Codes on each respondent's questionnaire were placed by the line managers and passed to the research team so that only the line manager knew the link between the employee's name and the code. The line managers knew the respondents' identity, which the research team did not know, and, on the other hand, the line managers did not have the results of the questionnaires after their evaluation.

In the second phase, that took place two months after the respondents were tested, their superiors were invited to assess the incidence of counterproductive behaviour among the research participants during these past two months. Before the evaluation was completed, another meeting was organized with

the managers to explain the research goal again. It included training to reduce subjectivity and inter-individual differences in evaluation. The evaluation was performed again in pencil-and-paper form. The line manager put the code assigned in the first phase of the research to the evaluation form, which the research team subsequently linked to the codes in the questionnaire without knowing the identity of the respondents.

Measures. Three measures were used in the present study: a) the Occupational Integrity Scale, b) the NEO-PI-R, c) a CWB assessment by line management that took place in the second phase of the study. The NEO-PI-R (Costa & McCrae, 2008; Hřebíčková, 2004) was used because of its verified relation to CWB (Hoffman & Dilchert, 2012; Ones et al., 1993). Specifically, in line with Hoffman & Dilchert's (2012) meta-analysis, we utilized three FFM dimensions from the NEO-PI-R (conscientiousness, agreeableness, neuroticism). The NEO-PI-R is made up of 240 items, on which the respondent describes on a five-point scale to what extent it corresponds with them.

Tab. 1: Results of linear regression models: Dependence of CWB on OIS and NEO-PI-R test scales

CWB	OIS			NEO-PI-R		
	R^2	ΔR^2	Significance	R^2	ΔR^2	Significance
Misuse of time and resources	71.0%	0.7%	$F = 0.77; p = .51$	72.9%	2.6%	$F = 3.30; p = .02$
Unsafe behaviour	76.5%	0.9%	$F = 1.38; p = .25$	77.2%	1.7%	$F = 2.58; p = .06$
Poor attendance	32.7%	0.9%	$F = 0.47; p = .70$	36.9%	5.2%	$F = 2.83; p = .04$
Poor quality of work	34.6%	1.3%	$F = 0.68; p = .57$	35.5%	2.2%	$F = 1.17; p = .32$
Inappropriate verbal actions	44.2%	0.8%	$F = 0.50; p = .68$	47.1%	3.7%	$F = 2.37; p = .07$
Passive aggressiveness	51.1%	4.0%	$F = 2.82; p = .04$	51.4%	4.3%	$F = 3.06; p = .03$
Total CWB	42.1%	1.6%	$F = 0.95; p = .42$	46.5%	6.0%	$F = 3.85; p = .01$

Note. R^2 corresponds to a complete model. ΔR^2 is a difference in the accuracy of the full model and model that contains the only regressor that is the evaluator (eight levels), and thus indicates the degree of refinement that occurred as a result of the inclusion of test results (OIS or NEO-PI-R). The statistical test verifies whether this increase in accuracy is statistically significant. Statistics F has, in all cases, 3 and 103 degrees of freedom.

The evaluation of employees' CWB by their line management contained 30 statements, each describing one particular manifestation of CWB. To create the statements, we applied the list of counterproductive work behaviour (Sackett, 2002). These were: theft, destruction of property, misuse of information, misuse of time and resources, unsafe behaviour, poor attendance, poor quality (poor quality of work), alcohol use, drugs use, inappropriate verbal action, and inappropriate physical action. Managers assessed each statement, depending on how often the behaviour of the particular employee occurred in the time interval that was observed, on a 0 - 4 scale (with a verbal anchoring, never, rarely, occasionally, often, very often).

Results

Firstly, we tested whether the psychometric properties of the OIS observed in the group of teachers in study 1 could also be observed in a more diverse sample. We therefore aimed to verify factor invariance between the first and the second respondent group.

The model proposed in the first study was repeatedly fitted to both groups, and restrictions on the match of parameter values between the two groups were gradually added. The model configuration invariance, which assumes the same structure but does not place any conditions on the coefficients of factor weights, showed a very good match with the data, $\chi^2(415) = 714.49$, CFI = .970, RMSEA = .038 (.033; .042). As a result of attaching the restriction to the factor saturation concordance, a small but statistically significant decrease in accuracy occurred. Adding other restrictions did not result into a deterioration in the model quality. The residual invariance model still demonstrated a high fit, $\chi^2(487) = 1025.382$, CFI = .963, RMSEA = .047 (.043; 0.051). The results, therefore, suggest that the OIS retains the same factor structure for respondents from a diverse work environment.

Investigating the presence of CWB and monitoring the factors that may indicate its presence brings a number of likely pitfalls.

The first is the great diversity of its manifestations and its relative scarcity within some of the areas being monitored. If one follows the division of CWB into the 12 areas proposed by Gruys (1999) and Sackett (2002), she will observe almost exclusively zero values for several of the areas. The second issue concerns possible differences in the style and quality of the evaluation of the employees by the line managers. After records obtained were reviewed, it became clear that the data from one of the evaluators was strikingly different from that from the rest 7 - the number of registered CWB occurrences in this case was within the 26-40 range (median 28), while in the other evaluators it was within the 0-25 range (median 4). Most of the records of this assessor were almost or totally identical, so we did not consider them valid and they were discarded for further analyses. This led to a reduction in the sample size to 113 respondents (22 to 61 years, mean age of respondents 43.1 years, median 44 years, standard deviation 9.8 years).

Table S4 depicts the means, standard deviations, and intercorrelations between variables (see the list of the tables in the repository before the list of references). The first part of the table summarizes also descriptive statistics for study 1. Attention should be paid especially to intercorrelations among OIS subscales as well as to relations between OIS and personality test in the meaning of N, A, C factors of NEO-PI-R. On the level of OIS, the relation of Moral sense factor seems to be interesting, because this factor, unlike the others, has just weak or no relation to the rest of OIS factors. With the exception of relations between OIS and Neuroticism, the results represent expected relations of OIS to Agreeableness and Conscientiousness. The results support the construct validity of the OIS. We should point out however, that the presentation of relations of CWB's to OIS and personality measures is done as a general summary of the data and does not account for organization level differences, something that is controlled for in the regression analyses.

Tab. 2: Beta weights of individual OIS and NEO-PI-R dimensions in predicting of CWB

CWB	OIS			NEO-PI-R		
	Reliability	Adherence to principles	Moral sense	N	A	C
Misuse of time and resources	-.05	-.02	-.07	.04	-.16 **	-.02
Unsafe behaviour	.02	.00	-.09	.12*	-.11*	-.04
Poor attendance	.05	-.03	-.05	.08	-.22 **	.02
Poor quality of work	-.09	.01	-.02	.12	-.13	-.07
Inappropriate verb.	.01	.05	-.07	.08	-.16*	.06
Passive aggressiveness	.06	-.01	-.18*	.02	-.10	.15 *
Total CWB	.03	-.01	-.11	.11	-.23 **	.02
Neuroticism (N)	-.20*	-.04	-.18			
Agreeableness (A)	.31**	.19*	.27**			
Conscientiousness (C)	.43***	.29**	.12			

Note. *,** and *** indicate statistical significance at levels of significance of .05, .01, and .001.

Because of the characteristic arrangement of CWB scores with their peak around zero, dependent variables in the regression models were logged transformed. For each of the CWB dimensions where we observed a sufficient non-zero value occurrence, we created two statistical models: one predicting the number of transferred CWB points on the basis of three subscales of the twenty-three-item version of the OIS and the other predicting the same using the three NEO-PI-R factors. Apart from the stated regressors, a nominal regressor, "evaluator", was also included in both models to control for the non-independence of measurement in the assessment of CWB. In both models we observed their predictive validity and especially how their predictive validity depends on the scales of the diagnostic method beyond the information of who rated the employee. Details of how much information on the CWB the individual tests bring and whether the results are statistically significant are summarized in Table 1. Subsequently, we examined the effect of the various factors of the OIS, or the FFM dimensions, on various manifestations of CWB. Lastly, in a test of construct validity, relationship between the OIS factors and the FFM dimensions was examined. These results are shown in Table 2.

The obtained results provided limited evidence of the possibility of predicting CWBs on the basis of the OIS factors. A significant association with the OIS factors was only detected in the case of passive aggressiveness, where a negative relation with the scale of moral sense was also observed. The contribution above the framework of variance, which can be explained by the regressor of the evaluator, was, however, only 4%. A higher CWB prediction was observed by means of the three FFM dimensions. This includes, especially, the dimension of Agreeableness, which, with its negative weight, links both with the total CWB score and with specific demonstrations, such as Misuse of time and resources, Poor Attendance, and Inappropriate verbal actions. The explained variance does not exceed 6%. With the exception of Agreeableness, a significant relation was also observed in Conscientiousness, which has a positive weight in Passive aggressiveness.

Finally, the analysis brought findings of the construct validity of OIS. The Reliability factor had a negative effect on Neuroticism, all three OIS factors had a positive effect on Agreeableness, which is true also for Conscientiousness, with exception of Moral sense effect. Preliminary conclusions to the construct validity were confirmed and supplemented in detail.

3 Discussion

The aim of the studies presented here was to test the basic psychometric properties of the Occupational Integrity Scale (OIS), a new, freely available integrity scale. In addition, we aimed to determine the predictive validity of the OIS with respect to supervisors' prospective assessment of various types of counterproductive work behaviors (CWB) and construct validity with respect to employees' personality traits.

The OIS was constructed as an instrument to assess the level of integrity in employment in a public and a private organization. After a conceptual analysis of the various approaches to integrity in the workplace, we expected to find two factors in the structure of the new scale. One factor representing moral integrity and commitment to principles based on the philosophical tradition of integrity, and a second factor representing overt integrity through items focusing on attitudes toward a variety of counterproductive behaviors. The expected two-factor solution was found, as well as the presence of a general factor, which is consistent with the results of other integrity tests, such as the Squares (Cut-e czech s.r.o., 2015). However, a closer look at the results suggests that a three-factor structure would be more appropriate, corresponding to the factors 'Reliability', 'Adherence to principles' and 'Moral sense'.

The final three-factor structure provided a better solution and an opportunity to better align with the theoretical background of the concept of integrity, including the distinction between the importance of the second and third factors. For example, the second factor - adherence to principles - monitors a person's identification with general or higher principles that go beyond the work environment. Adherence to principles relates to the person him/herself; the related OIS elements also relate to the person's self-concept. As described, adherence to principles is closer to Schlenker's (2008) commitment to principles. Principles are without content, items focus only on adherence to them, and respondents can think of different principles. In contrast, the third factor, moral sense, reflects applied moral principles, and this usually involves anonymous application in social space, again beyond the specific work setting. Moral sense represents attitudes or experiences on specific issues related to integrity. Finally, the first factor, called 'Reliability', is similar in both factor solutions. Reliability is best described as the image of a 'good employee' in relation to work and other people. The items are attitudinal and are applied to the work context, and in this context provide an obvious test of integrity.

Overall, the three-factor solution was supported by a CFA in a large sample of public educators in the Czech Republic and additionally verified in a second group of employees of private companies. We consider the good interpretability of the three-factor solution, the fit of the model to the data of both groups, and the satisfactory reliability as supporting elements that allow the OIS to be used for further research. Nevertheless, the OIS factor structure could be considered partially heterogeneous given its conceptual origins: It combines the philosophical and empirical traditions. From this perspective, we also suggest the possibility of selecting individual OIS factors depending on the specific goals of the research.

The results of the second study confirmed the construct validity of the new scale. The expected relationships between the OIS and conscientiousness and agreeableness were found (Ones & Viswesvaran, 2001; Schlenker, 2008). Also expected (Hoffman & Dilchert, 2012) were correlations with neuroticism, although to a lesser extent, only with the reliability factor. However, we

acknowledge some limitations. In the present study, three specific Big Five personality traits were used to test the construct validity of the OIS. Future research could extend these tests to other personality factors that have shown solid associations with tests of overt integrity in previous research (e.g., modesty, Marcus et al., 2007). In terms of criterion validity, the current results do not allow us to assess the overlap between the OIS and other standardized integrity tests because the design of the current study lacks a second integrity test. This limitation may affect the utility of the new scale, and future research should address this issue.

To test the predictive criterion validity of the new scale, we tested an approach that predicts counterproductive work behavior (CWB). In doing so, we applied several important principles, some of which have also been used in previous research (e.g., van Iddekinge et al., 2012; Ones et al., 1993). First, we deliberately selected a homogeneous group to reduce the risks of other selection types when the integrity factor might be insufficiently distributed. Another principle was the adoption of a prospective study design and a CWB measure by supervisors. Although we consider these principles essential to the aims of the study, they also have potential drawbacks. First, the above principles might be expected to lead to a lower association between integrity and CWB. Although van Iddekinge et al. (2012) reported the overall estimated observed validity, this was mainly related to established samples and the source of the criterion in self-report. In addition, the Berry et al. (2012) meta-analysis concluded that self-reports of CWB provide surprisingly richer information about employee CWB than other reports, including supervisor ratings. Despite research interest in external data (Barclay & Aquino, 2010), the superiority of third-party reports of CWB compared to self-reports can be questioned because supervisors do not have the opportunity to observe CWB of real employees (Berry et al., 2012).

Based on the results of the second study, the OIS appears to have low predictive validity of CWB. In general, the relationships among the variables of interest are relatively low, so they are not consistent with the more optimistic conclusions of previous meta-analyses (cf. Ones et al., 1993) nor with the overall estimated observed validity in meta-analysis with more stringent requirements for the included studies (van Iddekinge et al., 2012). In this sense, our results are closer to those reported by van Iddekinge et al. (2012) specifically for predictive designs, applicant samples, and non-self-report sources of criteria. As Berry et al. (2012) found, third-party reports may lead to a lower frequency of CWB observations, which is consistent with both van Iddekinge et al.'s (2012) and our results. In addition, we attribute the lower predictive power of the integrity test to the research design limitations mentioned earlier. The frequency and variability of types of CWB could naturally be lower in a stable team of employees verified by long-term working relationships, making prediction more difficult.

The results devoted to the CWB subfactors provided limited statistically significant information about the predictive power of our integrity test. However, given the low predictive power of CWB overall, no significant effects were expected. Taken together, these results suggest that the Occupational Integrity Scale can be used to some extent to predict aspects of CWB such as passive aggressiveness.

Following the above comments on the criterion validity of the OIS in units of percent of true variance explained, we cannot readily recommend the use of the scale in practice. Unlike other predictors used in personnel selection, inferences about integrity are used for adverse selection. The possible exclusion of lower integrity applicants in the OIS poses risks for further selection procedures in the absence of better indicators of criterion validity for the OIS.

In conclusion, the newly developed integrity test has good psychometric properties that support its further use in research in both public and private organizations. However, the applicability of the new scale in professional practice requires further validation work. Similarly, the OIS needs to be validated against

other integrity tests. The two studies provide important information not only about the psychometric properties of the new scale, but also about the differential relationships between the newly proposed integrity scale and facets of the CWB.

Electronic Supplementary Material

The tables S1 – S4 are freely accessible at the research repository: https://osf.io/7bx3w/?view_only=ea5a77a1b5b448cfbaf151ec913bafa

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Primary Paper Section: A**Secondary Paper Section: AN**

EVALUATION OF PROCESSES IN THE ARTS CLASS IN TERMS OF THE EDUCATIONAL PROCESS

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Abstract: The paper evaluates teaching methods in the school subject Arts on the 2nd level of primary school. The collected data were evaluated using the grounded theory, which is based on the research processes of open coding, axial coding and selective coding. The research brought about a new theory that introduces an evaluation workbook into the teaching of Arts class – a practice which is not common in Slovak schools. The evaluative research tool (non-standardized) is not only aimed at supporting and streamlining processes in Arts class, but also at motivating students in their artistic endeavours.

Keywords: open coding, axial coding, selective coding, evaluation workbook, evaluates teaching methods, evaluation in the arts class.

Introduction

Arts class is built on the knowledge that not all learning can be mediated through language alone (Valachová et al., 2019). Therefore, the arts, as a medium, supports learning, communication and self-expression. Students' artistic creations should follow goals of an artistic activity. Setting individual goals, as opposed to setting a uniform goal for the whole class, will help students think about the ways to achieve this goal. The uniqueness of the personal goal stimulates internal motivation in the student (Pretty, 1996). The most important thing here is to plan specific steps and choose strategies to achieve them. In order not to deviate from the goal, the entire process must be monitored and continuously reflected upon (Kováčová, 2020). Reflection can help students identify a problem for which a suitable solution will need to be found. Being aware of specific strategies to solve a problem can bring a deeper understanding of the essence of the solution. Such solution could be used to solve other problems as well. The artistic process, as described above, is made up of several elements of self-regulation. Therefore, it appears to be a suitable means for personal growth and development. The result of such development, as claimed by Wolters (2003, p. 189), is *autonomous, reflective and effective students - students who have cognitive and metacognitive abilities as well as the motivation and attitudes necessary to understand, monitor and guide their own learning process*. The aforementioned author also admits a change in metacognitive abilities, which are defined as the conscious control and management of one's own cognitive processes, the purpose of which is to learn as effective as possible and to progress towards achieving set goals (Popham, 1975; Benčíč, et al., 2020, Valachová, 2022).

1 Evaluation in the Arts class

The learning results can be evaluated in several ways. Tests are mainly used to determine cognitive results (knowledge) and, less often, skills and attitudes. These educational results are determined almost exclusively in individual subjects. Delacruz (1994), Fisher (1994), Průcha, Walterová, Mareš (2009), Stufflebeam (2000), Valachová (2011), Kováčová (2015) state the following methods of determining educational results:

- 1) Comparison of educational results in one subject between different types of schools. Such comparison shows how the educational results of a specific subject are shaped by a different type of school.
- 2) Comparison of educational results at the same type of school between individual subjects.
- 3) Evaluation of educational results of school graduates. This evaluation aims at finding out the educational results of students who have graduated from a primary school and

are coming to a secondary school, or secondary school graduates who are coming to a university.

- 4) Comprehensive evaluation of educational results and their determinants.

For the research hereunder, a comprehensive evaluation of educational results and their determinants seems to be the most suitable method (Gavora, 2008). In the evaluation process, the teacher can monitor the following aspects:

- 1) The course of children's artistic activity and their artistic expression. Specifically, the effects of education on children's artistic dispositions, such as artistic sensitivity, creative imagination and fantasy, and of course creative thinking.
- 2) Children's behavior related to evaluation, artistic creativity and artistic perception. The upbringing influences the general creative, ethical and intellectual dispositions of children.
- 3) Own actions during educational activities. The teacher's teaching preferences and psychodidactic dispositions play a role here. The teacher's assessment, which is intuitive, is essentially complex. It is an immediate reaction, an assessment and an immediate feeling one gets from the given art work in the form of a verbal statement (Valachová, 2011).

It still remains questionable whether the learning results of the Arts class are to be evaluated using a standardized test. There are still many voices that question its use, but for the sake of an argument we would like to use an example from Finland. The Finnish school system regularly achieves excellent results in the PISA assessment (Laitinen et al. 2011). In 2010, Finland carried out the first evaluation of art education in the national education system focused on learning results from the subjects Music, Visual arts and Crafts in the ninth grade. Specifically, this report describes the evaluation that was carried out on a sample of 152 primary schools with a total number of 4,792 students. The structure of the evaluation was as follows: First stage – all students completed a general written task/test (pencil-and-paper task), which included all 3 subjects. In the second stage, schools were divided according to subjects into three groups. In each school, students then took a test (pencil-and-paper) on a specific subject. Later, some students were given creative tasks (production assignments) from the same subject. The evaluation also included a questionnaire for principals and teachers on the Arts teaching and possible obstacles in the educational process. The students provided information about the learning process and the competences achieved in these subjects. (Laitinen, et al., 2011). This evaluation is interesting for us from several points of view. The way the Arts was evaluated in Finland makes a strong argument for starting similar processes also in Slovakia.

2 Research design

The research focuses on the Arts assessment from the student's point of view at the end of primary education. The broad term assessment could be understood here as an attitude of students towards the assessment in the Arts class and the place self-assessment has in this subject. As part of the research, we have introduced a teaching aid into the educational process – the Arts workbook (Kmet', 2020). Through the use of a non-standardized evaluation tool and teaching, we wanted to examine the students' attitudes towards evaluation and proposed changes. The workbook was also useful in self-evaluation (critical thinking). We were interested in the students' attitudes towards evaluation, which is closely connected with self-evaluation and understanding of evaluation processes in Arts (Valachová, 2011). The research was further specified in research objectives and research questions (Gavora, 2008; Betz, 2009).

The aim of the research was to examine the issue of evaluation and self-evaluation in the school subject Arts. Using research methods hereunder, the aim was to find out how the introduction of a workbook into Arts affects the students' attitude to evaluation and self-evaluation in this subject. Another aim was to find out the relationships between evaluation, learning and creative activities in Arts classes in primary education. The target group of the research was the fourth grade students (elementary school, Kmeť, 2018). In order to integrate this non-standardized evaluation tool into the teaching process and to study the impact this element would have on a specific phenomenon (evaluation) we implemented the participant observation research method.

The aim was to obtain data that will become the basis of the proposed theory. Aware of the methodological specifics of qualitative research, and with an increasing number of research questions, we determined that the method is definitive when additional data no longer contribute to a better understanding of the given concept (saturation).

In our case, we chose the method of an unstructured observation. The observation was carried out at fourteen meetings (the fifteenth meeting was dedicated to personal interviews, Gavora, 2008). Each session lasted two 45-minute lessons plus a ten-minute break in between lessons. The total observation time was 46.66 hours (sixty minutes-long hours). We performed an analysis of the Arts portfolio. In order to better understand the individual phenomena detected during the observation, we decided to supplement data using another research method: the analysis of personal documents. After getting all the information necessary, we proceeded to the last research method. As the two previous methods expanded the number of research questions, they provided us with data to formulate certain theories, which we tried to supplement with the third research method. The third research method was a group interview. When creating a discussion group, not only the number of members is important, but also internal homogeneity plays a crucial part. It is mainly about equality in terms of education and social position. Inequality of members of the discussion group could distort the results and bring imbalance to the group (in favour of the dominant participant). A characteristic feature of this method is that discussion plays a crucial role. The researcher acted as a host, who managed the discussion. Data were obtained in the form of video recordings. The interviews were conducted in a safe and undisturbed environment of the school library. The length of the interviews ranged from 20 to 25 minutes per student. The interview was semi-structured.

3 Research part

The research was carried out over a period of one and a half years. As it was a qualitative research, we have set up a general framework. The first part of the research (participant observation) was finished following a personal interview with the participants, during which topics related to the research were discussed in depth with each participant individually. This interview provided enough qualitative data to obtain basic codes. We used the time gap between individual stages to verify the stability of the information obtained over the course of four months during which students worked with their workbook in the Arts classes.

The group interview followed six months after the end of the participant observation. The fact that the pupils got older (half a year older) helped us as students became mentally and intellectually more mature. This could have a positive effect on their ability to express their opinion and engage in discussion. To evaluate the collected data, we used the "grounded theory" research method, which relies on three main research processes: open coding, axial coding, and selective coding. In the first step of open coding, we subjected the obtained data to a thorough study with the aim of creating conceptual labels.

This process is also called phenomenon labelling. There are several approaches to analyze transcript texts. The essence of

this process is the analysis and conceptualization of the observation itself or the word (in both cases, the transcription of what was seen and heard). When analysing a specific transcript, it is possible to focus on individual words, on sentences as a whole or on paragraphs of the text. We chose a word-by-word analysis approach. The reason for choosing such an approach was the fact that we are working with information provided by children - students around the age of ten. Their verbal expression skills are not developed to such an extent that their statements would form coherent paragraphs of the text (in the transcript). In qualitative research, one of the most demanding operations is the processing a large amount of information and ongoing results overview (Švec, 2000; Gavora, 2010; Švec, 2011; Ševčovič et al., 2022).

4 Results evaluation

The complex and most common phenomenon that appeared throughout the research was calling the art activities "learning". After the introduction of a non-standardized evaluation tool (hereinafter referred to as tool), students began to talk about the activities they have been pursuing in the class as "we are learning" compared to the previous one "we only draw and paint".

Despite this, the majority of students described self-evaluation in the Arts class as very useful. They learned to present their work, because they do not do that in other subjects. Some students presented their work independently in front of the whole class for the first time (the projects they do and present on other subjects are often group work). Acceptance of "learning" in the Arts class was very high among the students. In contrast to this, low activity in specific learning processes was detected (e.g. not bringing a notebook to class, a passive approach to writing in a notebook, etc.). This could be explained (partially) as a side effect of introducing the novelty approach. The students were not used to using the tool, which might explain the passivity. The students had not yet realized the need to use the workbook for their own benefit. Wide acceptance of this approach and the tool could be expected after a longer period of time (1-2 years) when evaluation and self-evaluation of the artistic skills will take place. A significant and surprising result was that students perceived the central category "learning" to be related to the category "freedom". Based on the results of the research, we can say that the students perceived the variety of teaching methods as being given more "freedom". The claim is based on data analysis of student comparisons of activities in a regular Arts class before the introduction of the workbook. The students contrasted the old learning method (drawing and painting on defined topics) with being allowed to use the variety of art techniques, writing tests and working with the workbook. Nevertheless, writing in the workbook appeared to be perceived as the biggest negative of the established teaching aid.

Some students mentioned the joy of learning in the Arts class. The fun form of conveying knowledge and using this knowledge in the final art work and in the self-evaluation presentation resulted in high acceptance of the entire learning process. Having established the relationship between the category "learning" and "authority", we found the following: If the authority is in the position of causal conditions (the scheme above), learning means that students the expectations of the authority. If authority is moved to the position of "context" on the same level as, for example, an Arts class evaluation tool, the authority becomes a source of communication. If the authority is in the position of the causal conditions during the self-evaluation, the self-evaluation would not fulfill its purpose (of reflection).

The demands of authority could significantly influence the depth of reflection. The student would try to fulfill the expectations placed on him with his performance and prioritize them over being honest about the results of the self-assessment. The authority must therefore identify with the position of "context" (see above), where the teacher/parent in the position of authority can act as a communication partner. The reflection activity is

transferred to the student. Self-evaluation based on entries in the workbook was only partial. Taking notes for the presentation was described as useful, but after several presentations it was deemed as unnecessary. The reason for the change in attitude was that the student improved his self-evaluation skills. We did not manage to obtain long-term self-evaluation data (Gavora, 2008).

We consider it very important that students learn to be aware of errors in the creation process that lead to unwanted results already on the first stage of primary school. It is certainly naive to think that the ability to reflect on mistakes and the ability to accept them was created in such a short time (research period). This example shows us when and how the progress in question has taken place. During the research, the teacher drew attention several times to making mistakes, in particular redrawing and erasing. The goal was to draw students' attention to the importance of making mistakes and their identification in the creative process. The evaluation tool as well as the artistic portfolio show two different approaches to making errors. Crossing out is a definitive sign of an error with the possibility of making a correct statement in a new place. Erasing gives us the possibility to correct the mistake in the same place. This process may not have a visible trace, and therefore it is good to reflect on the creation process right away (or short period of time). The records in the evaluation tool lacked the necessary quality and frequency. Self-evaluation in the form of a presentation was viewed positively by the students. The reasons given included the development of presentation skills and lower levels of shyness (Valachová et al., 2019; Kmeť, 2020).

Several students refused to have the presentation evaluated (as part of the end-of-the-year summative evaluation) as they were afraid their grade would get lowered. The qualitative research based on the grounded theory methodology gave rise to a theory that we defined in the Selective Coding scheme (Švec, 2011).

5 Conclusion

The theory we have proposed could be verified in the context of other theories. By doing so, the field can move forward. As far as practical implications are concerned, the results could be transformed into recommendations. In order for art teachers to be able to use more diverse didactic methods, to support the development of a wider range of abilities in students, to allow students greater freedom in the way students realize their own ideas and creativity, we recommend introducing the evaluation tool (individual for each student) into the Arts class.

It is necessary to point out that the mere enforcement of one's own understanding of the rules without making sure that students understand them can lead to a distortion of the perception of the teacher's authority and also to a distortion of the Arts class as a whole.

The consequences related to this phenomenon are far-reaching, especially in terms of how students perceive authorities (students talk disrespectfully and derogatorily about the authority). If a student declares that the teacher gives them grades "on a whim", what he is actually saying is that anyone could do what a trained teacher does. In such a case, it is extremely important to use comprehensible evaluation criteria to build a natural authority. For students to understand that, we need to help them develop metacognitive skills in understanding the use of individual criteria and their meaning (Ševčovič, 2021; Turon, Kubik, Ševčovič, Tóth, Lakatoš, 2022).

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GENDER-INCLUSIVE LANGUAGE IN THE LINGUISTIC LANDSCAPE OF BANSKÁ BYSTRICA DURING THE CORONAVIRUS PANDEMIC

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The study has been created within the APVV-18-0115 *Jazyk v meste – dokumentovanie multimodálnej semiosféry jazykovej krajiny na Slovensku a z komparatívnej perspektívy/Language in the City – Documenting the Multimodal Semiosphere of Linguistic Landscapes in Slovakia and in a Comparative Perspective project.*

Abstract: The present study deals with the use of gender-inclusive language on hygiene notices that were placed on public facilities (shops, banks, churches, museums) on the Dolná Street and SNP Square in Banská Bystrica (Slovakia) during the coronavirus pandemic. This phenomenon is examined in the context of the pandemic situation caused by the Coronavirus, as well as in the context of the current European gender policy and the application of gender-inclusive language in Slovakia. For the sake of comparison, attention is also paid to hygiene notices in Munich (Germany).

Keywords: linguistic landscape, hygiene notices, Coronavirus pandemic, gender inclusive language, Slovakia

1 Introduction

Linguistic landscape is a rapidly developing area of research in sociolinguistics; it deals with the written instances of a language found in the public space. It describes an everyday phenomenon and at the same time, a professional paradigm focused on investigating how written language is used in the public space. Linguistic landscapes take the form of a visualised language such as signs, posters, noticeboards, advertisements, etc. and can be considered typical for the 20th century. Over the years, they have been growing and become an inseparable part of the landscape transformed by humans, and in some cases, even a typical sign of the urban space. Although linguistic landscapes are not necessarily multilingual, research tends to focus specifically on those. They are perceived as phenomena typical for the postmodern urban spaces shared by several coexisting ethnolinguistic groups. The specific path of linguistic landscape formation is interpreted as a footprint and symbol of this coexistence. The term linguistic landscape has been coined by Landry and Bourhis who define it as follows: *"the language of public road signs, advertising billboards, street names, place names, commercial shop signs, and public signs on government buildings combines to form the linguistic landscape of a given territory, region, or urban agglomeration"* (Landry and Bourhis, 1997, p. 25). Gorter describes linguistic landscape as the use of written language in a public space (Gorter, 2006, p. 2). Linguistic landscape refers to any written sign placed in the external or internal premises of a public institution, private shop or company in the given geographic location. Besides the official signs such as street signs, institution or shop signs, these include also notices placed on buildings and shops such as bans and orders regarding certain behaviour, actions taken in a specific space, advertising posters, private notices, and even forms of artistic expression such as graffiti on the walls of buildings or gutters.

According to multiple authors, the written signs fulfil two basic functions: informative and symbolic. The informative function helps define the borders of the linguistic groups and indicates what languages are used to communicate in the area. The symbolic function refers to the value of the language as perceived by its users in comparison with other languages (compare Cenoz and Gorter, 2009, p. 56). The written signs can also be categorised as official and unofficial. Official signs are regulated by the government and similar institutions while unofficial signs are posted by private entities and institutions (compare Ben-Rafael et al., 2006). Landry and Bourhis (1997, p. 27) have pointed out that in some cases, the linguistic profile of the governmental signs is more or less similar to that of the private ones, creating a consistent and coherent linguistic landscape. However, in some cases, the linguistic profile of the

private signs can be significantly different. Mainly private signs are often highly variable. Research studies have pointed out that linguistic signs are not used randomly in the public space. According to some authors, the public sphere is a very competitive environment (Ben-Rafael, 2009, p. 44). The presence (or absence) of a language in a public space indicates the language policy and practice in the given country and place. On one hand, there are "top-down" aspects of the linguistic landscape, which result from the linguistic policy in the traditional sense. For instance, if the public places, streets, and buildings are marked in two or more languages, it reflects the political will to acknowledge and respect multilingualism in the area. However, the bottom-up components of the linguistic landscape also have a political dimension; using and preferring a specific language or its form reflect identity and will of individuals or civil society. As can be seen, linguistic landscape is closely connected with the language policy. The notices found in the public space also reflect the current events in society and speak about certain social and political phenomena. For example, the COVID-19 pandemic, which has affected Slovakia just like other European countries. In terms of linguistic landscape research, this study aims to deal with the notices about the current hygiene measures related to the Coronavirus pandemic found on shops, banks, churches, museums, and other public establishments in the selected parts of Banská Bystrica, Slovakia. The focus will be on the way gender-balanced language is used to address the recipients. This phenomenon was investigated in the context of the pandemic situation caused by the Coronavirus and the related legal regulations specifying the compliance with the hygiene measures upon entrance into internal premises of facilities, as well as in the context of the current European gender policy and the application of gender-inclusive language in Slovakia. For the sake of comparison, we also pointed out the hygiene notices in Munich, Germany.

2 The SARS-CoV-2 pandemic measures in Slovakia

The world-wide COVID-19 (derived from "Coronavirus disease") pandemic has affected Slovakia as well. For the first time, this type of Coronavirus was reported in Wuhan, China in December 2019; it is officially known as SARS-CoV-2. The World Health Organisation announced a public health emergency on 30 January 2020, and on 11 March, the pandemic was confirmed. The number of people infected with this virus has been steadily increasing and has claimed many lives. The airborne virus spreads mostly through close physical contact: tiny droplets or aerosols are produced by the infected person when they breathe, cough, sneeze, or talk. It can also spread through contaminated surfaces. The most frequent symptoms include fever, cough, exhaustion, difficulty breathing, and loss of smell. The complications include pneumonia and acute respiratory distress syndrome.

Authorities around the world have responded by implementing travel restrictions, traffic closures, safety inspections at workplaces, and in many countries, in a certain period of time, closing operations and introducing the recommended hygiene measures in the publicly available spaces. The pandemic has also caused global social and economic disruption including the biggest global recession since the Great Depression. It resulted in postponing and cancelling many sports, religious, political, and cultural events; education institutions have been partly or completely closed, and many switched to online teaching. The EU and its member states have adopted various measures to mitigate the social and economic impact of COVID-19 and support the recovery between 2020 and 2022. At the time of this linguistic landscape research in January 2022, general hygiene measures were in force for all operations, shops, and services in Slovakia, according to which the number of customers at the given time could not exceed the concentration of one person per 15m² in the sales area designed for customers (however, it did not apply to children younger than 14 years accompanied by an

adult). The business owners were obliged to frequently ventilate the premises and regularly disinfect the touched surfaces, doorknobs, trolleys and baskets, devices, tools, etc. using virucidal disinfectants. Grocery shops, public catering facilities including fast food stands and other street sellers of food and drinks had to ensure regular cleaning and disinfection in terms of their daily sanitation regime pursuant to the correct hygiene practice. In Slovakia all business owners were obliged to: allow only persons with covered mouth and nose (face mask, respirator without an exhalation valve, scarf) into the premises. Upon entrance, all persons were obliged to apply hand disinfection or use the disposable gloves provided and keep their distance from other customers in the line. Pursuant to the regulations, the business owners were obliged to post notices on the necessity to comply with the aforementioned hygiene measures in visible places at all entrances into the premises. These notices will be investigated in this study.

3 Gender policy and the use of gender-inclusive language in international contexts

Although gender policy is quite young in comparison to other public policies, its roots can be traced back to the 17th and 18th centuries when the activities focused on battling discrimination and promoting women's rights started. The Second Wave Feminism in the second half of the 20th century played a major role in the establishment of gender policy. During this time, the main philosophy of gender policy was formulated, which applies currently. The point of gender policy is to ensure that biological differences are not used to create social differences (Pietruchová and Magurová, 2011, p. 10). Since its establishment, the EU has been striving to enhance the social dimension of Europe and reach equality between men and women. However, the complete system aiming to formulate and enforce non-discrimination rules in science, politics, employment, law, education, family life, language, etc. was only established at the end of the 20th century. As for the EU legislative framework, it draws from the *Universal Declaration of Human Rights* of 1948, the basic international document, which specifies that no one must be discriminated based on their sex, race, skin colour, language, religion, political views, national or social origin, or affiliation to a national minority, or property. The policy of gender equality has been promoted by numerous international agreements, conventions, and action platforms. The Treaty of Amsterdam (1999) specifies equality as the central aspect and one of the main goals to be achieved by the EU. This treaty also defines *gender mainstreaming* as the EU strategy to achieve gender equality in all areas of public and private life. Upon accession to the EU, all member states have undertaken to apply the principle in their policies. *Gender mainstreaming* is a horizontal approach, i.e. a cross-cutting policy implemented by all ministries. However, gender equality, i.e. equality of men and women, can only be achieved if this goal is shared by all areas of politics, including the language policy, i.e. a policy of gender equality in language. The policy of gender equality has also been promoted by a number of documents adopted at the *Fifth Conference on Women (Beijing +5)* in 2000 in New York and *Beijing +15 – UN Platform for Action for Gender Equality* at which further measures and initiatives were adopted to enforce the Beijing Declaration and the Platform for Action.

Along with the development of gender policy and women's rights, the gender-balanced/inclusive language and its use evolved. This gradual process has not been easy. Before the *Universal Declaration of Human Rights* (1948) was formulated, a lengthy discussion took place until finally, the gender-balanced language was used. Recommendation R(84) 17 on the equality of women and men in media of 1984 includes a provision addressing the research of non-sexist language use. In 1990, the Council of Europe adopted Recommendation No. R (90) 4 of the Committee of Ministers to member states on the elimination of sexism from language. The Committee of Ministers recommended that all member states support using language promoting the principle of gender equality and adopt the measures aimed to achieve the following goals: support non-sexist language as much as possible to respect women's

presence, positions, and tasks in society as they are respected in men; harmonise the terminology used in legal texts, public administration, and education with the principle of gender equality; promote using gender-balanced language in media. Since 1990, the use of gender-balanced language in official and everyday communication in the EU member states significantly progressed and further recommendations followed, e.g. Recommendation *Rec (2003) 3 of the Committee of Ministers to member states on balanced participation of women and men in political and public decision making* of 2003 and Recommendation *CM/Rec (2007) 17 of the Committee of Ministers to member states on gender equality standards and mechanisms* of November 2007. Pursuant to the recommendation of 2007, the member states should follow the guidelines requiring the use of gender-balanced language in the official documents, specifically in legal texts, official communication, education, and media. The Council of Europe member states were also supposed to adopt administrative measures ensuring that the official language would reflect the fact that men and women had equal power (see Terkanič, 2014 in Cviková et al., 2014). However, the Council of Europe does not limit itself to these recommendations. It has also adopted guidelines addressing the specific use of gender-balanced language. They have been published in two official languages of the Council, English and French, with a recommendation to adapt them in other languages. In all its documents, the Council of Europe has also committed to refrain from using sexist language and it has been striving to fulfil this commitment since. The European Parliament first called for gender equality in language in the *Resolution of 13 March 2003 on gender mainstreaming in the European Parliament*. In 2008, the European Parliament published *Gender-neutral language in the European Parliament*, a booklet on the use of gender-neutral and non-sexist language in parliamentary texts. The brochure, translated into all official EU languages, contains a set of guidelines to ensure that as far as possible gender-neutral language is the norm rather than the exception in parliamentary documents. These guidelines were intended as an "invitation" to administrative staff to apply these guidelines in all parliamentary documents and written communications. In July 2018, the European Parliament published the handbook *Gender neutrality in the language used in the European Parliament*, which contains guidelines for Members and officials on the use of gender-neutral language in institutional communication and the regulatory process. In 2018, the Council of Europe Secretary General's office published guidelines entitled *Inclusive Communication in the GSC* in all official languages of the EU, including Slovak. These guidelines are language-specific since these languages differ in terms of grammar, syntax, and style. However, all of them promote inclusion and diversity through language and visual tools in the Council of Europe. The guidelines include tips for neutral communication in relation to men and women, person with disabilities, and other groups, however, legal regulations are not included. The Slovak version provides examples from the Slovak language practice relevant not only for the Council of Europe Secretary General's office, but in everyday communication as well – it can help Slovak speakers avoid the inadvertent use of discriminatory language (compare Štefaňáková, 2020, p. 86).

From a variety of perspectives, linguistic research has confirmed that besides communication and description of reality, language is also used to shape it. In the EU, UN, Council of Europe and in developed countries, the importance of using inclusive and non-discriminatory language, which does not exclude women, is rarely diminished. Many countries around the world as well as international organisations follow political and legal standards that promote, specify, and use gender-balanced language (compare Štefaňáková, 2020). In Slovakia, this discussion has started with considerable caution and even today, it still remains misunderstood in certain circles. Since this study investigates this phenomenon in the context of linguistic landscape and compares the Slovak and German legislations, the following part will focus on the gender equality legislative frameworks and the use of gender-balanced language in these two countries.

4 Gender policy and gender-inclusive language in Slovakia

In the area of gender equality and non-discrimination, Slovakia as an EU member state is bound by several international documents implemented into the legislation as well as practice. The most important include: Universal Declaration of Human Rights, International Convention on the Elimination of All Forms of Racial Discrimination, UN Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) and its Optional Protocol, Declaration on the Elimination of Violence Against Women, International Pact on Economic, Social and Cultural Rights, International Covenant on Civil and Political Rights European Convention on Human Rights and Fundamental Freedoms and its amendments and appendices, International Labour Organisation's Convention, European Social Charter, UN Convention on the Rights of Persons with Disabilities, and other. Although the legislation on the equality of men and women and other genders has been available on the international level for some time, in Slovakia, the interest in the legislation regarding gender-balanced language could only be observed in the recent decades.

In the Slovak Republic, the issue of gender equality has been addressed by the special legislation. Mainly the *Anti-Discrimination Act* is of importance, which explicitly states the causes of discrimination in Article 2. The Act defines the principle of equal treatment for men and women in the specified areas. It transposes the legal acts of the EU and applies this principle to social security, health care, provision of goods and services, education, employment relationships and other legal relationships. The *Anti-Discrimination Act* distinguishes several types of discrimination based on sexist language, but does not explicitly state the requirement for using gender-balanced language. However, Terkanič has pointed out that using sexist language can be considered discrimination based on the circumstances. He defines sexist language as a form of discriminatory language, which employs exclusion, trivialisation, or derogation (usually) of women. It takes a variety of forms including making women invisible in the language (by using the masculine grammatical gender to refer to e.g. politicians), asymmetrical labelling (e.g. a woman prime minister), or stereotypical labelling (nurse – female, doctor – male). Terkanič analysed the *Anti-Discrimination Act* to study discrimination through language from different perspectives. In terms of the Act, mainly extreme instances of ignoring the gender-balanced language are considered discriminatory; these take the form of verbal (and non-verbal) sexual harassment “whose intention or consequence is or can be violation of a person's dignity, and which creates threatening, degrading, dishonouring, hostile, or abusive environment” (Section 2a, Par. 5 of the Act – compare Terkanič in Cviková et al., 2014, p. 36). As for the Slovak legislative framework, there are no laws as of today that would explicitly restrict sexist language or require the use of gender-balanced/non-sexist language in the given areas. On the other hand, German-speaking countries have this kind of legislation as well as recommendations, strategies, and specific language for addressing persons in a gender-balanced way. In Slovakia, only partial non-governmental initiatives to reveal and prevent discrimination through language can be observed so far. The interest in gender-balanced/gender-inclusive language in Slovakia reflects in a variety of ethical codes, internal company rules, private legal contracts, agreements, and other documents, however, the wider public is not aware of these. An example of the increasing interest in gender-balanced language in Slovakia can be seen in the activity of the Advertising Standards Council (ASC), the authority for ethical self-regulation in advertising. In 2014, the ASC General Assembly adopted several changes to its Code of Ethics based on which its Arbitration Commission evaluates the complaints about advertisements. In terms of gender-balanced language, the initiatives aim mainly to eliminate sexist language in the public sphere. One of the most important awareness raising initiatives in Slovakia is the publication of *Analýza významu a možností používania rodovo vyváženého jazyka/Analysing the Importance and Possibilities of Using Gender-Balanced Language* (Cviková et al., 2014). The publication has been created under the Sociolinguistic Research

project performed by the Institute for Gender Equality along with a manual of gender-sensitive language. The author collective challenged the neutrality of the *generic masculine* and proposed two approaches to establishing the gender balance in the language: *gender specification* and *gender neutralisation*. *Gender specification* means explicit use of the gender; strict gender differentiation is observed and *generic masculine* is replaced by both grammatical genders, either in the form of a double reference, e.g. *zamestnanci a zamestnankyne* (meaning male and female clients or employees), or gender doublets divided by a slash (female gender is marked by the grammatical morpheme) *zamestnanci/zamestnankyne, zamestnanci/-kyne*. The second alternative is *gender neutralisation*, which replaces generic masculine; in Slovak, the strategy is characterised by avoiding the use of language means, which require the expression of the grammatical gender. Instead of using masculine, a group, abstract, or general reference can be used. Since Slovak is a fusional language, the possibilities of neutralisation are limited (Cviková, 2014, p. 5). However, the following examples can be specified (m. – masculine, f. – feminine, n. – neutral expression, a. – abstract, g. – group): *učiteľský zbor* (g. *teaching staff*) or *vyučujúci* (g. *teaching staff*) instead of *učitelia* (m. *teachers*); *vedenie* (a. *management*) instead of *riaditeľ* (m. *director*), *zdravotnícky personál* (g. *health workers*) instead of *lekári a sestričky* (m. *doctors* and f. *nurses*); *poslanectvo* (n./g. *members of the parliament*) instead of m. *poslanci*; *senátorstvo* (n./g. *senators*) instead of m. *senátori*. (Košková – Satola-Staškoviaková, 2017). In Slovak (in terms of gender-balanced language), there are also words that have grammatical gender, but are not considered marked in terms of natural gender. E.g. *človek/ludia* and *osoba/osoby* (sg. and pl. of *man* meaning a human and *person*) are masculine, and *starostlivosť o maloleté osoby* (*maloletý* = m. *minors* are replaced by *maloleté osoby* = n. *minor persons* in the phrase *care for minors*) or *aj títo ľudia majú právo na rovnaké zaobchádzanie* (*these people have the right for equal treatment too*), etc. Generic masculine references can also be replaced by an adjective, e.g. *Hlavné body ministerského zasadnutia v Tallinne* (*Main points of the ministerial meeting in Tallinn* (instead of *zasadnutie ministrov* = *meeting of m. ministers*; see Inclusive Communication in the GSC, guidelines published by the Council of Europe Secretary General's office, 2018). A further initiative to raise awareness of the phenomenon is a manual entitled *Ako používať rodovo vyvážený jazyk. Možnosti, otázky, príklady/How to Use Gender-Balanced-Lanugage. Possibilities, Questions, Examples* (Cviková et al., 2014). Besides general discourse about gender issues, it also provides examples and inspiration on how gender-balanced Slovak language can be used in the public sphere. In the chapter entitled “Would a man sign a contract referring to him as if he was a female employee?”, the authors have pointed out that many female job seekers are confronted with discriminatory work contracts which refer to them as if they were males. Referring to the contractual parties as if they were exclusively male fails to provide gender neutrality, therefore even a contract can be discriminatory. The authors claim that contract templates also play a role in the gender imbalance in the area of business and civil legal relationships.

The presented analysis indicates that although using gender-inclusive language in Slovakia has not been explicitly specified by any law, the public is becoming aware of inclusive language thanks to a variety of initiatives and publications. It can be observed mainly in the written form in the public spheres and journalism as has been confirmed by research focused on gender-balanced language in the journalistic texts. The corpus analysis was performed on the Slovak National Corpus (see Štefaňáková, 2020). The question addressed by this study can be formulated as follows: What is the linguistic practice in addressing persons, i.e. using gender-inclusive language, in public notices in today's linguistic landscape? Specifically, the public notices posted in the Banská Bystrica city centre informing people about the obligation to respect the hygiene measures upon entering premises of certain facilities will be analysed. The analysed situation is specific since it has been caused by the Coronavirus pandemic. The business owners had

to post these notices based on the regulations issued by the Slovak Government.

5 Gender-inclusive language and its use in the notices regarding the Coronavirus pandemic-related hygiene measures in Banská Bystrica

In accordance with the goal of this study, the notices about the Coronavirus pandemic-related hygiene measures posted on shops, banks, churches, museums and other public facilities on the Dolná Street and Námestie SNP Square in Banská Bystrica in January 2022 will be analysed. The primary intention was to reveal whether the verbal or non-verbal notices prevail. In the case of verbal notices about hygiene instructions, the style of addressing the recipients will be investigated, i.e. whether generic masculine, gender-inclusive, or neutral addressing prevail. This phenomenon is researched in the context of the Coronavirus pandemic situation in Slovakia, current regulations specifying the hygiene measures upon entering internal premises of the facilities, and the current possibilities of using gender-balanced language in the Slovak linguistic environment. Due to the limited space, some hygiene notices will be selected to demonstrate the phenomenon. The hygiene notices on Dolná Street and Námestie SNP Square in Banská Bystrica were photographed at the beginning of January 2022. In accordance with the governmental regulations at the time, the notices had to be posted at all entrances to the facilities obliged to comply with the measures. The most important hygiene measures included the following: only persons with a covered upper respiratory tract were allowed to enter the premises, hand disinfection or disposable gloves had to be used, the number of persons was limited, and persons in the premises had to keep distance from each other.

The research of pandemic hygiene notices showed that the business owners complied with the governmental regulations. At entrances to all internal premises of facilities on Dolná Street and Námestie SNP Square in Banská Bystrica, the notices about the obligation to comply with the hygiene instructions were posted. We photographed and analyzed a total of 45 pandemic hygiene notices, which were located at 28 facilities in SNP Square and Dolna Street in Banská Bystrica. The analysis of their visual form showed that the facilities often used verbal expressions (17 hygiene notices), and most frequently, the text was combined with non-verbal elements, i.e. pictures ((28 hygiene notices). Exclusively non-verbal notices are rarely seen in the Banská Bystrica linguistic landscape. The way in which the recipients were addressed was analysed in the verbal notices to reveal how often gender-balanced language (and references) were used. The analysis drew from the current EU policy including the requirement to use gender-balanced language mainly in the public sphere in all EU member states. As it was already explained, there is no law explicitly requiring the use of gender-balanced language. However, in the area of gender equality and non-discrimination, Slovakia is bound by multiple international conventions, which should be implemented into the legislation as well as practice. In the recent years, awareness has been raised by initiatives and publications about the fact that gender-balanced language exists. The authors of the aforementioned publications offer two ways to approach the issue: *gender specification* using doublets to explicitly name men and women, or doublets using a slash (e.g. *student* – m. *štvudent* and f. *štvudentka*, pl. m. *štvudenti* and pl. f. *štvudentky*, f. *štvudentka*/m. *štvudent*, m. *štvudent*/f. *-ka*, m. pl. *štvudenti*/f. pl. *-tky*). Another approach is *gender neutralisation* which does the opposite, i.e. removes the gender completely. The excessive use of *generic masculine* is criticised as a feature shared by other Slavic languages as well. In Slovak, masculine is the referential, substitute gender in singular as well as plural nouns, and as a formal neutral marker. It is used to refer to a pair consisting of a man and a woman, or a group of persons regardless of the women's presence in it. However, feminist and gender linguistic research have challenged the neutrality of generic masculine, which resulted in the creation of various approaches and strategies replacing it in different world languages. This study focuses on the way in which the current gender-balanced

language policy is transferred into the linguistic practice in Slovakia. As the material, the notices about the pandemic hygiene measures will be used. The analysis of notices showed that generic masculine clearly prevails in addressing the recipients that was used on 39 hygiene notices as can be seen in the following examples:

... “V súvislosti s nariadením vlády SR o koronavíruse žiadame zákazníkov o dodržiavanie hygienických opatrení. ...”/“In relation to the Regulation of Government of the SR regarding the Coronavirus, we require the m. customers to comply with the hygiene measures.”; ... “Počet zákazníkov v prevádzke v jednom okamihu nesmie prekročiť koncentráciu jeden zákazník na 10m² z predajnej plochy prevádzky.”/“The number of m. customers in the premises in a single moment must not exceed the concentration of one m. customer per 10m² in the sales area.” (Fig. 1: Záložňa Brev – Bazár pawnshop and second hand store, Dolná St. 51, Banská Bystrica)

... “Vážení zákazníci, dovoľujeme si vás poprosiť o dodržiavanie zásad ÚVZSR vzhľadom ku šíreniu sa koronavírusu Covid 19...”/“Dear m. customers, we would like to kindly ask you to comply with the rules specified by the Public Health Authority of the SR due to the spread of the Covid-19 virus...” (Fig. 2: Záložňa Inbox s.r.o. pawnshop – Dolná St. 29, Banská Bystrica)

... “Pri vstupe do kultúrnej inštitúcie je navštevnik povinný použiť dezinfekciu na ruky. ...”/“Upon entering the cultural institution, the m. visitor is obliged to apply hand disinfection. ...” (Fig. 3: Central Slovakia Cultural Centre, Dolná St. 35, Banská Bystrica)

... “V kníhkupectve môže nakupovať maximálne 9 zákazníkov. ...”/“Zákazník má povinnosť nosiť rúško.”/“A maximum of 9 m. customers can be shopping in the bookshop. ...” “The m. customer is obliged to wear a face mask.” (Fig. 4: Knihy za groš bookshop, Dolná St. 55, Banská Bystrica)

... “Milí klienti, pred vstupom do Wüstenrot centra počkajte prosím na vyzvanie. Z dôvodu zamedzenia väčšieho počtu zákazníkov bude vstup na pracovisko regulovaný. ...”/“Milí klienti, vstup do Wüstenrot centra bez použitia rúška, prípadne šálu či šatky alebo inej vhodnej alternatívy sa zakazuje! Odporúčame používať aj rukavice.”/“Dear m. clients, before entering the Wüstenrot centre, please, wait for being called. To prevent a larger number of m. clients in the premises, the entry will be regulated. ...” ; ... “Dear m. clients, the entry to the Wüstenrot centre without a face mask, shawl, scarf of other suitable alternative is banned! We also recommend using gloves.” (Fig. 5: Wüstenrot stavebná sporiteľňa insurance company, a.s., Dolná St. 26, Banská Bystrica)

... “Vážení návštevníci ÚLUV-u, dovoľujeme si vás požiadať, aby ste sa neúčastňovali našich podujatí a vzdelávacích aktivít, ak: ste sa vrátili z oblasti ohrozených nákazou koronavírusu v priebehu posledných 14 dní, vykazujete príznaky ochorenia. ...”/“Dear ÚLUV m. visitors, we would like to kindly ask you not to attend our events and educational activities if: you returned from an area with risk of the Coronavirus infection during the last 14 days, you show symptoms. ...” (Fig. 6: ÚLUV – Centre For Folk Art Production, Dolná St. 14, Banská Bystrica)

... „Vážení klienti, prosíme o dodržiavanie nasledovných preventívnych opatrení proti šíreniu koronavírusu:”/“Dear m. clients, we would like to ask you to comply with the following measures aimed to limit the spread of the Coronavirus: 1. Vstup do pobočky je povolený len s prekrytím nosa a úst./The entry into the premises is allowed only with your nose and mouth covered. 2. V pobočke sa môžu vyskytovať najviac štyria klienti súčasne./A maximum of four m. clients can be present at the same time. Ak sa v pobočke nachádzajú práve štyria klienti, počkajte prosím pred vstupom do pobočky, pracovník banky vás o chvíľu vyzve na vstup./If there are currently four m. clients in the premises, please wait before you enter the premises, the m. bank employee will shortly ask you to enter. 3. Klient je pred vstupom do pobočky povinný dezinfikovať si ruky./The m. client is obliged to disinfect his hands before he enters the premises.

Zároveň je potrebné dodržiavať bezpečný odstup počas komunikácie s pracovníkom banky. /At the same time, it is also necessary to keep a safe distance while you are communicating with the m. bank employee. 4. Pracovník pobočky môže odmietnuť vstup klienta do priestorov banky, ak klient prejavuje známky choroby./A m. bank worker can also deny the m.client the entry into the premises of the bank, if the m. client shows symptoms of a disease.” (Fig. 7: OTP Banka, Námestie SNP Square 15, Banská Bystrica)

... “Počet účastníkov na verejnom slávení sv. omše je obmedzený na 5 osôb. Prosíme Vás, aby ste toto nariadenie brali do úvahy a zároveň ho rešpektovali. Po naplnení tohto limitu nebudú ďalšie osoby do katedrály vpustené.”/“The number of the m. attendees at the public celebration of the Holy Mass has been limited to 5 persons. Please, take this regulation into consideration and respect it. After the limit has been reached, no more people will be allowed into the Cathedral.”

(Fig. 8: St Francis Xavier Cathedral, Námestie SNP Square 27, Banská Bystrica)

... „Milí návštevníci, vstup do múzea je možný len s ochranným rúškom, resp. iným prekrytím horných dýchacích ciest (šatkou, šálom ...)/“Dear m. visitors, the Museum can only be entered with a face mask or otherwise covered upper respiratory tract (shawl, scarf...)” (Fig. 9: Central Slovakian Museum, Námestie SNP Square 4, Banská Bystrica)

... “Vážení zákazníci, žiadame vás o dodržiavanie opatrení Úradu verejného zdravotníctva, zodpovedným prístupom chráňte seba aj nás. ... Maximálny počet zákazníkov: 2!”/“Dear m. customers, we ask you to comply with the measures of the Public Health Authority. Let us be responsible and protect ourselves as well as the others. ... Maximum number of m. customers: 2” (Fig. 10: Slovenka outlet, Dolná St. 30, Banská Bystrica)

The provided examples of notices about hygiene measures as well as many other notices posted at the entrances into the internal premises of facilities in the Banská Bystrica city centre confirm that generic masculine is preferred when addressing persons in public spaces. Another specific example of generic masculine is the notice posted by the Elegancetravel agency, which informs about the closure of their premises due to the Coronavirus pandemic and home office until further notice. Jana Kiššová, a woman, is specified as the m. “responsible representative” in the notice, which implies that even if the person referred to is obviously a woman, masculine is still preferred in the linguistic practice (compare Fig. 11: Cestovná kancelária Elegance Travel, Dolná ul. 43, Banská Bystrica).

Usually, the notices took the text form and pictures were merely used to complement them. For instance, the notice posted by the *Gastro Walter restaurant* at Dolná St. 1 did not address their customers directly, instead, they used a picture of a man with a face mask and the text “Nosme všetci rúško!” (“Let us all wear face masks!”) Next to it, there was a notice showing pictures with the following appeals: “Zákaz vstupu bez rúška!”/“No entry without face mask!” “Používaj respiračnú ochranu: rúško, masku, polomasku, respirátor, šatku ... !”/“Use respiratory protection: face mask, mask, half mask, respirator, scarf...!”; “Vstupujte len s ochrannými rukavicami alebo si dezinfikujte ruky!”/“Enter only with protective gloves or disinfect your hands!” “Dodržujte minimálny odstup 2 m! Držte sa pokynov personálu!”/“Keep at least 2m distance! Follow the staff’s instructions!” (Fig. 12: Gastro Walter restaurant, Dolná St. 1, Banská Bystrica).

The analysis of the notices about current hygiene measures against the Coronavirus pandemic showed that gender-inclusive language was not used in the Banská Bystrica linguistic landscape. All clients, customers, visitors, attendees, and employees, etc. were addressed using generic masculine. Not in a single case was a doublet with conjunction (e.g. *účastníci a účastníčky/m. and f. attendees*) or gender specification with a slash (*účastníci/účastníčky, klienti/tky*) used, i.e. strategies

recommended in Slovak to address persons in a gender-balanced way. In some cases, neutral forms were used (6 hygiene notices), e.g. *person(s)* and exceptionally, the notices were formulated as orders and did not explicitly address the recipients, e.g. “Let us all wear face masks!” *Generic masculine* is a part of the language system deeply rooted not only in the language codes, but also in the society’s and individuals’ minds. It reflects in the way the hygiene notices were formulated: their creators automatically used generic masculine to address the recipients or refer to them. The social consciousness has just started learning to use gender-inclusive language in Slovakia and the process is going to take some time. It can be stated that using generic masculine in the public notices about hygiene measures reflects the current linguistic practice in Slovakia. The initiatives and recommendations on using gender-balanced language forms have not penetrated society yet. (compare Tab. 1: The analysis of the hygiene notices on the Dolná Street and SNP Square in Banská Bystrica).

Tab. 1: The analysis of the hygiene notices on the Dolná Street and SNP Square in Banská Bystrica

Hygiene notices on Dolná Street and SNP Square	45
Hygiene notices with verbal expression	17
Hygiene notices with verbal expression and non-verbal elements (pictures)	28
Non-verbal hygiene notices	0
Hygiene notices using a generic masculine	39
Hygiene notices using a neutral forms	6
Hygiene notices using gender-inclusive language forms	0

Since the APVV-18-0115 *Language in the City – Documenting the Multimodal Semiosphere of Linguistic Landscapes in Slovakia and in a Comparative Perspective* project focuses on the comparative aspect of linguistic landscape research, we also investigated the hygiene notices in number of public facilities located in Munich, Germany. As the Coronavirus pandemic limited travelling, and more complete documentation of the pandemic notices in specific streets or places in Munich was impossible, this research should not be considered as fully comprehensive. For the sake of comparison, only some of the hygiene notices will be selected. They were photographed by one of the members of the research team in Munich at the beginning of January 2022, i. e. roughly at the same time when the samples were collected in Banská Bystrica. Our intention was to identify whether verbal or non-verbal forms prevailed. In the case of verbal notices, the approach to addressing or referring to persons was analysed to find out whether generic masculine prevailed as in Slovakia, or gender-inclusive and neutral forms were preferred. The specificities of the German language system were taken into consideration, specifically, the existing strategies for replacing generic masculine with other ways of addressing women and men. At the time of research, the pandemic hygiene measures in Germany were the same as in Slovakia. The notices were placed visibly at all entrances to internal and external premises of facilities in Munich. The analysis showed that non-verbal hygiene notices prevailed in Munich. Often, the posters and notices about hygiene measures combined non-verbal (pictures) and verbal (text) instructions. In Munich, notices without pictures were exceptional. The analysis drew from the current language situation and policy in Germany in the area of using gender-inclusive language. Germany already has the relevant legislation specifying the use of gender-balanced language in some areas, mainly public administration. The ministries, courts, and other institutions requested guidelines for using gender-balanced German. They offer a number of approaches and strategies linguistically expressing gender equality and the ways in which to replace generic masculine as previously explained. These guidelines recommend mainly these strategies in German: *referring to both sexes using full expressions in a doublet through a conjunction, splitting: doublets with slash, splitting: doublets with brackets, Binnen-/Capital I in front of the ending*. In the recent years, specific forms were also added to address the whole spectrum of sexes: „*Gender-Gap*“ (gender underscore character – *Student_innen*)

and *Gender-Sternchen* „*“ (gender star – Student*innen), and „X-Form“ (*Dix Studierx*).

Based on the analysis of the notices about hygiene measures, it can be stated that Munich posters and notices preferred order-like and brief formulations without addressing the recipients directly. The instructions were usually accompanied by pictures visualising the respective measure or recommendation. The German posters and notices included the following examples: ... *„Beim Einkauf gilt: Maske auf!“* *Bitte halten Sie Abstand und Hygieneregeln ein! Vielen Dank!*“ (Fig. 13: Munich); ... *„Maskenpflicht im Fussgängerbereich!“* (Fig.14: Munich); ... *„Für unser aller Gesundheit: Hier nur mit Maske! Vielen Dank!“*; ... *„Bitte haben Sie einen Augenblick Geduld. Wir holen Sie gleich ab. Laut Coronavirusverordnung darf gleichzeitig nur 1 Kunde je 20qm im Shop sein!“*; ... *„Bitte beachten sie allgemeine Präventionsmaßnahmen. Vielen Dank für Ihre Unterstützung! Bitte mind. 1,5m abstand halten! Zu anderen Kunden - zum Verkaufspersonal. Bitte beachten Sie die Maskenpflicht. Bitte nutzen Sie nach Möglichkeit kontaktlose Zahlungsoptionen (per EC-/Kreditkarte).“*

The analysis showed that the styles used for addressing the public in the Slovak notices (e.g. dear customers, visitors, clients, etc.) were rarely used in Munich, instead they were formulated as orders (e.g. *Bitte Abstand halten!*/*Please, keep your distance!*) The instructions rarely addressed the recipients explicitly. The following hygiene notice which used the generic masculine form of addressing persons was rather an exception: m. ... *„Liebe Wochenmarktbesucher, bitte halten Sie mind. 1,5 m Abstand zu anderen Personen. Wenn dies nicht möglich ist, tragen Sie bitte Mund-Nasen-Bedeckung. Für Personen, die in Kontakt zu einer mit dem Coronavirus infizierten Person stehen, wenn seit dem letzten Kontakt nicht 14 Tage vergangen sind, oder die typischen Symptome einer Infektion mit dem Coronavirus (namentlich Geruchs- oder Geschmackstörungen, Fieber, Husten sowie Halsschmerzen) aufweisen, gilt ein generelles Zutrittsverbot. Herzlichen Dank für Ihr Verständnis! Dear marketplace m. visitors, please keep the distance of at least 1.5 m from other persons. If it is not possible, please protect your mouth and nose with a mask. Persons who were in contact with a person infected with the Coronavirus fewer than 14 days before, or those who show symptoms of the Coronavirus infection (specifically loss of smell and taste, fever, cough, or sore throat) are banned from entering. Thank you very much for understanding.“*

The research showed that none of the notices and posters about the hygiene measures in Munich used gender- language. None of the gender-balanced forms recommended by the numerous guidelines for using gender-balanced German was used besides neutral “person(s)”. Therefore, it can be stated that the German business owners and creators of the hygiene notices in Munich consciously combined the non-verbal instructions (pictures) with texts formulated as orders to avoid explicitly addressing the recipients or referring to them. Their goal was probably to visualise the hygiene instructions and formulate them in a gender-neutral way. The use of generic masculine in some exceptions where the recipients were directly addressed seem to result from the fact that generic masculine is deeply rooted in the society’s mind, similarly as in Slovakia.

6 Conclusion

The goal of the study was to identify how the notices about the current hygiene measures related to the Coronavirus pandemic posted on public facilities in the selected parts of Banská Bystrica, Slovakia were formulated. During the pandemic, these notices became a part of the linguistic landscape, which is closely interconnected with the language policy. The analysis focused on the gender- inclusive language in the public space – a current linguistic and political phenomenon. The phenomenon was observed in the contexts of the pandemic regulations and hygiene measures upon entering the facilities, and the current European gender and gender-balanced language policies in the Slovak Republic.

The notices with the current hygiene measures in the Banská Bystrica linguistic landscape showed that so far, public notices in the Slovak Republic did not use gender- inclusive language. As could be seen, generic masculine was used to address persons or refer to them (sg. and pl. m. client, customer, visitor, attendee, employee, etc.). Except for the neutral “person(s)”, no gender-balanced form was ever used to explicitly address men and women, i.e. a doublet with conjunction (e.g. účastníci a účastníčky/m. and f. attendees) or gender specification with a slash (účastníci/účastníčky, klienti/tky), although these forms are recommended for use in the public sphere. Exceptionally, the notices were formulated as orders or appeals without addressing anyone in particular, e.g. “Let us all wear face masks!” However, the inclination to use generic masculine in public notices about hygiene measures in the linguistic landscape of Banská Bystrica seems to draw from the deeply rooted and persisting social and individual consciousness, in which the substitute masculine is ingrained. Despite the efforts to enforce the use of gender-inclusive language based in the current European gender policy, generic masculine is still widely preferred. The research orientation of notices about hygiene measures in Munich did not confirm that explicit gender-balanced forms were used in the public space either. The preference for generic masculine in public notices can also be interpreted as a bottom-up phenomenon in the linguistic landscape; this preference results from individual will and deeply rooted society-wide consciousness alike.



Figure 1: ZALOŽNA Brevia – Bazár pawnshop and second hand store, Dolná St. 51, Banská Bystrica



Figure 2: ZALOŽNA Inbox s.r.o. pawnshop – Dolná St. 29, Banská Bystrica



Figure 3: Central Slovakia Cultural Centre, Dolná St. 35, Banská Bystrica



Figure 7: OTP Banka, Námestie SNP Square 15, Banská Bystrica



Figure 4: Knihy za groš bookshop, Dolná St. 55, Banská Bystrica



Figure 8: St Francis Xavier Cathedral, Námestie SNP Square 27, Banská Bystrica



Figure 5: Wüstenrot stavebná sporiteľňa insurance company, a.s., Dolná St. 26, Banská Bystrica



Figure 9: Central Slovakian Museum, Námestie SNP Square 4, Banská Bystrica



Figure 6: ÚLUV – Centre For Folk Art Production, Dolná St. 14, Banská Bystrica



Figure 10: Slovenka outlet, Dolná St. 30, Banská Bystrica



Figure 11: Cestovná kancelária Elegance Travel, Dolná ul. 43, Banská Bystrica



Figure 12: Gastro Walter restaurant, Dolná St. 1, Banská Bystrica



Figure 13: Munich



Figure 14: Munich

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THE RELATIONSHIP BETWEEN HUMAN DEVELOPMENT AND THE LEVEL OF DIGITALIZATION IN THE COUNTRIES OF THE EUROPEAN UNION AND LATIN AMERICA

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Abstract: The purpose of this article is to compare the level of digitization and technical development of LA countries and Europe based on the correlation coefficient between CISCO and HDI countries from these regions. The descriptive statistics summary of used variables, along with the correlation coefficients, measured on both regions separately to compare them together have been calculated. The countries' selection in each of the regions fulfilled the criteria of values presence simultaneously in the Cisco Digital Readiness Index of 2019 and the Human Development Index of 2019, as the most recent time horizon of calculated indicator. The hypothesis tests have been tested whether the regression parameters were significant, and the p-values were analysed, indicating the smallest level of significance for the null hypothesis (non-significant parameters) to be rejected. The results were analysed according to the countries that are part of each region and their level of development to justify them. The results show that the variables have been correlated and that Europe has demonstrated higher average values for both indexes compared to the Latin America. The main results have been commented accordingly to the levels of development of the member countries of both regions, together with the consequences of digitalization.

Keywords: Digitalization, digital adoption, human development, Europe, Latin America

1 Introduction

The Fourth Industrial Revolution has come, and the world must adapt to innovations. It changes the way it interacts in society, the way people consume, live and work. However, this agile process represents a new stage that is taking place in connection with the new digital age and involves people, technology, sustainability, risks and opportunities (de Hoyos Guevara et al., 2020). The rapid technological progress of the 21st century is already becoming a reality, leading to the digitization of simple routine tasks in changes, both in industrial processes, and in the daily lives of the population.

Technologies, such as the internet of things, the internet of services, augmented reality, smart factories, or artificial intelligence, affect significantly not only production processes and business operations, but also the way of life and behaviour of the entire population (Bag et al., 2018). Since the initial German conceptualization in 2011, the technological environment and understanding of Industry 4.0 have evolved distinctly. At the same time, similar terms often used as synonyms, such as "smart manufacturing", "digital transformation" or "fourth industrial revolution" have increased the confusion about the extent and characteristics of this phenomenon (Culot et al., 2020). The current industrial revolution is driven by data, also referred to Industry 4.0.

Industry 4.0 has attracted significant attention from academia and industry professionals (Tiwari, 2020). The size of a company and the level of information system coverage are two factors affecting the level of acceptance of a company's technology (Zheng et al., 2021). The ongoing discussions on the „digital revolution – and – disruptive competitive advantages” have led to the creation of a business vision such as Industry 4.0. However, the timing, and its true impact on businesses is still unclear (Glas & Kleemann, 2016).

Strategies for Industry 4.0 should be refined and described in detail in order to develop economic and social systems that can respond flexibly to sudden changes in the system (Bag et al., 2018). Through populations, governments and businesses, countries have achieved varying degrees of current adoption of technologies. This level of acceptance affects the way each country deals with it and how it is affected by it.

In addition to knowledge and innovation, human capital is the most frequently mentioned factor that makes it possible to gain a market advantage in modern economies. This concept is defined as a derivative of education, acquired qualifications and practical skills. The currently observed dynamic development of advanced technologies requires the involvement of high quality human capital in this process. Human capital is a condition for the development of Industry 4.0 (Pilichowska, 2021).

The introduction of digital production technologies in Latin America faces diverse, heterogeneous, and decentralized conditions. After several years, there was no comprehensive view of the situation in the region (Scheeren et al., 2019). In Latin America, it is very important to start training professionals in the vision of Industry 4.0 (I4.0). Developed countries share a leading role in producing research in Industry 4.0, while Latin America and Asia are far behind. (technical competences) (Cardillo & Chacon, 2020).

Previous studies have not paid attention to comparing the two very few comparing economies compared to the emphasis on the need for digitization within Industry 4.0. The purpose of this paper is to compare the level of digitization and technical development of LA and Europe countries based on the correlation coefficient between CISCO and HDI countries from these regions.

This paper deals with the relationship between human development and the level of digitalization in the countries of the European Union and Latin America. The paper includes four parts. After a short introduction, the theoretical interface for the issue follows, focusing on the construction of the Index measure and its integration into the issue of Industry 4.0. Then the methodology and research methods follow. The results and discussion section compares the Correlation Coefficient between CISCO and the part of HDI for the countries of Latin America and the countries of the European Union. The fourth part – conclusions – summarizes the paper, includes implications for practice and defines research limitations and suggestions for the future research.

2 Literature Review

2.1 Indexes measure the adoption of Industry 4.0

For the research purpose the data from the Human Development Index by The United Nations Development Programme (Human Development Reports, 2019) and the Cisco Digital Readiness Index by Cisco Systems, Inc., both related to the 2019 as the latest available data have been used. (see figure 1)

Figure 1: Structure of Human Development Index



Sources: The United Nations Development Programme - Human Development Reports, (2019).

Accordingly to (The United Nations Development Programme - Human Development Reports, 2019), The Human Development

Index (HDI) represents a measure of achievement in important dimensions of human development in 189 countries and is aggregated into a composite index using geometric mean of normalized indices for each one of the three dimensions. These dimensions are as follow: a long and healthy life, being knowledgeable and have a decent standard of living. The health dimension is evaluated by life expectancy at birth, the education dimension is measured by mean of years of schooling for adults aged 25 years and more and expected years of schooling for children of school entering age. Moreover, the standard of living dimension is evaluated by gross national income (hereinafter GNI) per capita. The index uses income logarithm to reflect the diminishing importance of income with increasing GNI. In the present study, the indexes of Latin American and European countries were analysed.

The Cisco Digital Readiness Index (hereinafter CISCO) has been created by Cisco Systems, Incorporation to allow nations understand their own positioning and limits into taking an advantage of the benefits of digitization. A holistic view of digital readiness examined multiple factors indicating the progress that a nation has made towards digital maturity has been adopted. The digital readiness can demonstrate areas of strength while providing guidance as to how the nations can invest to improve their overall readiness (Cisco Digital Readiness Index, 2022).

This indicator takes values from 0-25 and has been compiled based on seven different components, which are intended to illustrate the digital readiness of the country. These components have been set as follows. The indicator, called Basic Needs, contains information on demographic data such as life expectancy, under-5 mortality and access to basic services, water and electricity. The Human Capital component contains information on the level of digital skills among human resources, including information on literacy rates, quality of education or average length of schooling. The Ease of Doing Business indicator includes factors such as the ease of business index, legal business standards and the Logistics Performance Index infrastructure rating. Building digital infrastructure and capabilities requires significant investment by government and the business community. Various sources of private and public investment are considered to measure these investments, including foreign direct investment, R&D expenditure, and investment freedom. These investments are included under the corporate and government investment indicator. The Start-Up Environment indicator includes information on the availability of investment and capital in each country to start a business. For the Technology Infrastructure indicator, information related to broadband and Internet access has been examined. The last component of the CISCO index is Technology Adoption, consists of examine data relating to mobile cellular penetration, internet usage, and cloud services and characterizes the general demand for digital products and services was assessed (Cisco Digital Readiness Index, 2022).

2.2 Adoption and adaptation to Industry 4.0

The technology development has changed not only the production process but also people's way of life (World Bank Group, 2016). Accordingly to a research from (Deloitte, 2018), most executives believe Industry 4.0 will lead to more social and economic equality and stability.

Accordingly to (Guryanova et al., 2019) resulted that the economic development in regions is established on the adoption of digital innovations. Additionally, (Semyachkov, 2019) has found that the transition to a digital economy, the introduction of digital technologies and the creation of effective business models has been prioritised from perspectives of socio-economic development for most developing countries (Latinobarómetro, 2018). Moreover the research of (Kristine Rozite et al., 2019) demonstrate that European Union broadband infrastructure, digital competences, use of internet, business technology integration and digital public services has delivered a significant positive effect on GDP growth.

Another important effect can be seen into dissimilarity of influences of technology utilization between developed and developing regions and between the continental regions which leads to the situation that the emerging countries have higher ICT divergence than developed countries (Rath, 2016; Pollak, 2020). Furthermore, Cortés & Navarro (2011) as well as Kubiela et al. (2014) and Ibujés Villacís et al. (2019) found that in European countries the different levels of economic development, productivity, and human development have been based on the level of ICT implementation as the fast broadband connections, social media, and mobile applications have created the digital transformation engine for Europe. The established European model enables the preservation of a sustainable industry, develop qualified employees, support energy transition and adapt to large-scale customization. Besides these findings, the analyse of the market capitalization value of the world's 70 largest digital platforms shows that Africa and Latin America's together share is only 1 percent, while the Europe's share have reached 4 percent (United Nations, 2019).

The digitization of production is still lagging in Latin America, which negatively affecting its productivity levels. Pratama and Al-Shaikh, (2012) have study digitalization and human development, concluding that the correlation between human development level and the internet penetration rate is positive and that the Internet penetration rate grows faster in the developed countries than in the developing countries. However, Miranda and Lima (2013) found that in countries with HDI less than or equal to 0,6 improvements in their operational ICT index are not linked to the corresponding improvements in the human development, whereas for countries with HDI greater than or equal to 0,75 can be found a close correlation between the two indices. The study of De La Hoz-Rosales et al., (2019) has evidenced that there is a positive impact of the individual use of ICT on human development, regardless of the country's level of development. Additionally, also the findings of (Jovanović et al., 2018), presenting that, for European countries, the higher level of digitalization tend to contribute to humanity and that the process of digitalization influences positively countries social components.

The lack of digital literacy is among the biggest barriers to connectivity, as ITC allows people to lead the life they want and allow them to expand their own capabilities. The literature sources consensus that it is important to invest in people's training and development, to be reached both advantages, the digital assets (e.g. hardware, software) and digital capabilities (e.g. managerial skills, strategy) to be able to use the digital technology as an competitive advantage (De La Hoz-Rosales et al., 2019).

3 Methodology

The indexes of Latin American and European countries have been analysed. The values used refer to the year 2019 because it is the most recent time horizon in which this indicator was calculated.

It is important to note that in this article the narrowest definition of Latin America was used, which includes the countries of the American Continent where Latin Languages are spoken. The analyses have been made between the countries of Latin America and Europe with data in both indexes HDI and CISCO. Thus, the countries analysed in Latin America were as follows: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela. The countries analysed in EU covered: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom. The countries' selection in each of the two regions fulfilled the criteria of the presence of values simultaneously in the Cisco Digital Readiness Index of 2019 and the Human Development Index of 2019. The data of

each region were analysed separately, in order to be able to identify the differences and similarities between them. The maximum value of HDI as a classic index is 1. The maximum value of the CISCO index is 25.

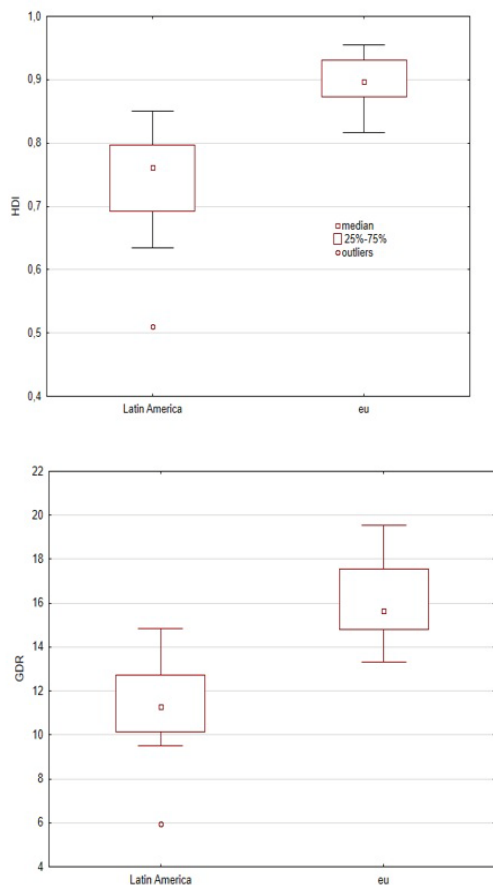
To detect discrepant countries concerning their region, the minimum and the maximum values of a box plot were calculated for each index and each region. Values that are smaller than the minimum value or higher than the maximum value are considered outliers. In the following step, the next data statistical analysis has been performed with the Statistica and Gretl. Using normality tests, it has been verified whether the data have a normal distribution, so the Pearson's correlation coefficient has been used to examine the dependence.

The correlation coefficients have been also measured between the CISCO index and each one of the indices that form the HDI index to identify the factors of greatest influence for the correlation. A multinomial regression based on the least-squares method has been performed for each region, after that, with HDI index as a dependent variable and as factors of CISCO index an independent variable. Then, the hypothesis tests have been performed to test whether the regression parameters were significant, and the p-values were analysed, indicating the smallest level of significance for the null hypothesis (non-significant parameters) to be rejected. Finally, the results were analysed according to the countries that are part of each region and their level of development to justify them.

4 Empirical results and discussion

The following figure (fig.1) shows the box of HDI and CISCO and each region, in which it is possible to analyse the inferior limits and the superior limits to find discrepant countries.

Figure 2: Box-plot HDI and CISCO



Sources: Author's own compilation.

Analysing the graphs in Figure 2 shows that in Latin America, one country is identified as an outlier. This country in both cases is Haiti.

Regarding the CISCO and HDI indexes, the European mean is higher than Latin America mean and Europe has higher maximum and minimum values, which indicates that in general the countries of the European continent have reached a higher degree of adoption of digitization. In addition, Latin America's standard deviation is bigger than the European's one, indicating greater variability, which can be interpreted as higher inequality about the adoption of digitization. Analysing the skewness (tab.1), it is notable that the values of HDI are less than zero on both regions, showing that the left tail of the probability density function is higher, with a higher concentration of values below the average. For the CISCO indicator, the skewness value differs for both regions. In the case of the buckling coefficient, both regions differ in both indicators. For the Latin America region, we get a result in which the sharpness is positive and is therefore above normal, and the values of the indicators are therefore much more similar for individual countries than for EU countries, where the sharpness is below normal.

Table 1: Descriptive characteristics

Variable	HDI	CISCO	HDI	CISCO
Location	Latin America	Latin America	EU	EU
Average	0,741	11,425	0,898	16,036
Minimum	0,51	5,96	0,816	13,34
Maximum	0,851	14,86	0,955	19,54
Standard deviation	0,082	1,987	0,037	1,755
Skew	-1,16	-0,834	-0,383	0,387
Kurtosis	1,86	2,044	-0,504	-0,93

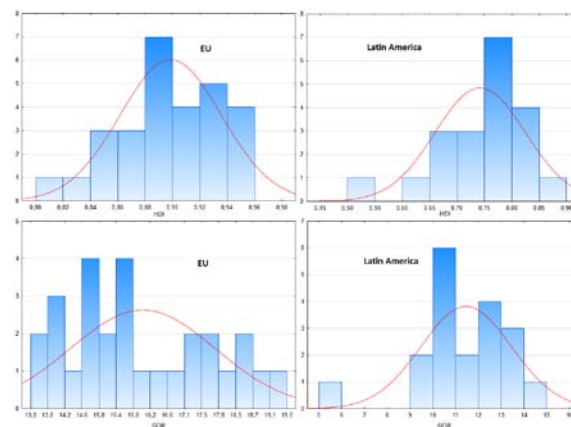
Sources: Author's own compilation.

Regarding the HDI, the European mean is higher than Latin America mean, with higher maximum and minimum values, indicating that, in general, the countries of the European continent have a higher human development index. In addition, Latin America's standard deviation is greater than the European's one, indicating greater variability, which can be interpreted as higher social inequality between countries.

Data from both countries were subjected to normality testing using the Kolmogorov-Smirnov Test. The correlation between HDI and CISCO for both regions were p-value > 0.05 and therefore the hypothesis of normality of the data cannot be rejected. (see figure 3)

The following figures show the data histograms.

Figure 3: Histograms HDI and CISCO



Sources: authors' own elaboration

The correlation coefficients between the CISCO and the HDI analysis indicates that there is a greater correlation in the European continent than in Latin America, but both have a strong positive correlation (p-value of test is smaller than 0,05) since they have coefficients greater than 0.8. The following table shows the Pearson correlation coefficient values.

Table 2: Correlation Coefficient

	Correlation coefficient
Latin America	0,938
Europe	0,845

Sources: Author's own compilation.

In addition, it is feasible to analyse the correlation between the part of CISCO and HDI. The correlation coefficients for each region can be found into following tables (tables 3 and 4).

Table 3: Correlation Coefficient between CISCO and part of HDI

	Latin America	Europe
Basic Needs	0,861	0,757
Business and Gov't Investment	0,325	0,817
Ease of Doing Business	0,676	0,877
Human Capital	0,891	0,699
Start-up Envir	0,628	0,323
Tech Adoption	0,921	0,795
Tech Infrastructure	0,861	0,724

Author's own compilation.

Pearson correlation coefficient values from tab. 3 have been tested. In all cases, the null hypothesis has been rejected. In the case of Latin American countries, can be seen that the relationship is significantly stronger than in the EU, apart from GNI and CISCO.

Table 4: Correlation Coefficient between HDI and parts of CISCO

	Latin America	Europe
Life Expectancy at Birth	0,93	0,576
Mean of Years of Schooling for Adults Aged 25 Years and More	0,819	0,488
Expected Years of Schooling for Children of School Entering Age	0,647	0,459
GNI per capita	0,862	0,892

Sources: Author's own compilation.

The independence testing has shown that Table XX shows a p-value greater than 5% for Business and Government and CISCO in LA and Start-up and CISCO in the EU. It is important to note that, to compose the GNI index, the HDI uses income logarithm to reflect the diminishing importance of income with increasing GNI. Also, the education index consists of "Mean of Years of Schooling for Adults Aged 25 Years and More" and "Expected Years of Schooling for Children of School Entering Age". Lastly, the multinomial regressions were calculated (HDI as a dependent variable and part of CISCO as an independent variable).

The summarized results are in the following table 5.

Table 5: Regression analysis – OLS for HDI

Latin America			
	coefficient	t	p-value
Const	0,268	6,02	<0,001
Ease of Doing Bussiness	0,035	2,099	0,053
Human Capital	0,105	4,569	<0,001
Tech Adoption	0,138	3,665	0,002

Europe			
	coefficient	t	p-value
Const	-0,158	-1,314	0,201
Basic Needs	0,193	6,245	<0,001
Human Capital	0,083	5,796	<0,001
Tech Adoption	0,041	2,619	0,015

Sources: Author's own compilation.

The coefficient of determination shows that more than 85 % of variability HDI in both regions has been explained.

The step wise regression has been used for the modelling and a model with three explanatory variables has been obtained for both regions. All assumptions (heteroscedasticity, multicollinearity, specifications, and normality) have been met and the models are therefore plausible. The explanatory variables Human Capital and Tech Adoption have been identified as statistically significant parameters for both regions. The increase in the value of the Human Capital indicator, which contains information on education, has been reflected in the HDI more than the increase in the Tech Adoption indicator in the case of EU countries. In contrast, in the Latin American region, Tech Adoption has a greater impact on the change in HDI than the change in education described in Human Capital.

In contrast, in the Latin American region, Tech Adoption has shown a greater impact on the change in HDI than the change in education described in Human Capital. The indicator with the greatest impact on the HDI has been identified the indicator of Basic Needs in the countries of the European Union. This relationship may be due to the demographic structure of the countries of the European Union. From a demographic point of view, Europe is facing problems with a low natality index, leading to an aging population that is increasing life expectancy. At the same time, the technical knowledge of school graduates is being increased. In the case of Latin American countries, such significant changes in the structure of the population have not been apparent and the relationship between the Human Development Index and Basic Needs therefore have not been so high. In the regression model, this indicator has been identified as statistically insignificant. In Latin American countries, the HDI has been further found to be depending on the ease of business factor named The Ease of Doing Business indicator. The economic situation in the regions of Europe and Latin American are significantly different and this situation has been reflected in this indicator.

4.1 Summary of findings

According to The United Nations Development Programme - Human Development Reports (2019). HDI has been classified as Low, Medium, High and Very High. The following table shows the number of countries in each classification among those analysed, as well as the percentage in relation to the total.

Table 6: Human Development Classification Level

	Latin America		Europe	
	Number of countries	%	Number of countries	%
Low	1	5	0	0
Medium	6	29	0	0
High	11	52	4	14
Very High	3	14	24	86

Sources: Author's own compilation.

While 86% of the European countries analysed have reached the very high HDI, only 14% of Latin American countries have reached this level. In addition, all the European countries analysed have been outreached their HDI rated as high or very high, while 34% of Latin American countries have been spread below that rating. The information provided in the table is consistent with the statistical summary, since, in general, European countries are better classified. The fact that Haiti is the only country among the selected countries classified as Low is

following the analysis made previously, in which it was considered an outlier. Besides that, the correlation coefficients show that HDI has a strong positive correlation with CISCO, which agrees with the Human Development Report (The United Nations Development Programme, 2019) as it indicates that higher levels of human development keep up with greater access to technology.

The largest standard deviation of the CISCO among Latin American countries seems to be consistent with Katz and Callorda (2018), who studied that Latin America and the Caribbean contain countries with substantially different digital ecosystems, which is in accordance with economic development differences. Regarding the CISCO standard deviation, can also be possible to relate inequality in Latin America as a historical consequence of the colonial period.

The important fact stated, is that the rate of perception of justice in the distribution of wealth in Latin America fell from 16% in 2018 to 12% in 2020 (Latinobarómetro, 2022). Additionally, Latin America DAI index prove its strongest correlation with the GNI per capita, representing that the gross income become a relevant factor for the digitalization. According to The United Nations Development Programme (2019) the Latin American countries have belonged to the developing economies.

Despite the average adoption of digitization being higher in Europe than in Latin America, has been Employers should satisfy their employees with new career opportunities (Nangoy et al., 2020). Too many of young people still leave education without having the necessary preparation to enter the labour market (Frey & Osborne, 2017). Thus, it is necessary to improve the quality and relevance of skills formation and improve skills and information for better career choices (McKinsey Global Institute, 2017). Another relevant factor for Europe, is the replacement of jobs as the gap between demand and supply of ICT educated specialists has been expected to increase. Furthermore the lower the level of education required, the more likely the job is to be automated (Nangoy et al., 2020).

However, while some jobs will be lost, others will be generated. The level of cooperation between humans and machines will increase significantly (Muscio & Ciffolilli, 2020). Although it requires difficult transitions and investments, the increased demand for new roles will compensate for the decreasing demand for others (Lass & Gronau, 2020). Moreover, the greater productivity and competitiveness generated by technology will increase the demand of labour (Kadir and Broberg, 2020, Habanik et al., 2019). Thus, it is necessary to create an environment supporting education, requalification and know how sharing, so that the negative effects of digitalization are suppressed by the positive impacts. The resulting changes are estimated to affect both, the total performance of work systems, and the well-being of people who work in and interact with work systems (Kadir & Broberg, 2020). Governments, companies and educational institutions can enable the higher qualification of workers alongside with the expansion of internet and other technological and communication tools access. In addition to rapid and often uncertain advances in technology, there is a long-term and predictable trend of aging populations and labour force worldwide. Current trends in life extension, together with rapid technological innovation, will change significantly the way we will work in the future, posing challenges for governments, enterprises and individuals (Changing Demographics and Ageing Workforces — Future of Work Hub, 2022). The human development and digital adoption within the society can be achieved through a careful mix of market competition, public-private partnerships and effective regulation of the internet and telecommunications sector. (Grencikova et al., 2019)

5 Conclusion

The countries of Europe and Latin America regions prove significant differences in terms of human development and digital adoption. However, in both regions has been evidenced a strong positive correlation between HDI and CISCO, indicating

that countries with higher HDI also prove higher CISCO and vice versa. In addition, Latin America region only has been reported the outliers. The correlation seems to be stronger on the Latin America, which prove less variability in the data, indicating less inequality. The stepwise regression has been used in the construction and verification of the regression model and it has been proved that in the selected regions the most important component influencing the HDI is the education of the population likewise the possibility of adapting new technological procedures.

The benefits of work for (not only) managerial practice are relevant to selected countries of the European Union and Latin America, especially for the management of multinational companies and government agencies. The results of the work point to the differences in the evaluation of countries for the fourth industrial revolution, and thus also to the readiness of individual countries for the ongoing changes.

A certain limitation of research can be seen in the scope and focus of both indices, especially their individual components. The absence of an analysis of the environment, which determines the components of both indices in individual countries, especially the challenges directly related to the Fourth Industrial Revolution and its effects on society and the economy, may also appear to be a limiting research. However, supplementing the analyses would significantly expand the limited scope of the article.

Continuation of research

Due to the research findings, authors state that income has been proven as an important influencing factor on digitalization in both regions. The further research focused on the relations of income can be beneficial to recognize the sphere of human development and digital adoption.

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MUSICAL PORTRAIT OF DORIAN GRAY IN OPERA BY LUBICA ČEKOVSKÁ

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Abstract: The present study is primarily concerned with identifying the means of characterisation of the characters in the Dorian Gray opera by composer Lúbia Čekovská and librettist Kate Pullinger. The first part of the study introduces the literary source of the Dorian Gray opera - the novel *The Picture of Dorian Gray* by an Irish writer Oscar Wilde. It interprets the results of a comparison between the libretto of Dorian Gray and its literary source. The second part of the study is devoted to the characterization of the musical language and characters of the Dorian Gray opera. Ultimately, the study interprets the opera's focal theme - The Voices of the Painting.

Keywords: Dorian Gray, Lúbia Čekovská, opera

1 Introduction

The ever-present question of the beauty of the human body and its confrontation with the spiritual depravity of man is the theme of the book *The Picture of Dorian Gray*. The timeless and familiar story targets the innermost human anxieties and deepest desires at the same time. The original work by the decadent¹ Irish poet and Victorian-era writer Oscar Wilde is a bleak novel about human vanity and the destruction of the human soul. One of the underlying themes of the work is the obsession with youth and beauty and the consequent fear of their gradual loss. It deals with the contradiction between the enjoyment of beauty and morality. The literary work *The Picture of Dorian Gray* contains philosophical and aesthetic reflections on the power of art, which can uplift its author and recipient, but can also devastate them.² This variation of the Faustian legend³ caused a scandal at the time of its publication and was condemned for elements of hedonism.⁴

On 8 and 9 November 2013, the Slovak National Theatre premiered an opera by Slovak composer Lúbia Čekovská. *The Picture of Dorian Gray* appealed to her so much that she decided to treat the controversial topic as a musical drama.

2 Opera Dorian Gray

Dorian Gray, adapted by Slovak composer Lúbia Čekovská and librettist Kate Pullinger, is an opera in three acts, divided into sixteen scenes, written in English. The story, dealing with questions of the physical and spiritual forms of beauty and evil, is based on the duality of the interior and exterior, discussing the desire for eternal youth and beauty, the destruction of the human soul, vanity and greed. It draws inspiration from Oscar Wilde's novel *The Picture of Dorian Gray*. The hints of homosexuality and the "Faustian" selling out of the soul of the main character, longing for eternal beauty and youth, can be described as provocative positions, which largely depart from the traditional themes of Slovak opera.

The world premiere of Dorian Gray opera took place on 8 and 9 November 2013 in the historic building of the Slovak National Theatre in Bratislava as part of the international festival of

contemporary music *World New Music Days 2013* and the *Melos-Étos* festival. The production key of *Dorian Gray* was originally to be created by the well-known English director David Pountney, but he was unable to accept the offer due to work reasons. The work was finally staged by his wife Nicola Raab, who can be classified as a representative of the younger generation of internationally established opera creators. The musical direction was provided by Christopher Ward, an English conductor with a positive attitude towards contemporary music. The set and costumes for the opera production were designed by costume and set designers Alexandra Burgstaller and Anna Marie Legenstein. The composer originally wished for the character of Dorian Gray to be played by Slovak tenor Pavol Bršlík. However, due to his workload, he did not accept the offer and the main character was eventually played by an American tenor Eric Fennel and an Irish tenor Eamonn Mulhall.⁵

3 The musical language of opera

The Slovak National Theatre performs original Slovak operas only sporadically. This opera has therefore aroused all the more expectations. Fifteen reviewers from renowned national and international print and electronic media attended the two premiere performances of *Dorian Gray*.⁶ The work has attracted the interest of critics and publicists working with *The New York Times*, *Opera New London*, *Opernwelt*, *SITA* and many other well-known media outlets.⁷ After the premiere, the opera was also reviewed by the well-known reviewer Friedrich Reininghaus. According to him „...after a long time, Bratislava has been enriched by the work of a young artist who is composer-in-residence for a major German publishing house.“⁸

Although the process of rewriting the libretto caused the loss of some of the philosophical level of the original novel and a considerable part is saturated by the music. The musical component is built on contrasts of the simple and the complex, the beautiful and the decadent, the tonal and the atonal. The musical material of *Dorian Gray* opera is built monothematically; its basic characteristic is its variability - one can find several related musical themes in the score, with which the author works in different musical variations. The musical development of *Dorian Gray* moves from the conventional opening act to a more harmonically and rhythmically adventurous character and contrast. Within the first act, the composer employs clear orchestral scoring - long rhythmic values of consonant harmonies which, in their simplicity, may evoke in the listener an atmosphere of "aestheticism"; - an over-focus on external beauty, which gave rise to the portrait of Dorian. In the second and third acts, the music becomes more "active"; the composer employing more dissonance. The sonically sharpened dissonant intervals, the dark instrumentation of the orchestra, and the dark to aggressive vocal delivery of the protagonist, taking place in a variety of dynamic levels and expressions, are the main characteristics for the opera's finale. A prominent part of the compositional language, appearing throughout the opera, are the long, dense chordal harmonies of the upper third. George Loomis noted in *The New York Times* that „...Čekovská's style is lucid, gently dissonant, with lyrically profiled vocal lines highlighting the restless nature of Oscar Wilde's fictional work.“⁹

Given the scope of the work, we will list the most interesting musical moments of *Dorian Gray* opera. In terms of instrumentation, the opera is a chamber-like work; the instrumentation is organic and balanced. In some places the instrumentation lets the sung words ring out. At other times it is

¹ Decadence comes from the French word *décadence* - decline. It is an artistic movement from the turn of the 19th and 20th centuries. It finds its predilection in depicting or expressing moods of sadness, pessimism, scepticism, boredom, vanity and even contempt for life. It also exposes the most taboo topics, such as homosexuality or Satanism.

² MOJŽISOVÁ, Michaela: *Vyliečiť dušu vďaka svojím zmyslom a vďaka duši vyliečiť si zmysly*. [Online.] 2013, [cit. 2022-09-08]. Available on: <https://www.monoringdivadiel.sk/recenzie/recenzia/vyliecit-dusu-vdaka-svojimzmyslom-a-vdaka-dusi-vyliecit-si-zmysly/>

³ The story of Doctor Faustus and his pact with the devil has been one of the most frequently treated themes in European literature since the 16th century. The prototype for the character of Doctor Faustus was Johann Georg Faust (1480-1540), a wandering alchemist who was rumoured to have conspired with the devil during his lifetime.

⁴ Hedonism is a philosophical trend and ethical doctrine according to which the good things in life come from anything that gives people pleasure or relieves them of suffering.

⁵ VONGREJ, Ludovít: *Lubica Čekovská: Dorian Gray je moja srdcová záležitosť*. [Online.] Portál Opera Slovakia 2013, [cit. 2017-11-18]. Available on: <https://operaslovakia.sk/lubica-cekovska-dorian-gray-je-moja-srdcova-zalezitost>

⁶ EDITORI WEBNOVÍN: *Opera Dorian Gray od Lubice Čekovskej zaujala aj svet*. [Online.] 2013, [cit. 2017-11-18]. Available on: <https://www.webnoviny.sk/opera-dorian-gray-od-lubice-cekovskej-zaujala-aj-svet>

⁷ EDITORI WEBNOVÍN, c. d., 2013.

⁸ EDITORI WEBNOVÍN, c. d., 2013.

⁹ EDITORI WEBNOVÍN, c. d., 2013.

dramatically tense - it is rich in sound and colour, drawing the listener into the atmosphere of particular dramatic situations. Vocally, the opera is built on arias, duets, tercets and ensemble numbers. These are not numbered arias in the tradition of early opera, but rather recomposed sections with rich vocal variation. The tonal range of the vocal parts of the individual characters is within the natural range of the given voice fields. As Ľubica Čekovská stated in an interview for the magazine *Hudobný život*: „... I tried very hard to make the opera interpretable. I sang the vocal parts myself; I also consulted them with my husband Svejo. He gave me valuable advice about transitional tones and other specifics of the different voice fields.”¹⁰

However, the constant ending of vocal phrases on a high note can have a stereotypical effect on the listener. Interestingly, the individual vocal parts of the characters are often composed without orchestral accompaniment.

In terms of tectonic construction, the opera has an overcomposed structure. Instrumental intermezzi and two separate musical numbers, namely *Circus atonal* and *Dance of the Turkish Boy*, can also be found in the opera. These musical numbers, however, differ in their musical language from that of the opera; the author uses them as a signal of entry into the “low-budget” London theatre in which Sibyl Vane performs. Initially clear harmony and melody gradually graduate to clusters, glissandos and unnatural positions of individual instruments.

The English conductor Christopher Ward considers Ľubica Čekovská’s musical language to be varied, very demanding, dramatic, and highly stylized.¹¹ Pavol Smolík states that „... the composer makes rich use of symbolic statements and plot shortcuts, which resonate more and more in the gradually revealing message of the work - so that they keep the viewer’s attention.”¹² In this sense, there are a number of interesting, often recurring moments in the score. One such moment, for example, is the ostinato, which the composer explains in terms of symbolism as follows: „*Ostinato is a metaphor for the anger that - precisely and persistently dosed - burrows under our skin until we accept it as truth. What’s more, the work operates like a metronome counting down time.*”¹³ Just as often one can find the interval $d - g$, which can be understood as a cryptogram of the title character’s name.¹⁴ Slovak critic Robert Bayer, in his article “*When Men Make Love, Women Are Helpless*” in the magazine *Hudobný život*, argues that „...Čekovská’s composition, together with the conservatively retold libretto, is a dense, compact and superbly crafted contribution to contemporary music-drama writing.”

4 Musico-psychological characterisation of Dorian Gray

The character of Dorian Gray as a dramatic operatic figure is essentially no different from his fictional antecedent. Therefore, we will now focus mainly on the musical characteristics of this hero.

As far as the vocal classification of Dorian Gray is concerned, the author has chosen tenor. This character is the most challenging character of the opera in terms of his vocal part. He does not leave the stage for almost the entire duration of the opera (about 2,5 hours). His vocal part is written in the range from e^1 to his^2 . The demanding nature of this part is confirmed by the fact that it is mostly on the notes from e^2 to his^2 . Thus, the performer hardly rests in the lower positions. His vocal part contains a varied range of presentational characteristics (*dolce*, *deliatio*, *apenato*, *mestamente*, *tremendo*, *furioso*, *expressivo*

etc.). The ideal representative of Dorian Gray is the lyric-dramatic tenor.¹⁵

The first appearance of Dorian Gray takes place in the very first act and the very first scene. Musically, his arrival is handled as follows: when Dorian arrives, a short musical section is played, which may remind the listener of a fanfare (woodwind and brass instruments). Dynamics and rhythm are a prominent element here. This part can be understood as follows: a fanfare is a short musical piece that is most often played at important ceremonies. Fanfares are also heard when welcoming a distinguished visitor. In this case, the distinguished visitor is Dorian. The composer has thus enhanced the atmosphere of Dorian’s arrival by using such a “fanfare”, which suggests to the listener from the beginning that Dorian is a personality who, over the course of the action, will acquire a great influence on the people around him.

Sheet music example 1: Music reminiscent of a fanfare¹⁶

Dorian comes across as a young man full of energy and good humour. He enters the studio, heads straight for the piano, while ignoring the painting. He announces to Basil that he longs to play the piano and no one will stop him. Dorian’s opening words are: „*I am going to play the piano. I am longing to play the piano today. Basil, you can’t stop me - I am playing the piano today!*”¹⁷ Dorian’s entrance is energetic. This part is quite vocal at this point, its dreamy melody, coupled with an accompaniment dominated by the clear sound of celesta and vibraphone, has an almost fairy-tale quality.

Then comes the contrast. Basil introduces Dorian to Lord Henry. It is clear that Dorian is impressed by his meeting with Henry, sparks fly immediately between them. While Dorian poses for Basil the painter, Lord Henry philosophizes about life. Dorian listens to him intently with wonder and admiration.

The music begins to take on a different character as soon as Dorian becomes acquainted with Lord Henry - for example, for the first time, a cluster is heard, which brings unease to the musical flow. From this point until Dorian expresses his longing for eternal youth and the beauty for which he will give his soul, the music is sometimes too simple - the vocal parts are even without orchestral accompaniment to better bring out the urgency of their content.

¹⁰ MOJŽISOVÁ, Michaela: *Ľubica Čekovská: Pred operou som mala veľký rešpekt*. In: *Hudobný život*, 2013, Vol. 45, No. 12., p. 27 – 28.

¹¹ MOJŽISOVÁ, c. d., 2013, p. 28.

¹² SMOLÍK, Pavol: *Ľubica Čekovská: Dorian Gray*. In: *Impulz. Revue pre modernú katolícku kultúru*. Vol. 9, 2013, iss. 3 – 4. [Online.] [Cit. 2020-03-04.] Available on: <http://www.impulzrevue.sk/article.php?1075>

¹³ MOJŽISOVÁ, c. d., 2013, p. 28.

¹⁴ MOJŽISOVÁ, c. d., 2013, p. 27.

¹⁵ Miriam Žiarna in her publication *Theory of Voice Education* (Ružomberok: Verbum, 2015, p. 105) characterises the tenor as a high male voice. (1) lyric ($c - d^2$) – it has a bright light colour and light high notes, it is also very mobile. (2) Lyric-dramatic, spinto ($H - h^2$) – she defines this type as a colourful voice with metallic highs. (3) Heroic, ($H - c^3$) – is characterized by a wide midrange, full voicing with dark to baritone coloration, and intense high notes. (4) Comic, buffo – ($c - a^2$) – has the smallest vocal range of all tenors, is slightly colored, and lighter. It is also very mobile and utilized in comic operas.

¹⁶ ČEKOVSKÁ, Ľubica: *Dorian Gray*. [Score.] Basel: Bärenreiter Verlag, 2012, p. 62.

¹⁷ PULLINGER, Kate. *Dorian Gray. Libretto*. In: JAKUBEK, Slavomír a kol.: *Bulletin k inscenácii Dorian Gray*. Bratislava: DOLIS s. r. o. 2013, p. 15.



Sheet music example 2: Dorian's vocal parts without orchestral accompaniment¹⁸

At other times the music is dark again – dramatically tense, dissonant and melancholic. This can be seen as an effort by the composer to create a mysterious atmosphere, in the same way that Dorian is mysterious and unreadable. At the moment when Dorian offers his soul for eternal youth and beauty, *The Voices of the Portrait* echo, yet in their original, "pure" version.

The music ceases to be "mysterious" when Dorian learns of the suicide of his fiancée Sibyl Vane. From this moment on, Dorian Gray's vocal part becomes melancholic and is accompanied by dissonant harmony - in a deep position one can notice the ostinato repetition of the tone, which may evoke in the listener the aforementioned "metronome of time".



Sheet music example 3: Ostinato repeat of a note¹⁹

Dorian's vocal part repeatedly ends on a high note, which may evoke screams in the listener, caused by despair and hopelessness.

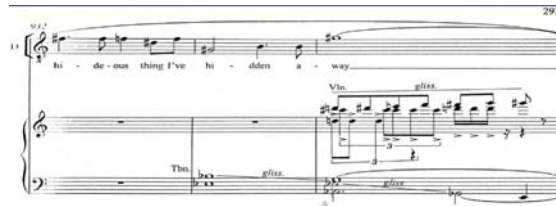
Dorian Gray's most dramatically tense performance takes place in scene 15, after the death of Alan Campbell. Dorian begins to realize his sins. He seems to genuinely regret them.

Dorian longs to start a new life. For the first time, he voices aloud that the painting is his conscience. It reflects in him every sin, every wrong he has done in his life. Full of determination, he decides to act. He is certain of what he must do – destroy his devastated portrait. He hopes that this will purify his soul, and even his words imply that he is willing to undergo public humiliation and shame. Čekovská has handled the moment of realization of sins, the desire for a new life and the subsequent death of Dorian in a thrilling way. From the moment when Dorian expresses that he wants to start a new life to the moment when he says of the painting, „Why have I kept it? I must destroy it”²⁰, Dorian is accompanied only by the sound of the vibraphone and the harp (in some places the trills of the harp, elsewhere the repeating interval *e – dis2*). These instruments are particularly characteristic of the character of Sibyl in the opera. It can thus be understood as the author's intention to emphasize that the remorse of Sibyl's death haunts and torments him.



Sheet music example 4: Harp accompaniment²¹

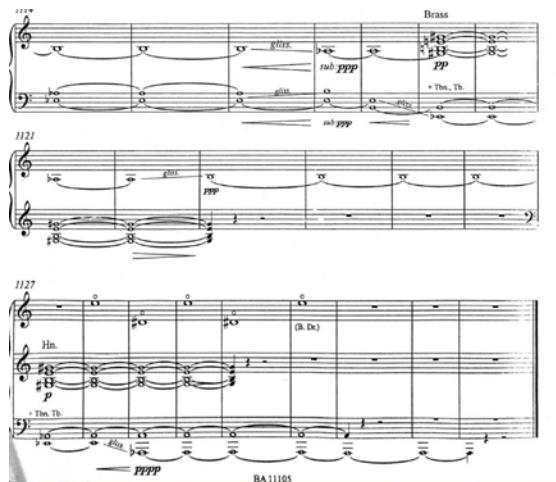
In places where the harp and vibraphone do not sound, the glissandos of the trombones do. At moments when Dorian sings a long note, the glissandos of the cellos appear throughout the bar.



Sheet music example 5: Trombone and cello glissandos²²

It is the glissandos of the trombone and cellos that can have an almost demonic effect on the listener. Elsewhere, by contrast, Dorian's vocal parts are without orchestral accompaniment. This can be seen as the author's intention to emphasize that Dorian is truly alone at this point and experiencing great fear. The instrumentation begins to become sonically fuller from the utterance of Dorian's words „Why have I kept it? I must destroy it.”²³ At that point, the composer begins to use dense, dissonant chords of a higher third structure. Dorian's last words are „... and then I will be at peace.”²⁴ Dorian looks around the room and sees the knife with which he killed Basil. He stabs the painting. However, it is Dorian who screams and dies in agony.

In the final symphonic epilogue, the composer has used chords of higher thirds in the orchestra's tutti cast. Nevertheless, she only operates in *piano* (also *pp*, *ppp*, *pppp*). This may have its own symbolism: through such a moment, when the music reverberates in the piano, Čekovská leaves an open space for her audience to wonder whether the protagonist deserves “absolution”.



Sheet music Example 6: The final bars of the symphonic epilogue²⁵

5 The Voices of the Portrait - Dorian Gray's leitmotif

What characterises Dorian Gray most is the reflection of his conscience, the so-called leitmotif and the central theme of the whole opera – *Voices of the Portrait* – which Ľubica Čekovská „... contributed to the modern shape of the production with an absolutely ingenious trick, namely the musical rendering of the *p* of Dorian, which she created by using boys' soprano voices.”²⁶ The theme shines through in the moments of the protagonist's confrontation with his portrait. As the protagonist's destruction progresses, the initially pure line takes on demonic forms of Dorian's sin-riddled soul.

¹⁸ ČEKOVSÁ, c. d., 2012, s. 274.

¹⁹ PULLINGER, Kate. *Dorian Gray. Libretto*. In: JAKUBEK, Slavomír a kol.: *Bulletin k inscenácii Dorian Gray*. Bratislava: DOLIS s. r. o. 2013, p. 16.

²⁰ PULLINGER, Kate. *Dorian Gray. Libretto*. In: JAKUBEK, Slavomír a kol.: *Bulletin k inscenácii Dorian Gray*. Bratislava: DOLIS s. r. o. 2013, p. 17.

²¹ ČEKOVSÁ, c. d., 2012, s. 314.

²² VONGREJ, Ľudovít: Svetová premiéra opery Dorian Gray Ľubice Čekovskej na javisku opery SND. [Online.] Portál Opera Slovakia, 2013, [cit. 2017-11-15] [Online.] Available on: <https://operaslovakia.sk/svetova-premiera-opery-dorian-gray-lubice-cekovskej-na-javisku-opery-snd/>

¹⁸ ČEKOVSÁ, c. d., 2012, p. 84.

¹⁹ ČEKOVSÁ, c. d., 2012, p. 91.

²⁰ PULLINGER, Kate. *Dorian Gray. Libretto*. In: JAKUBEK, Slavomír a kol.: *Bulletin k inscenácii Dorian Gray*. Bratislava: DOLIS s. r. o. 2013, p. 16.

²¹ ČEKOVSÁ, c. d., 2012, p. 256.

The theme does not sound during the opera as performed by the orchestra but is played from the score. Its original form was sung and recorded by the Bratislava Boys Choir. Variations of the theme were created electroacoustically in a studio in Paris. The theme was arranged into individual musical variations by Robert Rudolf, a personality of Slovak electroacoustic music and radio art. Robert Rudolf together with Lubica Čekovská conducted detailed interviews prior to the actual work on the individual musical variations of the theme of *The Voices of the Portrait*. During these conversations, Čekovská's specific idea gradually crystallized, which was „... several sound preludes with the same theme and a gradual departure from their original form.”²⁷

„From the very beginning I wanted the image to be mainly audible, so the Bratislava Boys Choir recorded a kind of voice for the portrait, which I later had modulated in an electroacoustic studio in Paris,”²⁸ said Čekovská. According to the words of Robert Rudolf, the artist's idea was not quite precisely defined at first. However, the composer refined her idea quite quickly and presented it in final notated form, along with sound recordings of the soloist and the boys' choir.

There were several complications during the recording of the boys' choir. The soloist started to mutate during the recording. Therefore, the authors had to resort to alternative solutions, such as attempting to replace the soloist and at the same time attempting to change the recording method. Rudolf states that „... the two sound files are independent of each other, and their length is edited, so they do not exactly correspond to the original notation.” This implies that soloist and chorus were not recorded simultaneously. When comparing the notation of the theme and its final version, we find differences in the ratio of note lengths, i.e. in the rhythm.

When the recordings came into Robert Rudolf's hands, he stated that many more edits had to be made in order to ensure that they were of acceptable musical and technical quality. Rudolf said that it was necessary to correct the intonation of some places in the solo part as well as in the choral accompaniment. After presenting the results, the composer's choice fell on the specifically arranged solo of the boy soprano and the accompanying chorus as the basic sound material from which the musical variations, of the theme were derived.

In the literary premise, with each of Dorian's sins, a "blot" appears on the painting. The painting thus gradually begins to "rot" and becomes increasingly ugly. The musical theme *The Voices of the Portrait* symbolizes the metaphor of the image. On stage, each one of Dorian's sins is reflected in the wording of the theme. With each sin, *The Voices of the Portrait* take on a more complicated form, culminating in the demonic wording.

The original theme consists of a 15-bar melody by the soloist of the boys' choir, complemented by the harmonic accompaniment of the other voices. The main melody is sung by the soprano written in the upper staff, the harmony voices in the lower staff are presented by the alto, under which the pure quartet is heard in the voice of the lower alto. In the last musical section of the theme, a four-part voice is heard. Formally, the theme can be divided into three musical sections: the first musical section presents the first six bars of the theme, the second musical section presents the next four bars, and the third musical section presents the last five bars. The first six bars of the theme are prescribed to be sung in piano. The main melody moves on the notes *cis*, *dis* and *eis*. A ligature is written on this section, indicating a melodic arc through the first five bars. The sixth bar merely reverberates in harmony. In the next four bars, the melody moves up a third and the dynamics graduate from mezzoforte to forte. The third musical section can be called the coda of the theme, and this is because the theme reverberates in it. The main theme of the hero of the opera is directed towards the central note of *cis*. In the coda, the last note of the melody is

a second of *es* to the prime of *cis*. This produces the following chord: in the lower alto *gis*, the alto *cis*, the lower soprano *cis*, and the melodic soprano voice dissonates with them with a second of *es* (*dis*). Dissonance also appears in the third line in the second bar as a dissonant consonance with the *g-d-es-c* and the soprano's *es*.

Sheet music Example 7: The Voices of the Portrait²⁹

The development of *The Voices of the Portrait* theme is supported by dynamics. A vocal, clean and clear melody is heard in the piano, with consonant accompaniment from the lower voices in the first ten bars. Below the lower octave in the alto, a pure quart is heard – a consonant, plaintive interval, as pure and innocent as Dorian was at the beginning – a young aristocrat, a boy with a pure and innocent soul. The dynamic marking *piano* at this point may represent his inexperience and initial timidity. Then comes a sharply dissonant consonance in bar eleven, with the dynamic marking *sforzato* (accent, large accent), which may indicate the sharp character change Dorian is undergoing. Just as when a chord suddenly takes on a sharp dissonance from a plainchant sound, Dorian undergoes a character change very quickly and sharply. And that's only because he meets Lord Henry, who changes Dorian's entire mindset in a short period of time. Dorian started going to parties, hurting people, being mean to them, he even started murdering. Therefore, the dynamic label *sforzato* has its justification – a pure soul became a monster in a short while. In the coda of the theme, although consonance is first restored, the main melody ends dissonantly. One can look for symbolism in such a "detuning": Dorian has indeed purified the painting by realizing his sins and wanting to make amends by destroying the painting – hence the initial consonance in the last section. Dorian, however, dies ugly, old and repulsive.

The first musical variation is heard in Act One, Scene Five, when Sibyl, as a result of her unrequited love for Dorian, drinks poison and dies. Thus, the first 'stain' appears on Dorian's image – in the operatic case, within the theme of *The Voices of the Portrait*. In the first variation, Robert Rudolf worked exclusively with the solo voice, which underwent a "delay (*PitchAcc*) effect, different for each stereo channel and with the pitch of the sung note unchanged".³⁰ This means that the main melody is punctuated by imitations of the notes, which come on with different delays. The melody "wanders" in counterpoint to the original melodic voice and its "echoes". In the tangle of voices, the role of the chorus as a landmark is somewhat more prominent than in the original theme.³¹ Robert Rudolf's aim was to create voices mutating the purity of Dorian Gray's thoughts and soul as the seductive voice of the "Erinyes",³² which, however, do not yet have too much influence on the main character.

²⁷ RUDOLF, Robert: Communication per e-mail. [2020-03-30].

²⁸ URSÍNYOVÁ, Terézia: *O dualizme ľudskej prirodzenosti. Portál Opera Slovakia*. [Online.] 2013. [Cit. 2017-11-15.] Available on: <https://operaslovakia.sk/dorian-gray-odualizme-ludskej-prirodzenosti/>

²⁹ ČEKOVSKÁ, c. d., 2012, s. 5.

³⁰ RUDOLF, c. d., 2020.

³¹ The double voice of the chorus, confirmed by a *cis* tone in the melodic soprano part, orients the melody of the theme to the tonal centre.

³² In ancient Greek mythology, the Erinyes were goddesses of vengeance, handmaidens of Hades, the god of the underworld.

The second musical variation of *The Voices of the Portrait* occurs in Act One, Scene Six. Here Dorian learns of the suicide of his former fiancée, Sibyl Vane. In this variation, a „dynamic (presumably hand-operated) *Shift - GRM Tools*”³³ is added to the previous arrangements. In the second variation, Robert Rudolf again worked, „exclusively with the solo voice, so as to achieve micro-tuning at the same time as filtering the sound.”³⁴ The values of the delay effect varied only slightly. This first “detuning” hints at the doubts with which Dorian Gray is “grappling” - whether he is truly responsible for the death of Sibyl Vane.

The next “blot” on *The Voices of the Portrait* theme appears in Act Two, Scene Eight. Dorian Gray, along with Henry Wotton and Alan Campbell, enter the opium house. A typical bohemian life of gambling, alcohol and sex takes place there. Dorian offers two hundred pounds as ransom for four young men he wants to win for his own pleasure. Robert Rudolf writes that in the third variation „...alongside the effects already mentioned, more subdued but still present, a parallel transposed voice enters the scene seemingly following the melodic line of the theme. With its darker and at the same time unobtrusively indeterminate, almost sinusoidal timbre, it creates a kind of a shadow.”³⁵ In the opera’s audio recording, there are identifiable tones in the second phrase that, although they sound simultaneously with the notes of the soprano’s melody, are melodically unrelated to them and are “alien”; to the listener in terms of timbre. They are reminiscent of „neutral, electronically generated sound, timbral, devoid of the aliquot tones of the human voice - the sonic attribute of humanity”.³⁶ Technically, it is the interaction of several effects in the exact order of *Doubler and Morphoder - Waves, Harmony Engine - Antares*.

In the Act Two, Scene Nine, comes a huge breakthrough. Dorian kills his friend, the painter Basil, in an act of passion. Within this scene there are no less than two musical variations (numbers four and five) of *The Voices of the Painting* in fairly quick succession. During the fourth musical variation, Rudolf acknowledged the presence of the “shadow” from the previous variation of the theme and, along with it, brought to the fore the „...microtonal transposition [apparently a parallel voice transposed against the main voice at an interval of a maximum of one second] and delay [applied to the main voice] creating the aforementioned voice or rather a chorus of Erinyes.”³⁷ Between the almost - but not quite - identical tones of the main and parallel voices, strong shocks are produced. Whereas in the previous variations the sonically disturbing elements were less pronounced, the distortion of sound in the fourth variation can no longer be ignored.³⁸

The multiple transpositions of the solo voice in the parallel voices are confirmed in the fifth variation, along with Dorian Gray’s bothersome journey. The deeper transposed “shadow” ceases to [apparently dynamically] fluctuate. It more firmly connects with the line of the original melody, replacing it to some extent.³⁹ The fact that this “shadow” absorbs the originally clear and pure melody has its symbolism: Henry Wotton’s influence has absorbed Dorian to the point where he has become a monster, capable even of murder. From a pure and immaculate soul, he becomes a soul increasingly tainted by sins - the very soul that can be understood as the aforementioned sonic “shadow”. As Rudolf states, the accompanying chorus recedes into the background, although it is still the “mainstay” of the melodic line at the beginning of the theme. Later on, the chorus is also subject to a “static realignment”.⁴⁰ We interpret this as its transposition throughout the duration of this variation. At this point, Dorian is no longer who he once was.

The sixth musical variation appears at the end of Act Two, Scene Ten. Dorian threatens Alan Campbell that if he does not dispose of Basil’s dead body, he will send a letter to the media about Alan’s scandalous past. Within this variation, there is a „significant turning point in the development of incremental change”.⁴¹ The original solo voice undergoes changes: it fades into an “electronic envelope” and its basic colour also changes. The colour shift is intended by Rudolf to follow the development of the main character’s personality. The theme becomes less definite. The “detuning” along with the delay effect gradually moves into the foreground and the changes become more compact.⁴² The effects “parasitize” on the fading tones of the original theme are now almost fully sonically emancipated.⁴³ They may symbolize Dorian’s sins, because of which his soul begins to “rot”. The original colouring of the boy soprano loses its timbral purity.⁴⁴ Dorian’s forcing Alan to remove Basil’s dead body is, within the plot of the opera, Dorian’s ultimate sin. Therefore, the initially clear theme is already almost indistinguishable to the listener at this point.

The seventh musical variation is heard in Act Three, Scene Thirteen. Dorian comes face to face with Sibyl’s brother, James, who, before his sister’s death, had sworn that if Dorian harmed her, he would kill him. However, because of his young-looking face, James doesn’t recognize Dorian and lets him go. However, “Brothelmama” subsequently reveals to him that Dorian has sold his soul to the devil, which is why he looks so young. The melodic line, in the words of Robert Rudolf, is completely lost under the accumulation of effects such as transposition, multiplication of voices, delay, etc., and these elements replace the original theme. The accompanying chorus is completely absent. In its place, a new element appears in the form of electronically generated whispers.⁴⁵ It can be seen as a harbinger of misfortune - Dorian is truly unhinged at this point. Gradually he becomes aware of the decay of his soul reflected in the painting. At the beginning of the variation we hear rising tones, evoking tension.⁴⁶ He senses that something terrifying is approaching and is extremely afraid. The whisper is both a substitute for the choral accompaniment and a colourful addition to the sound of the variation. At Čekovská’s request, however, Rudolf has suppressed this whisper into the background.⁴⁷

The eighth musical variation is heard in Act Three, Scene Fourteen. Dorian is throwing a party in his house. It is clear that he does not want to be alone, for as he begins to become confused, fear takes hold of him. The colour of the sound changes, and through filtering it is stripped of the characteristic dimension of the human voice. The result is a half-electronic, half-human sound that, together with the aforementioned whisper, completes the transformation of Dorian Gray.⁴⁸ Dorian hallucinates - he hears the dead voice of Sibyl Vane. Screams echo from outside. The companion has killed James Vane, who was about to murder Dorian. Dorian begins to realize how many people have lost their lives because of him. A related mass of voices is clearing as the individual melodic lines gain independence. They follow quite independent directions.⁴⁹ The horrific sounds reaching the scene - as the melody suggests - “from different directions”, already remind us of the consequences of the protagonist’s actions, rather than a reflection of the protagonist’s inner self. Sliding glissandos from top to bottom sound uncoordinated in sharp highs and dark lows. Among the sounds, haphazardly evoking wailing, one, and a little later another, drawn-out note emerges at the end of the variation. Dorian is sure of what he is about to do.⁵⁰

The last, ninth musical variation of *The Voices of the Portrait* is heard at the end of Act Three, Scene Fifteen. Before it even

³³ RUDOLF, c. d., 2020.

³⁴ RUDOLF, c. d., 2020.

³⁵ RUDOLF, c. d., 2020.

³⁶ JESENIČOVÁ, Soňa: Communication per e-mail. [2020-04-20].

³⁷ RUDOLF, c. d., 2020.

³⁸ JESENIČOVÁ, c. d., 2020.

³⁹ RUDOLF, c. d., 2020.

⁴⁰ RUDOLF, c. d., 2020.

⁴¹ RUDOLF, c. d., 2020.

⁴² RUDOLF, c. d., 2020.

⁴³ JESENIČOVÁ, c. d., 2020.

⁴⁴ JESENIČOVÁ, c. d., 2020.

⁴⁵ RUDOLF, c. d., 2020.

⁴⁶ JESENIČOVÁ, c. d., 2020.

⁴⁷ RUDOLF, c. d., 2020.

⁴⁸ RUDOLF, c. d., 2020.

⁴⁹ RUDOLF, c. d., 2020.

⁵⁰ JESENIČOVÁ, c. d., 2020.

sounds, Dorian stabs the painting. By stabbing the painting, he kills his past, but it is Dorian who dies. The slightly longer final variation introduces a new element to the process of gradual change, which is the electronically altered melody of the solo voice. This modification reduces the quality of the solo voice and the result is acoustic "parasites". The whisper reappears, and then the already electronically modified original melodic line comes to the fore again. At this stage, it „duels with its previous transformations, transpositions and other elements of the process.”⁵¹ The disturbing acoustic elements that have been piled on top of the original theme in the course of the variations "diminish": dynamically, they become more and more in the background, and the original theme comes to the fore with increasing dynamics.⁵²

In the literary prequel, with the death of Dorian, the image takes on its initial form. In the opera, after Dorian's death, the original, "pure" theme is heard for the last time. Dorian's stabbing cleanses the portrait distorted by his sins. At this point, the "magic" that has kept Dorian young and beautiful for so long has completely worn off. It is for this reason that the horrifying image of the painting is transferred to Dorian's very appearance. Thus, although the image is cleared by the reappearance of the original melody, Dorian dies as a repulsive and ugly old man. The last note of the melody of the theme is interrupted by the orchestra's powerful cluster of dynamics in *forte-fortissimo*. Such an overly "noisy" and dissonant ending to his life may mean that Dorian is unlikely to find peace even in death.

6 Conclusion

Aesthete and social critic Oscar Wilde is one of the most important decadent writers of the Victorian era. His only novel, *The Picture of Dorian Gray*, presents the theme of obsession with youth and beauty, as well as the theme of human vanity and the destruction of the human soul. It bears the hallmarks of Faustian themes. The story tells of the life pilgrimage of a man who allows himself to be seduced by a world full of fun, excitement and pleasure. For a wide range of artists, *The Picture of Dorian Gray* has become a phenomenon that has been immortalized in many works of art.

The hero of the work under analysis is Dorian Gray. He is a young aristocrat, a gorgeous man who inherits his grandfather's house in one of London's preferred neighborhoods. He enters the action as a pure soul, a "tabula rasa". His encounter with Lord Henry, who exhorts him to a life of hedonism, proves fatal. The artist Basil Hallward paints a portrait of Dorian's face. Dorian, who recognizes himself in the portrait and realizes his beauty, expresses the wish that the portrait would age instead and he will remain forever young and beautiful. He offers his soul in return. His wish is granted, but it proves to be fatal to him. His every sin is reflected in the painting. The portrait turns into a rotten, sin-distorted image of Dorian's conscience. By stabbing the painting, he wants to destroy the portrait and be done with the past. The portrait clears, but the "magic" that has kept him young and beautiful for so long is lost, and the horrific image is transferred to the appearance of Dorian himself. He dies as an old, wrinkled man, with a repulsive face.

This work, timeless and still relevant today, is both a powerful message and a warning to today's population, which is obsessed with looking young and beautiful, wealth and carefree living. It comes as no surprise that Lubica Čekovská was intrigued by *The Picture of Dorian Gray* and decided to adapt the theme for the theatre stage.

The *Dorian Gray* opera is the first Slovak opera composed by a woman. The work has attracted the interest of reviewers from renowned foreign print and electronic media, such as *The New York Times*, *Opera New London*, *Opernwelt* and others. Many of the reviewers claim that this work by an ambitious female artist has enriched the Slovak music scene.

Throughout the opera, the composer used musical themes based on a common musical foundation, which she worked with in various musical variations. In the first act, the composer composed clear harmony using long-sounding rhythmic values of consonant harmonies. Over the course of the second and third acts, the transparent harmony gradually graduates to clusters, sharp dissonance, glissandos, and unnatural instrument positions. Long, dense, chordal harmonies, mostly of the higher third structure, are a prominent part of the opera's overall compositional language. The opera's instrumentation is simple in places - often allowing the sung words to stand out with or without chamber orchestral accompaniment, but at other times it is dramatically intense - sonically colorful with a preponderance of wind instruments and loud percussion strikes. Throughout the opera, Čekovská employs ostinato repetition of tone - a metronomic pulsation that may evoke in the listener a metronome counting down the time until the fulfilment of tragic events: meaning multiple deaths of important characters. As the death of the protagonist approaches, the glissandos of trombones and cellos sound, which can have an ominous effect on the listener.

The musical-textual analysis of *Dorian Gray* opera concluded that the focus of its musical language is the fifteen-bar theme - the leitmotif of the protagonist (*The Voices of the Painting*). Whereas in the literary prequel the image of the painting changes with each of Dorian's sins, in the opera the composer used this musical theme and its transformations as a metaphor for the changing portrait. On stage, each of Dorian's sins thus manifests itself in the wording of the theme, which gradually "takes on" an increasingly complicated form with each sin, culminating in a demonic version full of glissandos.

The work does not contain numbered arias in the sense of the older operatic tradition. The individual musical numbers concentrate mainly on the character of Dorian Gray, who essentially does not leave the stage during the entire opera. His part is vocally demanding, containing a varied range of delivery, mostly ranging from *e*² to *his*². The vocal parts of the opera's individual characters are often ended with a leap to a high note - specifically in escalated situations when the characters are desperate. Especially at the end of the opera, the composer of the music leaves particular parts of Dorian's vocal part without orchestral accompaniment, presumably to enhance the fact that he is left alone.

The Picture of Dorian Gray is a theme often discussed by many composers. Yet the focus of the authors' attention is largely on the individual characters - the relationships between them seemingly unrelated to the protagonists' character. In constructing our methodology and in applying it, in the spirit of publications devoted to defining the concept of character, we have confirmed the assumption that the analysis of the relationships between characters is an important factor.

By analyzing the characters and the relationships between them, we concluded that individual operatic characters are identical to fictional characters. The opera's librettist, Kate Pullinger, has preserved the essence of the work, selecting the most significant moments and dramatic situations from it. She has thus created a compelling operatic plot. There are a few minor shifts in subject matter between the literary source and the opera's libretto, but these do not change the plot in any significant way. The significant change, however, is the conclusion of the story. Whereas in the literary prequel the plot ends with the servants finding Dorian Gray's dead, wrinkled body, in the libretto the maid Lady Leaf enters the cleaned empty room in which Dorian died. This scene brings a hint of hope. It is during this that Čekovská makes use of a colorful symphonic epilogue, using chords of a higher third structure. The piano dynamics at the end of the symphonic epilogue (also *pp*, *ppp*, *pppp*) and the reverberation of the chords can be seen as the composer's intention to leave the audience open to wonder whether Dorian deserves forgiveness.

⁵¹ RUDOLF, c. d., 2020.

⁵² RUDOLF, c. d., 2020.

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THE USE OF ACTIVATING METHODS IN THE TEACHING OF VOCATIONAL SUBJECTS

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Abstract: Nowadays, it is necessary to use not only classic teaching methods but also non-traditional methods that can activate students to work independently and to find appropriate solutions to problems. At secondary vocational schools, the basis of students' education is the teaching of vocational subjects. Graduates of secondary vocational schools are expected not only to have professional knowledge, but also the ability to communicate, solve problems independently, work in a team, orient themselves in information. Therefore, teachers should include as many teaching methods as possible in the process of teaching professional subjects, which will enable students to develop and improve key competencies. Our goal is to describe examples of several specific activating teaching methods that can be applied to the teaching of various vocational subjects.

Keywords: Key competences, vocational training, activating methods

1 Introduction

Key competences as a new phenomenon in education represent a mutual connection between upbringing in the family, upbringing and education in the school environment and social influence on human development. Nowadays, the process of general competence development is perceived as a necessary process for applying to the labor market. All member states of the European Union deal with key aspects at least on a political level. Some countries of the European Union have enabled their citizens to participate in an open project for the development of lifelong learning.

1.1 Definition of relationships and basic terms

In the understanding of the term qualification, there is a consensus in the professional literature. According to Bendíková (2014), by the term qualification we understand the set of abilities (knowledge, skills, habits, experience) necessary to obtain official competence to perform a certain activity. Another explanation of the term qualification can be found in Hrmo-Turek (2003), who claims that qualification is mediated by external organizational processes, has a substantive orientation, and elements of individual ability to act can be certified. Bendíková (2020) already explained the qualification of an older date, but we can consider his interpretation still current. This is a classic definition of qualification, where qualification is seen as a synthesis of three components - education, experience, and individual characteristics of the worker. In professional literature, the term qualification is often associated with the adjective key. Pavlov (2018) also uses the combination of qualification with the adjective key. They see key qualifications as similar to key competences. As the first concept of key qualifications, Kissné Zsámboki (2021) characterizes them as: "such knowledge, abilities and skills that do not show an immediate and limited relationship to certain diverse practical activities." He distinguishes four basic forms of key qualifications:

- basic qualifications,
- horizontal qualifications,
- expanding elements,
- acquisition factors.

The aim of these forms is to recognize connections and subsequently manage changes. Mužik (2004) claims that the key qualification includes two elements. On the one hand, it consists of a person's expertise and, at the same time, his ability to transfer this expertise to various professional activities. We can point out that in the professional literature we often find that the authors' statements often diverge and there is a strict distinction between the two concepts, which can lead to the creation of a

distorted picture of the given issue. Having competence according to Hrmo-Turek (2003) means that we can orientate ourselves in the situation appropriately, react adequately and subsequently activate appropriate activity, adopt a beneficial attitude. Turek (2014) claims that someone who has the knowledge, skills, or motivation to do what is required in the relevant field in a high-quality and efficient manner is considered competent in a certain field. Competence can be understood as the intersection of acquired knowledge, acquired abilities, skills, forming attitudes, value orientation, motives for action (Turek; 2014). Competence is the unique ability of a person to act successfully and further develop their potential based on an integrated set of their own resources, in the specific context of various tasks and life situations, combined with the possibility and willingness to make decisions and take responsibility for decisions.

2 Components of competence

Competence is a relatively stable personality characteristic. If a manager has competence, he can use it in any company and at any management level. Competence tells us how the bearer will behave, think and express himself in certain situations (Porubčanová; 2018). We can divide the individual components of personality that enter into competences:

- Motives
- Traits
- Perception
- Knowledge
- Skills

In order to properly teach and identify competence from a number of published procedures, we present only the following:

- determination of the appropriate measure of work performance in order to identify top workers for the specified position and collect data on the given performance,
- analyze the elements of work behavior, create a list of characteristic behaviors, balance and analyze the grouping of behavioral manifestations,
- select and use tests to assess competences,
- determine the causal relationship between competences and work performance,
- the result is a validated model.

2.1 The importance of key competencies

Key competences are sets of knowledge, skills and attitudes that each individual needs for personal fulfillment and development, for involvement in society and successful employment. Key competences are the most important of the set of competences, they are suitable for solving a whole range of mostly unpredictable problems that will enable an individual to successfully cope with rapid changes in work, personal and social life (Hrmo, Turek; 2007). Key competences are the entire spectrum of competences that go beyond the boundaries of individual specializations. They are an expression of a person's ability to behave appropriately to the situation, in harmony with himself. As Belz and Siegest (2001) state, acquiring key competencies means having the ability and being prepared to learn throughout life. We can learn even as an adult. "Learning to learn" - this means the competent way in which an adult, adapted to the situation, accepts a lifelong challenge, especially in a collegial relationship with others, so that for him life is learning and learning is life. It is difficult to know and understand the competences correctly. It is important to recognize which behavior contributes to or determines the success of the given position that will be held by the employee. Without it, it is not possible to prepare successful training and development programs, to maximize the success of the selection of workers for given positions or to establish standards of good

performance (Pavlov, 2018). Key competence is an internalized, interconnected set of acquired knowledge, skills, abilities, attitudes and value orientations that are vital for the quality development of an individual's personality, his active involvement in society, effective employment and lifelong learning (Hrmo-Podari, 2013). The Institute for Economic and Social Reforms (2006) defines key competences as abilities and skills that enable an individual to successfully integrate into social and working life. This means holding different job positions and functions, solving unpredictable problems and coping with rapid changes in work, social and personal life.

The 2006 European Framework of Reference recommends that Member States use key competences for lifelong learning and sets out eight key competences:

1. communication in the mother tongue,
2. communication in foreign languages,
3. competences in mathematics and basic competences in the field of natural sciences and technology,
4. digital competences,
5. learn to learn,
6. social and civic competences,
7. initiative and entrepreneurship,
8. cultural awareness and expression.

Communication competences

Having the communication skills of competence means perceiving, expressing and interpreting concepts, thoughts, feelings, facts and opinions in written and oral form and, from a linguistic point of view, engaging in communication in an appropriate and creative way in various situations and social environments, including in foreign languages.

Mathematical and scientific competences

Having these competencies means functionally using mathematical knowledge and skills in various life situations, using basic knowledge and methods of science to clarify natural laws, applying them in the field of technology and explaining scientific and technical progress

Information competences

Having information competence means using a computer and its accessories to obtain, assess, store, create, present and exchange information and communicate and participate in collaborative networks via the Internet.

Problem solving skills

Having problem-solving skills means being ready to creatively and critically solve ordinary work and non-work problems independently.

Learning competencies

Having learning competencies means learning to learn effectively, to continue and persist in learning, to organize one's own learning, to effectively manage time and information, both individually and in a group, to evaluate the results achieved and progress in learning, to realistically set needs and goals of your further education.

Social and personal competences

Having these competencies means setting appropriate goals for personal development in the field of interest and work, taking care of your health, cooperating with others in the group and contributing to the formation of appropriate interpersonal relationships based on your knowledge of your personality.

Work and business competences

Having these competencies means turning thoughts into actions, optimally using your personal and professional prerequisites, applying creativity, innovation and risk-taking, planning and managing projects to achieve goals, for successful application in the world of work, seizing opportunities for building and developing your professional career, also in lifelong learning.

Civic and cultural competences

Having these competencies means recognizing the values and attitudes essential for life in a democratic society and adhering to them, constructively participating in the events of society, acting in accordance with its sustainable development, realizing the importance of creative expression of thoughts, experiences and emotions, supporting the values of national, European and world culture.

In addition to communication in the mother tongue, communication in foreign languages, competence in mathematics and basic competence in the field of natural sciences and technology, digital competences, learning to learn, social and civic competences, initiative and entrepreneurship, cultural awareness and expression, some countries also develop cultural sensitivity, work and business competences and health education. In 2018, the European Council adopted the updated Council recommendations on key competences for lifelong learning. The aim of the recommendations is to support the development of key competences and basic skills through:

- high-quality education,
- professional training and lifelong learning for all,
- support of teaching staff,
- analysis of approaches to assessment and verification of key competences.

The Education and Training Monitor report (2019) presents the goals of the European Union. These goals relate to early school leaving, early childhood primary education, graduate unemployment rates, tertiary education, increasing literacy, numeracy and science literacy, and adult education.

According to the decision of the European Parliament and the Council of the EU no. 1720/2006/EC of 15 November 2006, which implements the program in the area of lifelong learning, defines lifelong learning as "all general education, vocational education and training, non-formal education, vocational education and informational learning during life, where its result is the improvement of knowledge, skills and abilities in personal, civic, social or employment-related efficiency". According to this definition, we can understand lifelong learning as a process of adaptation to changing conditions during life and a prerequisite for continuous personality development. Eight key competencies have been identified and identified by the document as those needed by all individuals to:

- personal satisfaction and development,
- active citizenship,
- social inclusion and employability. (Recommendation of the European Parliament and the Council on key competences for lifelong learning, 2006).

Hrmo and Turek (2003) attribute the economic benefit of key competencies to the following phenomena:

- productivity growth and increasing competitiveness,
- development of an adaptive and qualified workforce,
- creating an innovative environment.

The active approach of the individual and the modern concept of educational policy is an emphasis on the concept of learning, which enables multiple, frequent transitions between education and employment, enabling the acquisition of "qualifications and competence through different paths and at any time during life" (Pavlov, 2021). The labor market is a complex market that

requires the expertise, knowledge and ability of each individual individually. Each of us has encountered increasing demands on individual job positions, knowledge of the company, or stressful situations. Therefore, according to Hrmo and Podaril (2013), much attention is paid to life-long learning, but also to the improvement of qualifications and the development of key competencies, because they are directly related to the employment of a person in the labor market. Other educational opportunities are also defined by the OECD, which understands educational opportunities in both the formal and informal sectors as one interconnected system that should enable the acquisition of qualifications in various ways and at any time during life. The process of changes, whether they are personal, work or social, of which there are many during life, tend to be a reflection of the need for lifelong learning. Adaptation to change is a complex increase of those who cannot adapt to change. That is why the concept of a learning organization resulting from the strategy of lifelong learning, expressed in the Memorandum on lifelong learning (2000), was created. The European Council and the member states of the European Union have defined a comprehensive lifelong learning strategy for Europe with the objectives of:

- guaranteeing general and permanent access to learning for the purpose of acquiring and renewing skills, the so-called principle of "new basic skills for all"
- visible growth of investments in human resources,
- development of effective teaching and learning methods, or so-called teaching and learning innovation",
- a significant improvement in the way of understanding and evaluating the results of learning as an activity and its results with an emphasis on evaluating learning,
- ensuring access to information and advice,
- bringing the opportunity for lifelong learning as close as possible to people, i.e. homes, regions, etc.

The Memorandum on Lifelong Learning (2000) also talks about the so-called lifelong learning. This defines learning so that learning takes place regardless of life stage, place, time and form of learning. The lifelong learning strategy focuses on six basic ideas:

1. new basic skills for everyone,
2. more investments in the development of human resources,
3. innovation in the teaching and learning process,
4. the value of education,
5. new concepts of consultancy,
6. finding a path leading to easier access to education (Veteška, Turieckiová; 2008).

2.2 Criticism of key competencies

Currently, we are witnessing a transformation of the content of education in favor of favoring competences. Bendíková (2020) calls this phenomenon a "turn to competences", Turek (2014) talks about competence orientation in adult education. It is possible to observe tendencies to replace classic encyclopedic knowledge with knowledge useful for life, while emphasizing especially their applicability to real life. This trend is aptly expressed by Marks-Lajčín(2017). He emphasizes that mental capacity should no longer be used as a repository of facts, but should be used as a trigger headquarters for intelligent responses. Kaščák and Pupala (2010) talks about the requirements for the new curriculum, which is also reflected in:

- new emphases at the level of regional education standards, qualification profiles,
- performance standards of teachers and in national testing systems.

Kaščák and Pupala (2007) compare the change of the curriculum due to the prioritization of competences to its change to the business curriculum. Here we come across the fact of assessment quality of education based on the criterion of economic utility. At the same time, it is desirable to realize that such characteristics as entrepreneurship and initiative are explicitly

expressed in the list of key competencies. The authors, and I with them, are aware of the reality of assessing individuals based on the sum of their competencies, which contribute to the economic prosperity of society. A similar opinion is held by Ribboliti (2004), who draws attention to the perception of the educational system as a supply agency for economic events with the aim of creating an economically usable workforce. According to the author, lifelong learning should lead people to function as a cog in the political-economic system, the driving force of which is the transformation of money into more money and certainly not the humanization of the world. He sees learning as an act of subjection, not liberation, not the education of individuals, but only the education of "capital" through the qualification training of subjects for potential purchasers of labour-power goods. We find the coercive rather than the voluntary character of lifelong learning in the work of Kaščák and Pupal (2010): who claim that the education model framed by the requirement to shape competences is a radical intervention in the overall concept of education. Its basic feature is the effort to dissolve the dividing line between general and professional education through the establishment of competences as the goals of education and as the principle of designing its content." to cover such needs that belonged more to the goals of professional education. I find their warning about the disappearance of general education in its generally cultural and academic concept alarming and worthy of thought. Kissné Zsámboki (2021) claims that he particularly notices changes in relations between social groups: "The introduction of competences in education is the basis of new power relations between social groups, because it introduces asymmetry in favor of employers, entrepreneurs, economic practice at the expense of schools, teachers, students , general culture.

3 Vocational secondary schools in Slovakia

We can generally define a school as "an institution that specializes in training as opposed to a company that offers training in conjunction with the production of goods. Some schools, such as those for barbers, specialize in one skill, while others, such as universities, they offer a wide and diverse set. Schools and companies act as substitute sources for specific skills" (Porubčanová, 2018). Secondary vocational school, which offers opportunities for we will investigate increasing the employability of its graduates, we understand a school which graduates can obtain upper secondary education completed by the matriculation exam. At evaluation of a (specific) secondary vocational school, we must take into account that its competences are limited to some extent by applicable legislation. With the reform in 2008 in education they also introduced state educational programs (hereafter referred to as SVP), which define and delineate the content ducation and training in schools in accordance with internationally valid standards. ŠVP defines:

- a) the generally binding goal, content, scope and conditions of education at ISCED for the given groups of study fields,
- b) the target quality of the student's personality, which the student has after completing education and training to reach,
- c) rules for creating school educational programs, evaluation of results education,
- d) binding basis for determining financial resources." (ŠVP)

The Vocational Education and Training Act of 2009 established the rights and obligations of all participants and created space for the involvement of employers and employers' unions as well as private investment capital in the vocational education and training system. The reform of secondary vocational education was supposed to enable a more flexible profiling of graduates of study fields according to the conditions of the school. At the same time, the fields of study should respond to the needs of the regional labor market and the individual abilities and interests of the pupils. All state secondary schools in the Slovak Republic are obliged to comply with the Education and Training Act (245/2008 Coll.). According to this law, the goal of upbringing and education is to "enable a child or pupil to get an education (according to this law), to acquire competences, especially in the

field of communication skills, oral skills and written skills, use of information and communication technologies, communication in the state language, mother tongue language and a foreign language, mathematical literacy, and competence in the field of technical natural sciences and technologies, for lifelong learning, social competence and civic competence, entrepreneurial skills and cultural competence, command of the English language and at least one. For each group of study fields with experience, with through professional training and extension studies, there is one SVP, another foreign language and being able to use them, learn to correctly identify and analyze problems and propose their solutions and be able to solve them, develop manual skills, creative, artistic psychomotor skills, current knowledge and work with them on practical exercises in the areas related to further education or current requirements on the labor market, learn to develop and cultivate your personality and lifelong learning, work in a group and take responsibility." Thus, we see that the law responds to new trends in technology and the economy and focuses on the development of a wide range of knowledge, skills and abilities. On the one hand, we will be interested in how the secondary vocational school we have chosen helps to fulfill work with current knowledge, which is required by the labor market, and on the other hand, which area of competence employers value the most. Despite the fact that, at first glance, pedagogues have relatively high autonomy because they work in the classroom without external control, "in educational situations they are required to assess the child's needs themselves, react flexibly and carry out effective interventions. On the other hand, in educational situations, they are still significantly limited by the uniformity of educational goals and contents, the overcrowding of which leads to the uniformity of forms and methods of education" (Kaščák- Pupala 2007).

3.1 Key competences of a secondary vocational school graduate

According to the SVP, a graduate of the Secondary Vocational School has the following key competencies to develop during their studies at this school: Competence for lifelong learning - with this competence, the graduate realizes the need for autonomous learning as a means of self-realization and personal development, is able to reflect on the process of own learning when acquiring and processing new knowledge, and applies various learning strategies. The graduate is able to think critically and evaluate information and use it practically, and subsequently knows how to accept feedback. The graduate can become familiar with motivational programs that are aimed at solving problems. The graduate realizes the need for autonomous learning as a means of self-realization and personal development.

Social communication competences - with this competence, a graduate can use all available forms of communication when processing and expressing information of several types, has adequate oral and written expression. The graduate masters self-presentation and knows how to translate the results of his work to the public, where he uses professional language. The graduate understands the meaning and applies the forms of communication skills that are the basis of effective cooperation, based on mutual respect for rights and obligations to take personal responsibility.

Competences to apply mathematical thinking and cognition in the field of science and technology - the graduate uses mathematical thinking to solve practical problems in everyday situations. It uses mathematical models of logical and spatial thinking. He knows how to use the basics of natural literacy, which will enable him to make scientifically based judgments, while he knows how to use the acquired operational knowledge to successfully solve problems.

Competences in the field of information and communication technologies - the graduate effectively uses information and communication technologies in his education, creative activities, project teaching, expressing his thoughts and attitudes when

solving real-life problems. The graduate realizes the importance of recognizing virtual and real life. He understands the opportunities and possible risks associated with the use of the Internet and information and communication technologies. He knows how to think algorithmically and controls the operation of peripheral devices necessary for the operation of the used program. The graduate can assess the credibility of information sources, proceed critically to obtain information and then record, sort and store this information in such a way that he can use it at work or in his personal life.

Competence to solve problems - the graduate applies appropriate methods based on analytical-critical and creative thinking when solving problems. He formulates arguments and evidence to defend his results. The graduate knows the pros and cons of individual solutions, where he is also aware of the need to consider their risk levels. Can resolve conflicts constructively and cooperatively. The graduate is able to clarify the most serious features of problems in the form of systematic knowledge and to use various generally applicable rules for this purpose. The graduate can evaluate the meaning of various information, independently collect information, sort it and use only those that are most important for clarifying the problem. The graduate can take creative risks, adequately criticize, take a clear approach to solving problems, make quick decisions, be consistent, inspire others when looking for ideas, initiatives and creating possibilities.

Civic competences - the graduate is aware of basic humanist values, the meaning of the national cultural heritage, applies and protects the principles of democracy. The graduate understands his personal interests in connection with the interests of the wider group. He is aware of his rights in the context of a responsible approach to his duties, contributes to the fulfillment of the rights of others. The student can understand the systemic nature of the world. It recognizes that decisions made, and actions taken by individuals or groups will have an impact on the global present and future. The graduate is oriented in the issue of uneven economic development, ethnic, religious and racial conflicts, terrorism and suggests ways to eliminate them. He understands the concepts of justice, human rights and responsibility, where he can apply them in a global context. The graduate observes the law, respects the rights and personality of other people, their cultural specificities, speaks out against intolerance, xenophobia and discrimination. At the same time, the graduate is actively interested in political and social events in Slovakia as well as in the world.

Social and personal competences - the graduate reflects his own identity, builds his own autonomy and independence as a member of the whole. Based on self-reflection, he sets his goals and priorities in accordance with his real abilities, interests and needs. Significantly participates in setting corresponding short-term goals aimed at improving own performance. He knows how to verify and interpret information and subsequently establish hypotheses. It creates a value system. The graduate is able to fulfill a task plan aimed at the given goals and try to improve them through the use of self-control, self-regulation, self-evaluation and own decision-making. At the same time, he can verify the acquired knowledge, critically assess the opinions, attitudes, and behavior of others. He has a responsible attitude towards his health, he takes care of his physical and mental development, he is aware of the consequences of an unhealthy lifestyle.

Work competences - the graduate can set goals with regard to his professional interests, critically evaluates his results and actively approaches the realization of these goals. He is able to accept and manage innovative changes. The graduate understands the principles of business and considers his assumptions when planning and applying it. Can obtain and use information about educational and employment opportunities. The graduate understands and is able to evaluate his participation in the educational process and its outcome, which ensures the citizen's right to free movement to live, study and work in the conditions of an open market. He knows how to assess the professional

offer on the Slovak and European labor market and flexibly respond to it through further education. He knows how to present himself and act appropriately during a job interview. He can search for and assess business opportunities in accordance with the reality of the market environment, his assumptions, and other possibilities.

Competencies aimed at initiative and entrepreneurship - the graduate can innovate the usual procedures for solving tasks, plan and manage new projects with the intention of achieving goals, not only in work, but also in everyday life. He knows how to navigate various statistical data and know how to use them for his own business. The graduate recognizes and develops the qualities of a managerial employee with an aspect of communication skills, assertiveness, creativity and resistance to stress. Uses the principles of constructive criticism, being able to criticize appropriately, but also to tolerate criticism from others. He knows the principles of safety and health protection at work.

Competencies to perceive and understand culture and to express oneself with the tools of culture - the graduate is able to express himself at a higher level of artistic literacy through the expressive means of visual and musical arts. He is aware of the importance of art and cultural communication in his life and in the life of the whole society. The graduate knows the rules of social behavior and at the same time behaves in a cultured manner, appropriate to the circumstances of the situation. He is tolerant and empathetic towards expressions of other cultures.

4 Conclusion

All OECD countries agree on the importance of key competencies. The need to develop key competencies at all levels, but also in lifelong learning, has been a topical topic for a long time. According to the obtained information, which is presented in our article, the most important knowledge, skills and abilities that are required to achieve success in employment as well as in personal life are listed. Significant attention is paid to work with key competencies. It is known that the need for key competencies and their lifelong development means that there is potential for a better workplace, personal life or personal development. In the school educational program and subsequently in the study and teaching fields, the graduate's key competencies are developed by making knowledge available in an appropriate and comprehensible manner with an emphasis on the development of all key competences without prioritizing one key competence over another. Suitable key competencies are those that are activated in new situations and subsequently offer a wide range of possibilities for quickly and successfully solving the given problem and coping with the changes that new situations have brought.

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POSITIVE EDUCATION IN SECONDARY SCHOOLS AS A REQUIREMENT OF FORMATIVE EDUCATION

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Abstract: The main goal of this theoretical study is the analysis and interpretation of innovative processes of formative education. Education, towards the "dialogue of education" in the context of the modernized concept of positive psychology. The goal of every modern pedagogical concept is to improve education and make it more effective. The significant impact of innovations within the educational process have been created by the elements of modern and alternative concepts. Pedagogical practice is currently largely focused on the application of elements of positive psychology to the educational process and on a positive approach to education, supporting and developing positive aspects and traits of students' personalities, and supporting formative education. Positive psychology and pedagogy are based on the requirement that schools must prepare students for life, making them a key starting point for current education. Their application to a school initiates the creation of a positive model of such school, promoting the strengths and potentials of individuals. Attention is focused on solving and correcting negative phenomena in schools, and towards supporting and developing the best qualities in teachers, students, all actors in school life, but also schools as institutions.

Keywords: formative education, formative assessment, positive education and psychology, motivation

1 Introduction

The goal of every modern pedagogical concept is to improve education and make it more effective. The significant impact of innovations within the educational process have been created by the elements of modern and alternative concepts. Pedagogical practice is currently largely focused on the application of elements of positive psychology to the educational process and on a positive approach to education, supporting and developing positive aspects and traits of students' personalities, and supporting formative education. Positive psychology and pedagogy are based on the requirement that schools must prepare students for life, making them a key starting point for current education. Their application to a school initiates the creation of a positive model of such school, promoting the strengths and potentials of individuals. Attention is focused on solving and correcting negative phenomena in schools, and towards supporting and developing the best qualities in teachers, students, all actors in school life, but also schools as institutions.

2 Source of positive education – positive psychology

Positive psychology is a science dealing with the study of positive emotions such as joy, happiness, love, hope, positive life events and experiences (it concerns optimal experience – flow). In terms of research, it focuses on the study of positive individual qualities and personality traits (optimism, curiosity, sense of humour). Although its beginnings date back to the second half of the 20th century, the rise of scientific research and interest in the positive aspects of a human and society come at the beginning of the 21st century, when the Positive Psychology Center was established. The International Positive Psychology Association (IPPA) was established abroad. Its main mission is to support determinants and factors that enable individuals, communities, societies to flourish (Seligman, 2002, Peterson, 2006, Csikszentmihalyi, 2014). Research into positive psychology, human happiness, preparation of a person for experiencing a better life in future was the topic of studies by Seligman 2002, Csikszentmihalyi, 2014, Slezáčková, 2014, Trčková, 2016, Gajdošová, & Bisaki, 2015, and others.

Positive emotions play an important role, serving as indicators of flourishing or optimal well-being, a happy life and objective human happiness. Since 1991, the trio of scientists, Diener,

Sandvik and Pavot, has been carrying out scientific work concerning the balancing of positive and negative emotions (Diener, 2000).

Positive emotions over the long run need to be cultivated not only as the ultimate state of a human, but also as a means to achieving growth and improving the quality of a person's life during their life. Positive psychology and positive education put preferential emphasis on the positive aspects of the personality, its possibilities, potentialities, and focus on the study of positive areas of human life. In the school environment, this concerns the positive aspects of a student's personality, cultivating the positive possibilities of a student, improving his/her motivational potential. Research into positive individual characteristics and personality traits, such as optimism, curiosity, resilience, coping, sense of humour, came to the fore (Hanuliaková, & Porubčanová, 2019).

Seligman et al. (2005) emphasise that positive psychology uses the same set of tools as traditional psychology, so positive psychology did not require the creation and building of a new construct. All that was necessary was to change the object of interest - i.e. to move away from "repairing" the bad, negative in life, and turn to creating, developing the best in life. It is about promoting the optimal functioning of the human being, as well as the belief and hope that they will succeed. According to Trčková (2016, p. 2 - 3), "positive psychology's endeavour is to move towards positive values (sense of positive experience, life satisfaction) through what is healthy and functional in a person's life, and perhaps to strengthen the ability to cope with difficult and conflict situations." Positive psychology looks in its research, as well as its practice, into the quality of life, personal well-being and issues of positive emotions, emotional intelligence, mental health under the influence of school and family education (Tamášová-Kušnieriková, 2018, Szobiová, 2018, Furlong, 2018, Petruelytė, 2018, Sanchez - Núñez, García - Rubio, et al. 2020) and optimal experience - flourishing (Huppert, & So, 2011).

Why is it necessary to apply the elements of positive psychology to educational practice? The authors, Smitha Ruckmani & Balachandra, (2015), Zelina (2016), Vendel (2018), Gajdošová (2018), Ročková (2018), Furlong (2018), draw particular attention to building resistance to crises, burdens, conflicts, manipulations, to the importance of providing advice and procedures on how to overcome negative news and stimuli from the world, but also personal crises and stress. Positive psychology directs its focus on salutogenesis, the psychic forces in a person helping them to reach happiness and self-realisation. A school should be a place that promotes a healthy lifestyle and the development of physical as well as the mental health of students.

Đuriš (2014) writes, e.g. that the current state of evaluation of learning results is linked to several problems that can cause stress in students:

- the assessment focuses on the shortcomings and ignorance of the student, much less on his/her strengths,
- the assessment frequently disregards the differences in students' personalities,
- the assessment often times compares students' performance, thus demotivating weaker but still able students,
- requirements for students are often shaped by the content and not the activity to be demonstrated by students at the end of learning.

If the assessment is to be improved, students should know in advance what is expected of them and what will be the subject of assessment, otherwise the student is not sufficiently motivated for the lack of idea about the requirements. The level of logical

thinking, creative and evaluative thinking, and not only memory knowledge, should also be evaluated in students. Assessment should be rich in information so that the student clearly understands in which area he/she needs to improve. An important part that can subsequently strongly motivate the student is when the teacher praises him/her in the assessment, encourages, expresses confidence and suggests that it is possible to work on the student's weaknesses and make progress in them.

A school that uses the model of positive education and formative education works from the PERMA model of a happy life by Seligman (2002, 2005, 2011), determined by the following determinants:

P – positive emotions: the school develops, cultivates and focuses on experiencing as many positive emotions as possible like joy, pride, gratitude, astonishment, interest, curiosity, love, hope, serenity – inner peace. Especially in the current covid-19 pandemic, when stress has become an everyday part of family and school life, the inner peace students experience is very important.

E – engagement: the school supports and seeks the interests of children, supports their deep and sincere interest in activities that can grow into a professional focus, a profession. The school works with children's strengths, encourages their curiosity, interest in the curriculum, and school life. There must be a transformation from students' lack of interest in the curriculum towards their engagement in school activities and school life.

R – positive relationships: school is an institution where interactions happen on many levels every day. Their quality is a necessary condition for a safe emotional and social climate and atmosphere, which is intensely perceived and evaluated by students, teachers and other school staff. The school supports and emphasises good and valuable relationships at school. It leans on values that are defined and observed by the school. These values are based on mutual relations at all levels of communication (teachers, students, leadership, parents) and also serve as a moral compass of coexistence. The school focuses on a formative and supportive approach in the education and training of students.

M – meaning: school, environment, relationships, life, the future must make sense to all concerned, it must show meaning, and it teaches students that what they do should make sense. Students must perceive and understand the validity and meaningfulness of the activities performed.

A – accomplishment: students, teachers, parents must experience greater or lesser accomplishment, which promotes their further growth and development. Every student in the class wants and must experience success in the framework of educational activities. Satisfying the needs of students at school is focused primarily on achieving positive results in testing the acquired knowledge. In the context of a happy life of a student, the school must appeal to meet the needs such as security, belonging somewhere, self-realisation, self-confidence, self-esteem, which are important not only for the school-attendance period, but also for their following life.

Seligman's theorems of positive psychology are the basis of the Social Emotional Health model by Furlong et al. (2014), as well as Furlong (2016), stating that it is necessary to look at the strengths of personality and at that what truly makes the meaning of human life. It is on these postulates that the Furlong's concept of covitality is based, and it is the result of systematic work in this area with the intention of finding a link between the personality's strengths and human well-being (Boman et al, 2017). Furlong et al. (2014), in creating the concept, deliberately focused on the school population in order to diagnose the level of social emotional health in childhood and adolescence. The results of their work create opportunities for effective intervention in the field of social and psychological prevention as well as personal development.

3 Positive education supporting students' potentiality vs formative education

The subject of positive psychology encompasses the following issues: happiness, well-being, love, friendship, joy, positive thinking, cooperation, trust, optimism, humility, enthusiasm, interest, creativity, resilience, altruism, empathy, forgiveness, spirituality, meaning of life, etc. These concepts though are rarely included in the daily educational activities of a teacher and learning activities of a student. Within the teaching activities, teachers are often oriented primarily to mediating the largest possible content of the curriculum, its revision and evaluation of students' mastery of it. They create less room for supporting and developing emotions that will accompany the students throughout their lives and which they must learn to work with. One of the reasons why teachers pay minimal or no attention to emotions in teaching is probably their unpreparedness, or possibly their inability to design a teaching unit so that the teacher can work with a student's emotions, the emotions of the classroom as a team and also with the social dimension of the classroom environment, as report Hanuliaková and Porubčanová (2019).

Positive education within formative education has its potentialities, the main idea of which is the well-being of students, which supports their education and develops them as good people and citizens. A good school is not purely oriented on achieving academic potential for students (Krásna, 2019, p. 81 - 88), but also aims to develop students' personalities as caring, responsible, and ultimately as productive and valid members of society and in life. According to Vendel (2018), the way of treating the student as an individual at school is also important. It is correct if students have ample opportunities to take over responsibility and take part in school activities. Students also gain a lot from the opportunities in which teachers and students participate in joint activities so that they can get to know each other better and learn to appreciate each other's positive qualities.

In the context of positive psychology, it is possible to define positive and formative education as education for traditional life skills and education towards a happy person. Positive education is based on the best teaching strategies in order to facilitate the achievement of the best educational outcomes that support the security and well-being of students. Teachers' teams often discuss whether schools should strive for a high level of student performance or to be a pleasant place for students. This can be viewed as an unnecessary contradiction. Students tend to work better and learn more when they enjoy and have fun during school events. The same is true the other way around, if they are "doing well" at school, it is likely that they will feel satisfied in it. Nonetheless, one important aspect must be respected, and that is that students differ in their school potential and performance.

Especially students with good skills, who are socially mature, conscientious and attractive, do well at school. Those students who lack these qualities experience fewer successes at school. Therefore, it is important that students be evaluated and rewarded for what they know and not be punished for other students achieving a higher level of knowledge than them. It is also important to ask the question of how good education affects a child individually? How can it perform a protective function? Research of children with certain psychological risks emphasises that two types of experience are important in eliminating the effects of stress and unhappiness, according to Vendel (2018). On the one hand, these are harmonious, warm personal relationships, and on the other hand, an experience of success leading to a feeling of self-confidence and personal performance of the student. The school provides opportunities to establish friendships between students, but it also facilitates quite different relationships, particularly those that students form with adults (other than parents) whom they love and respect. The child needs to be respected and to experience success, which is a strong motive for him/her. The child can cope better with stress, gain self-confidence, but to do so he/she also needs social support, where the school is an important helper. Positive psychological

interventions include decision-making, problem-solving skills, relaxation, and creative brainstorming. The use of this knowledge in positive and formative education and assessment improves mental health and well-being, reduces depression and anxiety, and improves academic success and creative thinking, eliminating student's stress. Positive psychology is beneficial for teaching activities mainly in approaches and strategies that give credit to humanistic teaching, which will be the content of further subchapters below.

3.1 Approaches and strategies

Zelina (2016) divided the ideas and starting points of a positive approach to school, upbringing and education into the following areas:

- *Student's cognitive development* – the student should enjoy thinking, discovering new knowledge from learning and problem solving. Based on the principles of positive psychology, the student should appreciate the importance of knowledge, appreciate education and the learning process. Leading students to a love of knowledge and leadership is possible through problem tasks, heuristic methods, project teaching, the application of metacognition strategies and self-regulated learning. The school focuses on the student's wisdom, desire for knowledge, self-efficacy, goal setting, hope, optimistic way of understanding life, optimism and well-being.
- *Potentialities for life* – a positive attitude towards education is a necessary condition for lifelong learning, attitude towards retraining within job *opportunities* – EU Council Conclusions of 8 June 2020 – Reskilling and Upskilling, raising one's qualifications through self-study, supplementary study, but also in the context of informal and non-formal education.
- *Positive emotions* – the student likes school, learning, likes going to school and has good feelings about what he/she learns, feels good among *classmates*, must feel that the teacher cares about him/her, comprehensively perceives the climate at school and in classroom as positive, even despite the occurrence of a failure, disappointment, fear and tension. The student can apply positive self-esteem and at school can experience the ultimate emotional and life experiences, emotional creativity, subjective emotional well-being. Emotional education is carried out by strategies of staging, situational methods, creative drama, art and therapeutic procedures. Positive emotions in the classroom are not associated with fun; a pleasant school experience should be associated with learning demands.
- *Potentialities for life* – be able to verbalise one's own feelings and emotions in family ties, in relationships with partners, in various roles, eg., parent, partner, colleague. Honest and open verbalisation of emotions can represent a prevention against the occurrence of socio-pathological phenomena, but also against aggressive behaviour.
- *Positive motivation* – the student is guided towards the meaning of life, universal human values, positive goals, the acquisition of the values of the *relationship*, school values. The opposite is burnout, reluctance to learn, resignation, indifference, disinterest, aggression, lack of faith and belief in values.
- *Potentialities for life* – the creation of attitudes and the internalisation of values in relation to one's own person, values in relation to moral aspects, to the rules of life, to society.
- *Positive socialisation* – in students, the aspects of the personality are strengthened that create productive interpersonal relationships, solidarity, cooperation, tolerance, help, charity, so that there is a positive atmosphere and climate in the classroom and at school, which is achieved by promoting empathy, quality relationships. A positive school and classroom climate leads to crime prevention, reduces reluctance to cooperate, reduces bullying, discrimination, hatred, selfishness, promotes the ability to tolerate and leads to humility.

- *Potentialities for life* – ability to work within the framework of social skills in coping with and solving challenging situations and tasks, *developing* one's own knowledge and skills within mental hygiene. Ability to reflect on job opportunities, adaptation to the work market, active citizenship, active participation in voluntary activities, participation in charity and developing one's own prosocial behaviour and solving challenging situations and tasks, developing one's own knowledge and skills within mental hygiene.
- *Autoregulation* – students learn independence, self-management, discipline, responsibility to have a desire to learn, to lead *students* to be independent in what they can do on their own, they learn to control their thinking (concentration, attention, perseverance, control over their emotions, fear, anger, bad mood), control their behaviour (psychomotor control).
- *Potentialities for life* – students are able to determine the order of life and work goals, daily routine, distribution of activities over time, to lead a person towards life self-discipline.

4 Application of positive psychology in educational practice

In order to apply positive psychology in pedagogical practice, it is necessary to look at the matter through the satisfaction of students' needs. According to Zelina (2018), the application of the elements and effects of positive psychology in pedagogical practice shows that:

- i) - self-discipline, intrinsic motivation, which is particularly emphasized by positive psychology, is twice as good a predictor of performance, application and success in life as IQ and EQ;
- ii) - happy young people in adolescence, as shown by longitudinal research, have higher incomes in adulthood;
- iii) - engagement and meaningfulness of activities, accepted by positive psychology, are the best prevention of depression;
- iv) - positive experience and meaningfulness of being supports life satisfaction and has a positive effect on the learning process, especially on creative learning.

Based on positive psychology, it is necessary in the educational process to respect the principles that have a positive effect on the educational reality and transform them into everyday life. The basic didactic principle is the combination of theory and practice, and therefore it is necessary to emphasise the principles of positive education, along with formative education and assessment, which can be transformed into the daily life of students and teachers (Huppert, F., & So, T., 2011, Geršicová & Barnová, 2018).

4.1 Principles of positive education

The principles of positive education are mainly:

- provision of a positive school climate and school culture, where these include also a positive family climate, living climate (Greškovičová & Maršičová, 2018, Tamášová & Kušnieriková, 2018; Ikhart & Szobiová, 2018);
- respect for positive values;
- positive application of knowledge in life with an emphasis on quality education;
- application of strategies to support critical, evaluative thinking and self-assessment;
- creation of productive interactions, teacher-student relationships based on empathy, acceptance of each individual;
- motivation to learn, in addition to classical methods, also through interesting tasks, using the method of relational frameworks and causal attributions;
- emphasis on self-reflection, self-evaluation, self-control, self-management of the student with the use of self-regulation learning programmes, self-knowledge programmes, programmes in social psychology, character cultivation programmes;

- emotional experience of the climate in the classroom, at school, its detection and change positively, evaluation of students' experience of learning and educational activities, teaching students to express emotions, feelings and control them, especially in stressful situations, communicate openly, creatively, and focus on rational communication as well as communication of feelings, emotions and experience (Zelina, 2016).

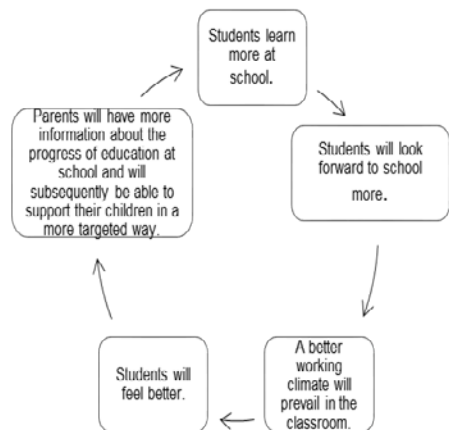


Figure 1. Why use formative assessment in teaching? (Starý & Laufková et al, 2016, p. 24).

In the family, it is also necessary to create a positive attitude of parents towards children, because they shape their social-emotional health. The family influences the child with its cohesion, cultivates their self-confidence, self-efficiency, optimism, life engagement (optimism, enthusiasm and gratitude). According to the researchers, Smitha Ruckmani & Balachander (2015), family harmony and satisfaction are key factors that positively condition the mental health of adolescents. Emotional well-being is a significant protective factor against the development of mental problems, or mental health problems. Science and research in positive psychology, which lay the grounds for positive education, clearly show that identifying one's strengths and focusing on developing the ability to cultivate and exploit these strengths (rather than "correcting" mistakes) leads to greater well-being and better academic and social results. A positive approach in education helps students to build confidence in education, in developing students' intellectual abilities and character, in developing the affective side of personality. Investing in positive education and formative education at the level of the whole school community in both in-school and out-of-school environment results in helping students to become a better version of themselves as individuals and as part of the community.

5 Conclusions

The results of research and scientific literature suggest that the positive psychological interventions support students' intensive relationship with the school or school facility. In order for the application of elements of positive psychology in educational practice to be accessible and practically feasible, the school management must at a broader level, or in a broader school context, adopt and develop the theory of positive education. When applying the given elements to the educational process, the school principal can first start doing so in cooperation with pedagogical and professional staff, especially school psychologists, as suggested by Gajdošová (2018).

According to Gajdošová & Bisaki (2015), the introduction of positive psychology into school and the building of the "positive school model" supporting the strengths, virtues, potentialities of individuals also initiates a significant change in school psychology and the work of the school psychologist, especially the reorientation from addressing negative phenomena in the school towards developing the best qualities of the school as an institution and the people in it. The application of positive

psychology at school means a new way of viewing upbringing, education, oneself, the world and oneself in it.

In line with the goals of education for the future, it is necessary for the person of the future to be not only efficient but also happy. The goals of education must be focused on training a person who will be flexible, able to reflect on new stimuli and challenges, ready to resolve conflicts, speak foreign languages and ready to live outside his/her close community. One of the predictions that can be achieved is the fact that positive and at the same time formative education increases the school success of students and increases the quality of life of students in school and out-of-school environment. Human health, including that of children and youth, have been incorporated in the state school policy and health policy of the Slovak Republic through the document: Strategic Framework for Health to 2030. It is based on the fact that health is a basic human right, it is the key to social development and the full development of health is possible only in a health-promoting environment, family, work or school.

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Primary Paper Section: A**Secondary Paper Section: AM**

THE PECULIARITY OF R. GLAZAR'S TESTIMONY IN THE CONTEXT OF LITERARY WORKS ON THE SUBJECT OF THE HOLOCAUST

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Abstract: The book *Trap with a Green Fence: Survival in Treblinka* by Richard Glazar is about the testimony of personal experiences of the Jews who survived their own death in the Nazi extermination camps daily. The interpretation of the introduced novels from the point of view of the author's relation to the depicted reality (*genre aspect, literary characters, documentarity, fabulosity*) stands in the centre of the paper.

Keywords: Novel. Holocaust. Author. Narrator. Time. Space.

1 Introduction

Literary works with the theme of the Holocaust and concentration camps are often created against the background of the authors' personal life experiences, reflecting not only individual memories but also the broader context of the time. This interconnectedness of historiography and literature leads the German cultural and literary theorist Aleida Assman to the possibilities of literature "to fill in the gaps in historiography, to show what historians are not interested in and what they cannot deal with for various reasons. A similar attempt in the literature to point out white spaces can be found, for example, in the literary treatment of experience (...) by authors writing about the Holocaust. These authors were convinced that traumatic experiences from the past must not disappear without a trace – their inner need motivated them to tell the story so that the experience would not be forgotten" (Bílá místa kulturní paměti, 2013, p. 66).¹ Although literary works on the subject of the Holocaust are not about the objectification of historical events, they are nonetheless, in a figurative sense, historical documents, thanks to their realistic depiction of the environment, an artistic "testimony" to the morality of society, a particular way of coping with the experienced trauma and brutality². Most of them are "texts that were written after the end of the war – i.e. after the Holocaust period, but they logically stem from it (there is, however, a shift in the time of the events) – they are therefore memories" (Šuša, 2010, p. 197).³ Among such works is R. Glazar's⁴ *Trap with a Green Fence: Survival in Treblinka* (1992), whose aim is "undoubtedly to leave a testimony in the reader's mind – to communicate to them a concrete experience, so that through it they could get to know not only the fates of the witnesses of the event (described in the memoirs), but also the given time, ideology, and philosophy" (Šuša, 2009, p. 58). The

paper will thus attempt to contour the genre specificities of the work but also the peculiarities of Glazar's testimony.

2 The genealogical aspect

As we have already indicated above, in terms of genre, the work belongs to memoir or memoir prose.⁵ Memoirs stand on the borderline between factual and fictional literature (Žilka, 1984, p. 275; Válek, 2013), at the centre of which are events the author himself experienced or witnessed. (Žilka, 2011; Findra et al., 1987, p. 238, Šuša, 2009). Because of this liminal position, the boundaries between memoir and similar genres such as autobiography, historical prose, chronicle, and novel are not always clear. We will thus outline the genre characteristics of memoirs precisely against the background of comparisons. We will rely on dictionaries and encyclopaedic works and the works of I. Pospíšil, I. Šuša, M. Válek and others who have expressed their views on the issue.

Unlike an autobiography, a memoir focuses not only on the author himself, the facts of his life (Jariabka, 2006; Kúchová, 2011) but above all on the surrounding world, experienced events and people they came into contact with (Kúchová, 2011).⁶ Thus, for example, in the first chapter, the personal life of the memorialist is intertwined with the social one; personal experiences are interspersed with brief references to discriminatory legislative measures, degradation and the circumstances of deportation, thus moving from the personality of the narrator-memorialist to the depiction of the environment and time. With his stylised life story, Glazar indirectly creates a self-portrait. (Pospíšil, 1986, p. 28). T. Žilka emphasises the interweaving of personal experiences and social and historical context in this type (Žilka, 1984, p. 318). This circumstance brings these genres closer together and even leads to classifying the analysed work as an autobiographical novel.⁷

Focusing on the past forces us to outline the differences between memoirs and historical prose. We will rely on the views of M. Válek, who derives his considerations from the way reality is depicted in the text, which is understandable since non-fiction and works with a historical theme is primarily based on concrete facts and data (place, precise time, event, famous persons and personalities) (Žilka, 1984, p. 45). On the other hand, R. Bílik perceives the historical genre as a fictional thematisation (authorial fiction) derived from historical fact (Bílik, 2008, p. 41), i.e. the author relies on history but applies his creative invention, verifiable by historical documents. In the case of memoirs, the "generator" of the primary thematic line is likewise "historical fact as part of cultural memory", but it is an effort to portray reality – the experienced – as faithfully as possible.⁸ The author's subjective choice of facts can also lead to gaps in the narrative⁹, but the author deliberately does not fill them in (unlike in historical prose). In general, it is unnecessary to talk about the aspect of truth value in memoirs.¹⁰ The subjective and objective relation can replace the relationship between factual and fictional. The basis of the thematic line is the overcoming of a – commonly known – "life problem situation" and related

¹ Beyond this testimonial value, however, A. Assman identifies greater possibilities for literary creation, since it is she who is „less dependent on the social framework conditions and perceives news that remains outside the current social and political framework, i. e. unnoticed topics or unexplored aspects of historical memory“ (Bílá místa kulturní paměti, 2013, p. 66). It is possible to discuss this opinion even in view of the significant determination of the artistic creation of previous decades by other than aesthetic criteria.

² See, for example: Antoňová, 2022. Also in this context, Ján Gallik, in his study entitled *Motiv smrti v tvorbe autorov slovenskej, českej a maďarskej katolíckej literatúry* [The Motif of Death in the Work of Authors of Slovak, Czech and Hungarian Catholic Literature] (2019), mentions the poetic work about the Holocaust by the Hungarian poet János Pilinszky. The collection *Harmadnapon* (On the Third Day), published in 1959, contains a number of poems that bear a specific indication in their title, i.e. a place and a date, reflecting the essence of the event experienced. In them, the author depicts desolation, loneliness, suffering and transience mainly through the lens of his personal experience of what he calls the "irreparable scandal" of the horrors of the Second World War and especially the Holocaust itself.

³ In literary terminology, we encounter the definition of memoir as a genre of memoir prose. See Válek, 2006, p. 255.

⁴ Richard Glazar (1920 - 1997), real name Richard Richard Goldschmied, was born in Prague. After his high school studies, he worked as a farmer in Poptavi until he was deported to Terezín and later to Treblinka (1940-1942). The work was published in German *Die Falle mit dem grünen Zaun* [The trap with the green fence] (1993).

⁵ Memories and memoirs are often considered synonymous.

⁶ M. Valček considers autobiography a type of memoir literature, an autobiographical novel as a "novelistic transposition of biographical material" (Valček, 2006, p. 30-31), in M. Potemra's typology it is the other way around, a memoir is one of the most famous forms of autobiography (Potemra, 1971, p. 176). P. Liba classifies memoirs and autobiographies as autochthonous biographical genres of literary creation (Liba, 1995).

⁷ We also encounter such a genre classification when evaluating Glazar's work.

⁸ According to D. Mocná and J. Peterka, it is the relationship to reality that is an aspect of distinguishing individual types of memoirs (authentic and fictitious), but on the basis of other features one can speak of monographic (creator-life-work), panoramic (historical connections), fictionalized and mosaic-like (memories) memoirs (see Mocná - Peterka, p. 437).

⁹ The choice of facts is subordinate to the author's intention.

¹⁰ This can be done not only by comparing memoirs with each other on the same subject, but also by comparing them with other sources that in one way or another intertwine with the narrated events. Thus, for example, one can compare the history sketched by R. Glazar (2012, p. 34-35) and the history of Treblinka given by Krákorová and Krákor (2003, p. 115).

personal experiences, the author's attitude to the world and events. The author's statement's authenticity and attitude can be perceived as a subjective fact "oriented towards an open and honest presentation of feelings. It shows that no conventions have value but original perception, personal feeling and understanding. It strives for persuasiveness, (...) it emphasises content, information; it carries its ethos" (Plesník, 2011, p. 54). The uniqueness (authenticity) of the "narrative action formula" in biographical genres (also referring to Glazar's novel) – according to M. Jurčo – can also be evaluated as a particular variant of documentarism (Jurčo, 1999).

The chronological narrative is a common feature of memoirs and chronicles. A chronological sequence of historical events also characterises the chronicle as a medieval epic genre, but unlike memoirs, without deeper contexts (Žilka, 2011, p. 202; Valček, 2006, p. 203; Findra – Gombala – Plintovič, p. 185). The chronicle lacks the author's evaluative aspect. Recording historical facts and events with the application of narrative, fictionalisation of history and entertainment function (which was characteristic, especially in the Renaissance and Humanism)¹¹ leads to bringing the chronicle closer to the genre of memoirs, using the chronicler's method of narration.

Narrativity links memoirs to the so-called narrative (storytelling) chronicle and the novel as the most widespread genre of contemporary prose. Based on the nature of the plot (inclination towards fiction or reality), one of the genre forms of the novel is the novel-in-fact (see Hodrová, 1989, p. 10), whose initial genres are – in addition to chronicle, autobiography, and diary – also memoir (Žilka, 2011, p. 302). In addition to the novel, the memoir is characterised by some of the features of other epic genres: as in the short story, it employs the simplicity of the plot and the linearity of the narrative, the contouring of the characters as in the novella, and the literary treatment of documentary elements characteristic of the feature (Šuša, 2010, p. 202).

The suggested genre overlaps and genre syncretism lead us to the conclusion, also concerning the analysed work, about the appropriateness of Pospíšil's term memoir novel, which he uses to refer to "a huge conglomerate of several types of the novel (biographical, novel chronicle, social, political, philosophical novel)" (Pospíšil, 1986, p. 26).

In addition to hybridity and genre syncretism, which I. Šuša explains by the primacy of the informational function over the aesthetic one, the intention to report, testimony with an emotional effect on the recipient, memoir prose is also characterised by other characteristics such as reflexivity, narrative, alternation of individual and collective (Šuša, 2009, p. 62).

3 The uniqueness of the author's testimony

The title of Richard Glazar's work already indicates the focus of his narrative on a specific period and space. However, in addition to the narrative, going beyond the camp literature and the author's involvement, the problem of the title, of intertextual extra-textual continuity, will form the starting point of our interpretive penetration.

3.1 Addressness and semantics of the work's title

At first glance, the semantic space of the work's title encodes the thematic focus of the narration itself. The name (Treblinka) is thrust to the fore, which despite its euphemistic colouring, evoking something friendly and positive on the outside, is nevertheless easy to decipher. It was one of the extermination camps during the Second World War. In the archive of immediate experiences and memories, Treblinka emerges as "the abyss of history", a "mysterious workshop of death", a "realm of the dead" with a strict camp regime populated by "living corpses" that make it "a place with memory", a place that

contains "the memories of all the beings who found themselves there (their stories often form an important part of the plot)" (Hodrová, 1989, p. 10). However, in the author's literary fiction, the primary meaning is connotatively expanded, activating the idea of Treblinka as a space of death or non-existence. "Once the gates of Treblinka close behind someone, there is no return to life" (Glazar, 2012, p. 23).¹² Explicitly and implicitly, it thus becomes "part of an ingeniously asserted authorial intention" (Plesník, 2011, p. 138). The specific development of the title can indicate other connotations that are revealed only after the reception of the work. The title evokes the idea of something unforgettable, such as, for example, a simple, easy-to-remember text of children's folklore; it can also represent a part of collective memory or manifest the interconnection of individual memories and the cultural memory of a given community or ethnic group. The present documentary testimony demonstrates that the foregrounding of the subject of representation happens through such stylistic qualities as explicitness and implicitness. Although the use of both techniques characterises the work, it is characterised by a degree of increased expressive explicitness, i.e. a tendency towards direct, unambiguous expression or representation (Plesník, 2011, p. 137). Its functionality lies, as suggested by the penetration made, in humanisation and education, and not only about one of the greatest "tragedies of humanity" of the 20th century. Glazar's work is equally directed against all ideologies that dehumanise human dignity.

3.2 From literary fiction to non-literary allusion

Glazar's personal experience translated into a work of art represents, based on H. Markiewicz's "fictional reality", which "depicts the essential features of the structure or laws of the relevant area of the real world" (Markiewicz, 1979, p. 182). R. Glazar thus depicts the period from the signing and aftermath of the Munich Agreement to the period of normalisation. It uses an allusion that directly refers to historical and social events in Czechoslovakia before and after the Second World War. The opening chapter includes the events that precede the novel's plot, and the final part adds further context to the author's life and ends with the author's voluntary exile and the year 1970. "March 1969 – I am leaving occupied Czechoslovakia. We commend ourselves that we must not look back at our family home and garden. 1970 – I leave my Swiss exile and political asylum for Düsseldorf, West Germany, to testify in the ongoing trial" (Glazar, 2012, p. 371). At the same time, the author chooses the diary form as a compositional means to increase the credibility of the epic dominant of his life story. Subjectivity manifests itself not only in the choice of facts but also in the precise dating of those events that foreshadow the problematic situation. "September 1938 – The school year begins normally. At home, my parents listen to Hitler's speech on the radio (...)... March 1939. September 1939. October 1939" (Glazar, 2012, p. 7-9). "The beginning of August 1968. March 1969" (Glazar, 2012, p. 370-371). Although Glazar directly talks about the Second World War and the Nazi regime's devastating consequences, his work is also an indictment of the communist regime in Czechoslovakia. "You live in a large concentration camp, it is an enjoyable concentration camp compared to Treblinka, but still, it is a concentration camp. Moreover, you have a dual role in it. You are locked up in it, and since you are not allowed to torture much, you are a prisoner-tormentor. In the latter role, you are the boarder, and the food is presented to you if you at least quietly walk or ride along. This dual role is all the crueller for you, the more you remember how at that time you condemned for your fate even those who did nothing but turned their eyes away from the scenes" (Glazar, 2012, p. 362). The author thus draws a parallel between the transports and the separation of Czechoslovakia: "Not a living passenger soul anywhere – I am alone on a train from the warlock realm. Nevertheless, I am no stranger to the sorcerer's realm – I recognise it now. A depopulated area, ploughed front fields, barbed wire,

¹¹ I. Pospíšil speaks of the so-called narrative chronicle, which touches on history only "superficially", the emphasis is on narrativity (see Pospíšil, 1986, p. 23-33).

¹² Indeed, Treblinka as an extermination camp has the first place in the number of victims in the short period of its existence (estimated at 730 to 900 thousand in 1942-1943) (Survived the horrors of Treblinka - memories passed on, but tears cannot be unseen, 2012).

watchtowers on the borders. Everything in me rages, sues and curses” (Glazar, 2012, p. 362).

Even considering the author’s assessment of the seventies and the creation of a parallel between the Nazi concentration camps and communist Czechoslovakia (Fafejta, 2004, p. 51), his memories are the “perpetuation” of two traumas, the roots of which are precisely related to anti-Semitism and its exacerbated form¹³. “September 1938 – The school year begins normally. At home, my parents listen to Hitler’s speech on the radio. This suddenly startled me. Every time I get scared (...) I feel something like gunpowder at first.... Mobilisation – that is great – something strange is always going on, there are many people everywhere, and yet they all like each other (...). The professor at school – now deceased – lectures us, he says everything very seriously, and when I have some remarks and aphorisms to my classmates in the classroom, he says to me: »There will be a specific type of people whose pants will be particularly full at this time, and you are one of them« (Glazar, 2012, p. 7). The opening chapter reveals the widening gap between Jews and others, reporting anti-Jewish attitudes and ways of humiliating them. Exhibiting such psychological violence is not expressing fear but is accompanied by expressing nothingness and insecurity due to a lack of information. “8 September 1942 – Here I feel like a money changer, vain and useless; I walk and look around, sit, lie down, wait for food, night and the next day... 12 September – On the evening of the previous day, we learned that we would leave early in the morning. I never really know how or from where, but it always gets to me in time” (Glazar, 2012, p. 12-13).

A significant instance is, at the same time, the contemplating components. Their intention reflects the author’s subjective attitude, but these reflections also represent the “narrative” starting point. “I meet some people down there in the town who also have yellow stars. Why do the older ones keep saying that they are actually proud of it and wear the star with pride? They are just saying that! I know it; I can feel it. As I walk down in the town, reins in hands according to the wagon, I sometimes realise that I’m still covering up the yellow star a bit” (Glazar, 2012, p. 11). Rendering of persecution, the hierarchisation in the social ladder and the discriminatory marking on clothing all raise the problem of ethnic identification. “I look at the inconspicuous people around me, picking out the ugly, squinting, nose-twisting, foot-invading ones, wondering whom I’d swap with and whom I wouldn’t – it’s a good game” (Glazar, 2012, p. 11). Using an allusion to Hitler’s concept of selecting the Aryan race, the author also anchors the problem of human identity. However, he shifts it to an intuitive position. So we can only assume that he does not perceive identity against the background of physiological characteristics but as a phenomenon determined by the experience of the Self and the self-identification of the “I”, which is embedded in broader social relations. Based on the above, personal identity emerges as self-awareness and self-knowledge, but social identity, compared to the previous active principle, represents a passive type of constructing identity as an innate or acquired characteristic. Glazar’s identity is reflected in his knowledge of Jewish traditions (prayers) and his reflection of the basic principles of the Jewish religion, anchored in Deuteronomy (protection of life, the principle of retaliation). As is widely known, ethnicity and religion have become the source of nationalism and discrimination. This negative impact of social identification resonates in Glazar’s reference to the legalisation of anti-Jewish measures, such as the limited admission of Jewish students to universities, in the adoption of a law establishing the wearing of a Jewish label. However, the exclusion of Jews from life – according to the goals of Nazi ideology – was done not only by anti-Jewish legislation but also by stirring up anti-Jewish sentiment in people who were previously unaware of this distinction of “otherness”: “The year 1940 begins. There’s still no plaque on the rink. In the wide oval of skates, I hear the girl in front of me say to the young man she’s hooked into: »I’m looking forward to kicking those Jews out of here for good.« Did

she say that by accident, or did she know I was right behind them? I know them both a little from before when I was still dancing. I went for her a few times too. Hergot, so why did she even dance with me then?” (Glazar, 2012, p. 9). The author verbalises not only the persuasiveness of the Nazi theory of the “depravity” of the Jews but also the use of social mechanisms in their isolation. In this context, we can draw attention to the position of the Polish-British sociologist Z. Bauman, who, referring to the British historian I. Kerschwan finds a connection between hostility or indifference and both deportations and mass liquidations. “The more the Jews were pushed out of social life, the more they fit into the propaganda stereotype. Depersonalisation increased the already existing general indifference (...) and represented a necessary transitional stage between archaic violence and the rationalised ‘assembly line’ of extermination in the death camps. “The final solution would not have been possible without the gradual steps taken to exclude Jews from German society, which took place in full view of the public, in their legal form met with general approval and resulted in the dehumanisation and degradation of the figure of the Jew” (Bauman, 2003, p. 258-259). The thematisation of deportation thus provides a starting point for developing an epic narrative by setting up a situation that thematises the brutality and violence experienced.

3.3 The thematisation of brutality

Brutality and drastic expression are defined as “the focus of the utterance (...) on the depiction of raw, harsh, violent, rude expressions” (Plesník, 2011, p. 245). Glazar also uses the depiction of physical and psychological aggression in the concentration camp, which escalated into the mass extermination of Jews. The ethical dimension of the work is thus intensified by the images of violent practices used by the Nazis, which evoke horror, dismay, and compassion for the victims of violence.

Boundless cruelty and callousness were an immanent part of the camp’s daily regime. After arriving at the concentration camp, Glazar was saved from death by chance. “The report rushes along the line, and an SS man passes me with his cap-boat perched from his forehead. Something slows him down as he almost passes me just runs his eyes over me. He stops, looks over his shoulder at me, and then turns to me: »You come too... You’ll be working here«” (Glazar, 2012, p. 16). The following dialogue with a guard illustrates Treblinka’s harsh reality: “»You« I try with the Vorarbeiter in German, »what is going on here? Where are the others – the naked ones?« »Tojt, ale tojt – Dead, all dead. If not now, then in a few minutes, for sure. This is a death camp, they’re killing Jews here, and we’ve been chosen to help«” (Glazar, 2012, p. 17). Thus, from his arrival moment, Glazar is confronted with the machinery of systematic extermination created as part of Operation Reinhard. His survival strategy is to work and find a solution to escape the hopeless situation. Passive acceptance of fate replaces efforts to break free from it because “they beat the Jew because he allows himself to be beaten and therefore must start beating himself” (Glazar, 2012, p. 218). A witness to Nazi acts fights for bare existence and participates in drawing up an escape plan, which also means his rescue. “2 August, nineteen forty-three. »Revolution – the end of the war!« – the second part of the passport is intended to confuse watchmen. »Hurray! « – at first individually, timidly - I can’t get it out of my chest alone, it rumbles in my throat, now it finally breaks through – hooray! it joins, it grows stronger, a choral hurrah – and through Treblinka sounds a cry that has never come from it before - the cry of a man” (Glazar, 2012, p. 236). It reflects not only the Stoic aspect of ethics, the rejection of passivity but also Guardini’s conception of man based on the unity of opposites – fate (determination by nature and society) and freedom (a feature of human nature) (Dancák, 2011, p. 88). However, as in Nietzsche (Gerbery, 2011, p. 111), this contradiction leads to “evolution”, that is, to the struggle for one’s own nature – freedom. The voice of conscience and altruistic motives in this fight for one’s existence are characterised only as a manifestation of weakness. “And this is the transport from Terezín as I approach the platform; it is full of luggage, and among them, a few people

¹³ Prejudices against Jews as well as regulations governing their status in society have been known since the Middle Ages (see Vargová, 2011).

here and there, the remaining old people. I take her under the arm »Please, where are you taking me?« – Only at the end of the sentence is a sense of defenceless anxiety and concern. »To the lazaret...« So now it has come to me, too – I'll have to lead her all the way inside – (...).Well, you see, you've made up your mind, it's fallen on you, and now you have no choice but to do what you keep thinking about. (...) You'll go in; you won't look at the older woman much; you'll have to bring her close enough to him; you'll kick him between the legs; you'll take the revolver out of its holster – the Flobert rifle with which he shoots so cleanly and quietly now, no, don't take that one. Yeah, it's just that he's too good at keeping his distance, you can't get that close to him, and the watchmen guarding the embankment will shoot at you first anyway. (...) The alley is quite narrow for two side-by-side. In the second bend, I indicate for her to go forward, and when she bends, I suddenly turn around and look back. At the same time, another shot is fired inside.. (...)That's how you got out of that; you ran away from it, from that old one and what he wanted to do. Now enjoy Treblinka for it – the food, the whip, the lazaret. You animal. What are you going to do if you get your own grandmother thrust into your hands?» (Glazar, 2012, p. 55). Glazar's thinking is contradictory, in Bakhtinian terminology "dialectical or antinomic" (Bachtin, 1971, p. 202). The choice between life and death puts the instinct for self-preservation, in contrast to morality and conscience, to the test: to die or to let others die (Bauman, 2003, p. 205). Self-interest to survive even in a given situation overrides moral obligations. The author uses raising doubts about proper conduct to raise some problems (freedom of will and its determination by circumstances), the solution of which he leaves to the reader. What Bakhtin identifies concerning Dostoevsky's novels is also characteristic of Glazar: "It does not arise as a whole reflecting one consciousness which has objectively taken into itself other consciousnesses, but as a whole growing out of the interaction of several consciousnesses, neither of which has become the object of the other wholly; this interaction does not allow the perceiver to objectify the whole plot in the usual monologic way (...) and thus actually makes the receiver a participant" (Bachtin, 1971, p. 216-217).

Escaping from Treblinka to Manheim, Germany, which was heavily damaged by Allied air raids during World War II, meant freedom and a new experience. Glazar does not idealise the presence of the liberation troops in the occupied territory of Germany, but on the contrary, depicts the brutality and cruelty inflicted on women. "Two of the guys who are probably patrolling here happen to come up to us (...); they are said to be both from New York; we pat them on the back, and they also slap Annemarie, well. Then, as if on command, they point machine guns at us, which no longer look like children's toys at that moment. They don't put helmets on their heads; they beat us to the bed with them. One of them stabs Annemarie in the chest with a machine gun until she screams and buckles, then grab her by the hair and drag her to the stairs. The other guy flips a switch, turns it off, and lets a streak of light from a flashlight fall onto the bed, pointing it at us. From the staircase, you can hear moaning and heckling. I barely notice when they take turns. Then the streak of light disappears, boots stamp on the stairs, it is dark, and Annemarie is dragged up into it in silence" (Glazar, 2012, p. 344). The author's literary narrative thus illustrates the destructive power of war, which, in addition to material loss, also brings enormous loss of life, unspeakable violence, suffering and misery to the defenceless civilian population. The post-war years in the author's life have a complementary effect; in the end, they are an expression of satisfaction for the suffering but also an illustration of the character, the cowardice of the criminals, which contrasts with their courage to criminality. "In all the interrogations, I anticipated one outcome with excitement and apprehension. To my great pleasure and satisfaction, it did not happen. None of them stood up, kicked off his heels in a military fashion, cast his eyes straight ahead and declared, »Yes, I did it out of conviction, and I still stand by it today!«" (Glazar, 2012, p. 7).

3.4 Presentation of the author and characters in the work

Based on N. Kraus's typological systematics of the narrator, raising the moral aspect belongs to the peculiarity of the self-portrait of the character-narrator. Glazar's memoir is a personal narrative with a direct narrator who is also the hero of the work. The three categories of author-narrator-hero merge here into one character, which N. Krausová characterises as "a multidimensional character" whose primary concern is to "capture and portray themselves, a certain period of their life, a certain important event for themselves authentically, faithfully, accurately, without any fictitious pretence" (Krausová, 1999, p. 54). In the case of minor characters, the author concentrates on portraying their appearance, looks, and speech or commenting on their actions. To clarify the above, we present the following example: "The head of the orderlies is Captain Kurland, the oldest gravedigger by age and, it is said, by his stay at Treblinka. Behind the round glasses with wire springs, eyes that have seen and understood everything, a small, slightly bumble nose and deep hollows in the round-toothed cheeks that would blend in with the colour of charred dark sand mixed with ash. The whip is always in his way, awkwardly tangled around the wares and the rough pants stuffed into them, and a piece of it is still dragging on the ground. He puts the cap away, and the stubble of remaining greying hair is firm and does not frizz. Captain Kurland lives among the ordinary enslaved people in our barracks at night and in a small booth in the infirmary during the day. When the transports are not running, the SS men are said to go there for a chat. I have never seen them lay a hand on him. None of the bullies in the food "queue" outside the kitchen ever inadvertently bump into him - rather, they make room for him. The greatest gravedigger at Treblinka enjoys the respect of a man and philosopher of ending lives" (Glazar, 2012, p. 90). Such an indirect representation of a character based on external characteristics "directly separates the character from other entities in their environment, thereby helping their identification across the narrative" (Fört, 2008, p. 66). In these static narrative segments, not only the external description but also the role is essential for the "singling out" of characters. This reflects Propp's preferred functional aspect of the character, which is layered the semantics of the proper name. For example, the role of Captain Kurland is imbued with existential elements: he is a symbol of impermanence and death. The aforementioned meaning-forming framework (premonition of death) can also be derived from the character's proper name. The German word "Kurland" as a space of purification, of shedding the cross, could be the ontological status of the "angel of transformation". Death becomes part of everyday life in the camp. From the beginning, the characters of Glazar's prose are confronted with the motifs of human finitude: death as a conscious severing of social ties, death as a violent termination of life, death as a liberation from earthly things, and death as a direction to God. It is the different variations of the death motif that are present in the context of each chapter. Moreover, Glazar is a silent witness to the suffering of his comrades and entire transports. In addition to a detailed description of their cruelty, the author uses the character's nicknames Franz – the Doll, and Mieté – the Angel of Death, to present the opposing characters.

3.5 "Picture atlas" as a source of inspiration

Bible, or "pictorial atlas", as M. Chagal called it, is often an inspirational source of literature for expressing basic ethical questions and Christian principles. This aspect of the moral condemnation of wars also applies to Glazar's work. Through intertextual references to the Old Testament and the transformation of water into blood¹⁴, it emphasises the destructive power of war. "He died of pneumonia; he had suffered a lot during the World War and was prone to it. I remember him telling me that when they were wading through a river in Bosnia and Herzegovina, it was like blood instead of

¹⁴ And Moses and Aaron did so, as the Lord commanded; and he lifted up the rod, and smote the waters that were in the river, in the sight of Pharaoh, and in the sight of his servants; and all the waters that were in the river were turned to blood" (Holy Bible, 2002, Ex, 7: 20).

EDUCATION IS A RETURNABLE INVESTMENT FOR BOTH INDIVIDUALS AND THE WHOLE SOCIETY

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The presented article was prepared in the context of the solution of scientific research projects IGA VŠDTI No. 0002020 Secondary Socialization of Homeschoolers and UAE Gr. 10/29/21 P. SK Aspects of secondary socialization of homeschoolers in the conditions of the Czech Republic.

Abstract: The latest analyses done by the OECD based on many years of experience show very clearly that education plays an important role in economic growth. It has been proved that the last one year of education plus results in an annual production increase of 4–7 per cent per person. It means that raising the share of university educated people in a society is one of the essential conditions for its prosperity even at the cost of introducing tuition fees.

Keywords: Capital investment; education; labor market; qualification; prosperity, society, tuition fees.

1 Introduction

Economic analyses provide relatively convincing conclusions that investment in university education in developed countries is one of the essential factors contributing to the economic growth which is the condition for common increase in prosperity of individual countries. An analysis published by Professor Bano (2015) shows that one year of education plus in the average length of education given to the population of a particular country brings a raised level of economic output by 19% (Europa.1995).

The real return on investment in education without amortization and provided that one school year costs roughly the equivalent of GDP per capita (this is likely to be rather on the high side) is 7% per year, which, from the point of view of public funds investment, represents effectively invested funds.

Economic analyses of the effects of the “new economy”, the economic environment created by the combination of new technologies and mostly university educated staff, show substantially changed characteristics of the Philips curve, which describes the relation between inflation and the rate of unemployment (Beck, 1996). The increase in job productivity in the USA in the 1990s contributed to the natural unemployment rate decreasing by one third. The calculations show that half of this decrease will make a new level of the rate of unemployment due to the long-term economic stabilization. The high degree of interconnectedness between the introduction of new technologies and the need of highly qualified staff causes the disappearance of non-creative and routine jobs. In many cases where a few decades ago a secondary school qualification was sufficient, today a university qualification – a bachelor’s degree as a minimum, is a must. The increase in the percentage share of university educated people in the population is one of the basic requirements for economic growth and the prosperity of the whole society that depends on it. In the long term, a higher qualification means a higher employment rate for all, not just prosperity for those who were successful.

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2 Position of young people on the labor market

The position of secondary school and university graduates on the labor market is strongly related to the overall situation and the development in the labor market as well as economic conditions. Fresh secondary school and university graduates in the Czech Republic, as well as elsewhere in the world, belong among those who are most at risk due to a downward trend in the labor market. Employers are generally less interested in employing fresh secondary school and university graduates because they have mostly little or no experience with particular jobs.

The group most at risk in the Czech Republic is the group of young people under 18 years of age. The reason for this considerable age handicap of young people under 18 is a strong competition of those who left school prematurely. In the Czech Republic, this fact also correlates with the short average time spent in education (ca 15 years in comparison with ca 17 years in developed countries), which means that a lot of young people end up very early on labor market (Chamoutová, 2009). Although they have completed their secondary education, they face considerable risks of being unemployed due to their immaturity and insufficient experience. These handicaps are decreasing with growing age, as cited in Nováček (1999).

The ratio of unemployed secondary school and university graduates to total unemployment is changing cyclically within a year. The highest figure is always in September, when graduates from the previous school year start looking for jobs; the lowest figure is in the spring months, more specifically late in May. The average share of unemployed secondary school and university graduates in total unemployment has been 15% since 1996. The development in recent years has shown a relative decrease in the share of unemployed graduates in total unemployment as compared to last years.

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2.1 Unemployment rates of graduates by completed level of education

The employment of graduates, primarily from secondary schools, is often assessed against the total number of unemployed graduates in corresponding branches. However, this assessment results in incorrect interpretations because the branches regarded as the riskiest are those where the number of unemployed graduates is highest. But one fact is being neglected – these branches also have the highest number of graduates. Their specific unemployment rate can be low. If we want to specify the risk graduates of specific branches face on the labor market, it is necessary to consider both the total number of secondary school/university graduates and their specific unemployment rate.

2.2 Long-term unemployment

It seems to be much more important to take into account the total period of unemployment rather than the total unemployment rate when considering the risks of being unemployed. The ratio of people aged from 19 to 24 years who are long-term unemployed (i.e., more than 6 months) has increased considerably in the last years. Since their position on the labor market has not deteriorated, it seems more certain that this unemployment probably concerns a smaller group of people. In April 2020 the long-term unemployment of graduates in the register of the Labour Office was 59% for apprentices, 56.2% for apprentices who passed the secondary school-leaving exam, 56% for vocational schools' graduates, 47.6% for higher vocational schools' graduates and 49.9% for university graduates. From the point of view of the total number of graduates and youth, the ratio of long-term unemployment is 54.3% for males, with the unemployment rate for females being lower at 52.2% (CZSO, 2021).

2.3 Conclusion

Apprentices with an apprenticeship certificate and graduates from secondary vocational schools are the group most at risk on the labor market. These people are also most affected by long-term unemployment. The unemployment in the case of secondary school and university graduates has a considerably regional character. Regions with higher unemployment also have a higher number of unemployed graduates. The highest figures are seen in the Moravian-Silesian Region, the Ústí nad Labem Region and the South-Moravian Region. The main goal of the educational system is to prepare the students so that they are successful on the labor market and employable. At the same

time, this does not mean that the educational system as a whole should be subordinated to the world of labour. These two areas – the education and the labor market – are more likely in a mutual relationship influencing each other; they are both autonomous to some extent, but they depend on each other. From the research of Lajčín, Porubčanová (2021), it is clear that the ability to adapt, flexibility and cooperation in teamwork is expected for employment on the labor market.

The OECD project dedicated to the macroeconomic conditions of growth has shown a substantial contribution of the length of education to the pace of economic growth. D. J. Johnson, OECD general secretary, expressed it in Bratislava in the following words: "The latest analyses done within the frame of OECD are very clearly and empirically based and prove that the education plays an important role in encouraging the growth. It is necessary to emphasize that a minimum of one year of education plus in a particular country means that a year production per person is rising by 4–7%." (Strategie rozvoje lidských zdrojů v České republice při vstupu do Evropské unie.1999). In particular, it is necessary to emphasize the success of the employment of young graduates, the cooperation of universities with industry (Pesti et al., 2021).

The average time of school education is an appropriate criterion of the level of human resources development in a society and there is empirical data showing that university education gives graduates further and essential competences, and a university diploma is not just an indication of the general capabilities that are independent on the acquired level of education. Our often-repeated doubt regarding the need of university education for a rising number of secondary school graduates is very questionable in relation to the macroeconomic parameters because of a high degree of saturation from the point of view of the number of people studying at a university. The character of university studies is changing all around the world from being elite education for a small part of the population to mass education for half of the cohort within a year. The economic benefits exceeding the individual return for each graduate are ones of essential driving powers of these changes and their political support. According to the last statistics, 45% of the cohort within a year join a university in OECD countries. More than 60% of the cohort within a year study at university programmes in Finland and Sweden, more than 50% in Poland, Hungary, Norway, Iceland, Holland and Argentina, the average value of 45% is exceeded in Korea, the USA, the UK or Israel. In the Czech Republic only 23% of the cohort within the year entered university in 1999, which is the worst published figure among OECD countries, even worse than in Mexico with 24%. One quarter or even one third of the cohort within a year get the first university diploma in 17 OECD countries, whereas in the Czech Republic less than 11% manage to get a university diploma (OECD, 2022).

There are also economic benefits that cannot be neglected. These are direct expenses that the students and their families incur during the study. It also applies to the return on public expenses that seem as a loss at first sight. The fact that the legal system enables Slovak students to study at Czech universities and colleges does not only increase the quality of students and create good conditions for Slovak students to remain and work in the Czech Republic, but it also brings direct economic profit. Considering that the state budget spends roughly 40 thousand Czech crowns on each student per year, the direct expenses of these students at a place of study estimated at 100 thousand Czech crowns per year represent an immediate return on this export function of university study.

3 Noneconomic contributions of university education

Noneconomic contributions of university education are more difficult to quantify than those that can be measured economically. A British study sponsored by the Higher Education Funding Council for England and the Smith Institute provided the following results that have been evaluated mainly for the population aged 33 and adjusted for family influence and

former education influence between birth and 33 years of age. During a 10-year period, university graduates showed more significant qualification improvements than people who did not attend university (a good foundation for further studies is most significantly demonstrated in the use of information technologies, organizational skills and teaching). University graduates show better health conditions. University graduates are less inclined to depressions than people without secondary education. Men who attended university education are less likely to be victims in accidents or violent offences than no graduates. Women who attended university education are in less risk to become victims of domestic violence in the process of relationship break-ups.

Parents who attended university education have fewer problems with their children's education; these children also have more books on average than children of less educated parents. And preliminary analysis indicates that experience gained through university education is sufficient for compensation of former disadvantage in educational sphere. Although there is no substantial difference in election participation, university graduates are more active in civil issues and are less cynic in politics (it does not apply for unsuccessful students). University graduates are more tolerant to gender equalities and less likely to accept racism (without the consideration of a current position). University graduates have more confidence in political processes as compared to the people without university education including high school graduates. These impacts of university education are often neglected in the discussions about Czech universities and too much attention is given to the relevance of completed studies for a specific placement or actual position in the labor market (or in a subconsciously planned structure, which is an idea that is still too often used among people who have a great influence on political attitudes and strategies in education).

3.1 Financing

The quality of a university must be compared with standards of comparable institutions around the world. The reason for that is, firstly, the comparability of the quality of education and the experience gained from attending university. Secondly, from the point of view of competitive abilities which require mobility of academic staff, which should not be limited to trips to universities in wealthy countries. When assessing the quality of financing it is necessary to proceed from international comparisons and measure the expenditures on the university sector with comparable expenditures in developed countries. This comparison is indeed not possible without considering the whole economic capacity and overall possibilities of public finances or private sources for financing.

For comparing university expenditures, it is possible to use mainly two parameters, which are described in connection with the economic possibilities of individual countries. The first one is the portion of expenditures according to the size of GDP in a particular country. A lower level of GDP per person in the Czech Republic in comparison with other developed countries should be the reason for higher expenditures on universities because reaching a higher portion of university education level would in return mean faster increase of GDP and a smaller gap compared to other developed countries. We assume that there is an effect of previous losses in the economy which decreased the actual economic capacity of the whole country and which does not allow to use the required portion of GDP for the necessary investments in university education. This is because a part of public expenditures has to be used somewhere else. It might be possible to accept that the required portion of GDP for the educational system cannot be reached (periodical explanation would say that the economy is growing too fast and its efficiency is too high that we cannot manage the required portion of public finances to be reinvested). In this case, an adequate measurement of comparable expenditures on university education would be the portion of expenditures of the national budget. However, not even here does the Czech Republic perform well as compared to other countries' financing of universities. In the Czech Republic

it accounts for approximately 1.6% of the overall public expenditures; meanwhile, the average figure in OECD countries is 3%. For example, in Austria it is as high as 3.2% (MŠMT, 2022)¹.

The above-mentioned parameters of the amount of total university financing from the budget of the Ministry of Education indicate that universities should get double the current funds so that the average level of financing with regard to the economic situation of the country where the university is located is maintained. The argument of university education being a driver of economic growth would show the need of higher investment from the Ministry of Education.

3.2 Financing of university education within the school system

In 1994, the number of 19-year-old students reached the peak and at the same time the number of grammar school graduates and university students rose as a result of freer environment at universities and their development. In 1990–1994, the financial pressure on university institutions substantially contributed to their restructuring (a similar effect of crisis concerning financing of university institutions could be seen, for example, in Great Britain after 1981 or in Finland after 1993) and to the establishment of new universities as a response to the increased demand for universities studies. After this phase, however, the stabilization of finances did not follow, but there was a permanent decrease of the real level of student funding.

The development of the actual expenditures per one university student in the second half of the 1990s shows that all declarations of education priorities or university education priorities have been completely unrealistic. This is the problem of not only the current government but also the problem of all political parties. No political party in the government offers useful solutions (or it does not take any practical steps) that would contribute to the increase of the university education level that must be achieved. The access to university education is the crucial problem, not the financing of specific institutions; the current situation means that the access is limited in order to make sure that the institutions can be financed from the state budget. The overall number of students during the 1990s was not very impressive as compared to other developed countries.

The long-term deficit in the financing of university education must surely have had an effect on the quality of university education of Czech students. The deterioration of the quality of education will be gradual but concerning the striking differences in financial resources compared with other developed countries, the deterioration will be inevitable. In fact, universities will not be the only victims. Rather, the university erudition and the access of the young generation to education will be the victims. The way the state transformed university education to public institutions contributed to the state getting rid of the responsibility. This is particularly noticeable in the salary increase in state institutions (no matter whether they are regional schools or the Academy of Sciences) where the structure of the salary rates is connected to automatic salary growth. This is in contrast with the access of public universities to financing because the financing parameters do not contain the student-teacher ratio. The salary expenses decide the quality of the academic staff who are willing to work at universities and at the same time determine the number of students who can be taught at our universities. The current salaries are not high enough to

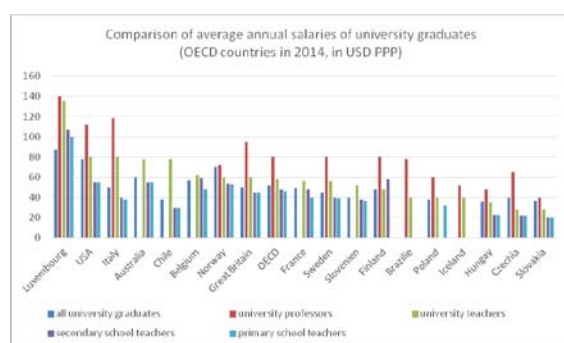
¹ OECD Education in Glance 2016 data: In the Czech Republic, approximately 4% of GDP flowed into education this year, which is one of the lowest figures in the countries whose education systems this study compares. Within the OECD, they allocate a lower percentage of GDP to education only in Hungary, Slovakia and Italy. The OECD average is 5.2% of GDP. In 2013, 0.8% of GDP in our country flowed to primary education, 1.9% to secondary (i.e., secondary schools) and 1.3% to tertiary education (i.e. universities). This issue includes both public and private sources, including international ones. If we take a closer look at primary education, the level of expenditure (0.8% of GDP) is comparable to the surrounding countries – Austria, Hungary or Slovakia. The OECD average is 1.5% of GDP for primary, 2.2% for secondary and 1.6% for tertiary education.

ensure the adequate salaries for university staff and it is no wonder that young people are not willing to work there.

The salaries of Czech university teachers are really very low in comparison with other developed countries². In fact, in nominal terms (according to the exchange rate) in 2014, the majority of the eighteen countries under comparison more than tripled the salaries of university teachers (Belgium, Finland, France and Sweden), quadrupled the salaries (Italy, Great Britain and the USA) or raised them more than fivefold (Australia, Luxembourg and Norway). However, even in less developed countries (South America) with a lower economic level than in our country, the nominal salaries of university teachers are significantly higher (Chile and Brazil). We can thus compare ourselves only with the former communist countries (Slovakia, Hungary and Poland) and with Iceland, where, it must be noted, teachers' salaries have been greatly affected by the recent dramatic economic crisis, after which salaries and wages have fallen throughout the economy. Nevertheless, even in these countries (especially in Poland due to the recent sharp increase in academic staff salaries), the nominal salaries of university teachers are higher than in the Czech Republic, which in 2014 ranked last among all eighteen countries under comparison.

Moreover, the above conclusions are not less striking even if we take into account that the price level in our country is lower (sometimes significantly) than in most developed countries. Even after recalculating the salaries of university teachers according to purchasing power parity (PPP), we remain almost at the very bottom of the ranking of eighteen countries for which comparable data are available (see the following graph). Only Slovakia (USD 26,726 PPP) has a lower annual salary of all university teachers, which in 2014 amounted to an average of 27,693 converted USD (PPP), where university teachers take a slightly higher nominal salary (by 4%), but at the same time the level of consumer prices is higher in Slovakia (by 7%). However, they have a 10% higher salary in Hungary and even significantly higher – by as much as a half (USD 40,862 PPP) – in Poland, where there has been a significant increase in the salaries of university teachers in recent years, when Poland has been doing well economically (see Graph 1).

Graph 1 Comparison of average annual salaries of university graduates (OECD countries in 2014, in USD PPP)



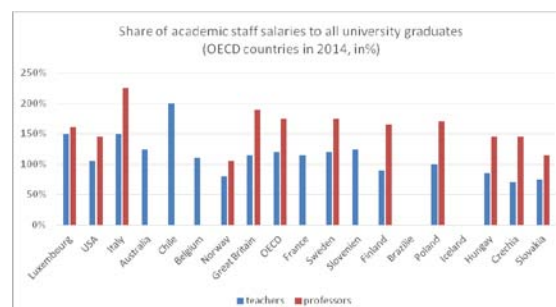
Source: OECD Skills Outlook.2021

The countries are ranked in the chart according to the level of average annual salaries of all university teachers, which are converted into US dollars in so-called purchasing power parity (PPP USD) and thus reflect their real purchasing power in different countries.

² The latest available source of comparable data on academic salaries is the result of a special project and an OECD survey (INES NESLI & LSO Networks). A total of eighteen countries took part in the project and the survey, which focuses directly on comparing academic salaries: seventeen OECD member states – this time including the Czech Republic – and Brazil. The project collected and processed data on the average annual salaries of all university teachers and especially university professors (or comparable categories of academics) from 2013 to 2014 through national statistical databases. In 2015 and 2016, the results of this project were published in the database and in the publication OECD Education at a Glance in the form of an extraordinary supplement to Chapter D3?

However, the low salaries of university teachers in our schools result not only from a direct comparison of their face value (either by exchange rates or purchasing power parity) with the situation in other countries, but also from a comparison of the salary levels of different higher education professions in each country. The salaries of our teachers at all levels of education, including higher education, are below the level of the total average salaries of all university students, which, at least for university teachers, is far from common in the world. Of the eighteen countries being compared, this only applies to the Czech Republic, Slovakia, Hungary, Norway and Finland, and this difference is also the highest in our country (see Graph 2).

Graph 2 Share of academic staff salaries to all university graduates (OECD countries in 2014, in%)



Source: OECD Skills Outlook.2021

The countries are ranked in the graph according to the share of the average annual salaries of all academics to all working university graduates in individual countries.

In the Czech Republic, therefore, the occupation group Teachers at universities and colleges (defined at the third distinctive level of the International Classification of Occupations as ISCO 231) is among the 37 groups of qualified occupations (occupation classes ISCO 1 and ISCO 2) in the median average salary up to the 20th place. At the same time, there are a number of less demanding professions above it, which in many cases are also not performed by employees with a university degree. We will get similar results when we further specify the profession. Among the 250 qualified occupations (ISCO 1 and ISCO 2 occupation classes defined at the fifth level of occupation), Professors at Higher Education Institutions (ISCO 23102) ranked 28th in the median average salary, and Associate Professors at Higher Education (ISCO 23103) ranked 77th, Assistants (ISCO 23104) ranked 184th, Lecturers (ISCO 23106) 226th and Assistants at universities (ISCO 23105) ranked as also as 247th. Of course, they all teach college students today. The fact that the salaries of professors at Czech universities are, in an international and national context, a little better than the salaries of all university teachers have two main reasons. Firstly, the share of professors at Czech universities is lower than in most European countries: while in our country it is about 11%, the European average is about 15% and outside Europe this share is usually even higher. Thus, our professors form a slightly narrower (more exclusive) group of the highest paid teachers, and logically their distance from the overall average is also greater. Secondly, in recent years, the salaries of professors have increased in our country, in contrast to other groups of academic staff.

In conclusion, it is possible to unequivocally confirm that the salaries of academics are relatively very low in the Czech Republic. This is in comparison with the salaries of their colleagues in other developed and less developed countries, as well as in comparison with other qualified occupations in the Czech Republic. However, for our universities, which are a natural part of the global higher education area, this significantly reduces the possibilities of real competitiveness in the international as well as in the national competition for quality academic staff. This applies not only to the acquisition of

prominent personalities from abroad to our universities, but also to the recruitment or retention of the best Czech experts. At the same time, world research has repeatedly confirmed that quality teachers are the key factor for high-quality education. In such a situation and under such conditions, however, it is not possible to expect or even demand from our universities results comparable to the best schools in the developed countries of the world.

3.3 Tuition fees

The substantial increase in the number of undergraduates cannot be done without introducing tuition fees. The aim of the introduction of tuition fees is not only the considerable reduction in the budget of universities that depends on public finances. It is known that tuition fees increase the responsibility of all who are integrated into the study process (university staff, teachers and students) and it also increases the quality of education. It can be expected that tuition fees will help determine the "value of education" with regard to the labor market. Properly determined tuition fees should reflect the "value of a university diploma" on the labor market. Reasonable tuition fees will be also an important motivation factor. A certain calculation of "costs" and expected "effects" will make the choice of university and its study programme more rational. Tuition fees together with teachers' evaluation by students can play a role of an important mechanism of how to distinguish between high-quality, average and below-average teachers. It would increase teachers' mobility among the schools of different levels (Kalous, 2006).

Tuition fees must be accompanied by available students' loans with the possibility to repay them in instalments after receiving an adequate salary. The tuition fee system must not install higher inequalities in the access to university education for children from low-income families. The loans, on the contrary, have to play the role of a tool eliminating unfavourable family environment (low income, low motivation of parents to let their children study, etc.) for those who are strongly motivated to study at university. Together with tuition fees and students' loans, it is necessary to start creating scholarship funds which enable excellent students from low-income families to study at lower costs. In addition to scholarships, a system of social aid budget to help undergraduates has to be formed. It can be easily achieved without high expenses if the current system of overall subsidizing of some student services (hostels, meals, transport benefits, etc.), which is less effective, will be transformed into a system of targeted social aids for those who really need them. All the above-mentioned measures, which will be integrated into the law on tuition fees, loans and social aids for students, should contribute to the diminishing of social inequalities and chances to go through university education. The new law proposal on university financing was rejected in January last year, because of clearly ideological reasons and it means the continuation of public universities budget crisis and also stronger enforcement of other reform elements of higher and university education (rationalization of demand for university study, responsibility of universities towards students, responsibility of students for their study, quality of tuition, etc.).

In current legal system, the main factor restricting the access to university studies is the deficiency of the state budget. Universities cannot offer commercial services and use the profit for subsidizing students who cannot be subsidized by the state. This financing and reinvestment out of university sphere would rapidly cause failing of competitive ability of these services. One of the possibilities how to improve this unfavourable situation of universities is to introduce compulsory tuition fees. The proposals based on the so-called "Australian system" make use of the fact that individual return for graduates is high enough and thus a part of undergraduates can subsidize a broader access to tertiary education. The undergraduates are not obliged to pay tuition fees instalments during their study but the state will ensure their recoverability after the graduates start working and their income is above the average income in the country. A tuition fee of 15 thousand Czech crowns per year might be repaid within a ten-year period. The postponement of the

payment does not bring more money into the monetary system immediately but in the course of a few years the financing of tuition fees could stabilize and add a quarter plus to the total amount of money for university education. This would lead to a considerably increased number of undergraduates especially in bachelor's programs.

Since in the Czech Republic the salaries of university graduates are on average 70–80% higher than salaries of grammar school graduates, the ability of the graduates to pay off the debts resulting from their studies is relatively high. The opponents of tuition fees often argue that some groups of university graduates, especially teachers or doctors, do not reach such levels of income. In this situation, the state has the possibility to intervene and help the graduates in certain professions pay the debts (in other words contribute to the stabilization of graduates' placement in these professions) instead of the global study subsidizing regardless of the graduate retention in an appropriate position. In fact, salaries of Czech teachers are the lowest among other OECD countries in comparison to purchasing power parity or the level of GDP per person. But their real value is a little higher than they are usually said to be. The average salary in the Czech Republic was 25,128 Czech crowns in 2013. Nearly 206 thousand people worked in regional school system, in kindergartens, primary and secondary schools, higher vocational schools, music and art schools or after-school care, and 146 thousand of them were teachers. The sum of salaries was 56.5 billion which means an increase of 0.8% in comparison to the year 2012. The average bonus part of a salary rose from 1,884 to 2,103 Czech crowns. The highest salaries were at higher vocational schools, where they were 29,500 crowns. Teachers at grammar schools and educators in specialized pedagogical centres earned over 28 thousand crowns, teachers at secondary vocational schools earned a little bit less, teachers at primary schools got about 27 thousand crowns. Teachers in kindergartens had some of the lowest salaries, 23,200 crowns on average, but the lowest salaries were in school administration where the average income ranged from 13 to 14 thousand Czech crowns. In private and religious schools, the salaries were 25,200 Czech crowns on average, no pedagogical employees got 18,200 crowns. An OECD analysis (2011) offers one of the few international comparisons (Graph 1) of teachers' costs of lost salary opportunities. Czech teachers' income was among the lowest in OECD countries according to the analysis. Czech teachers who had from 15 to 64 years of work experience got only a half of the income of other university educated people. In other words, the teacher's profession in the Czech Republic is related to high costs of lost salary opportunities due to low salaries compared to other professions. These costs are a little higher in Iceland, Hungary and Slovakia (CZSO, 2021).

The discussions about the introduction of tuition fees would not go against the notion that university education should be an important public good. In a modern society exposed to multicultural environment and a high rate of global effects rapidly influencing local conditions and requiring a smarter response to these changes, the higher quality of education plays an important role in the development of responsible citizenship. Racism and intolerance are easier to overcome with a high level of general knowledge. An educated population is more responsible and less susceptible to political party demagogy. Education is also an important condition for creating equal chances in society, and the whole society will profit from a higher level of university education. The quality of life of the population will improve, people will have better conditions for creative jobs and employment, they will be more informed and more responsible to influence public affairs and will understand better the complexity of modern democratic society administration (Pelikán, 2012).

Even if we do not consider the effect which tuition fees should have on the broader admission to university studies, the other effect of increasing students' motivation to graduate in due time and teachers' motivation to be more responsible to their students as clients of their educational institutions means that tuition fees can help bring about a faster change in the university educational

structure. This seems to be an even more important possible contribution to this change. Students paying for tuition and even the ones committed to future instalments will be more motivated to exert pressure for change of offered study programmes so that they correspond to the real demand for study.

3.4 Conclusion

University education plays an important role in the overall achievement of an individual and the prosperity of society. If we do not deal with these questions in a more complex way, we are likely to create problems in the future which will not hurt the ones who were accepted to university studies, because these people are the most mobile labour force and are willing to leave their countries for more developed ones where they can get good jobs. On the contrary, these problems will hurt the socially disadvantaged and the retirees because it will be difficult to introduce a sound system of financing for them. Developed countries critically depend on an increased share of university educated population. The number of graduates in the more developed countries is twice as big as in the Czech Republic. In the Czech Republic the introduction of tuition fees may be one of the factors that will help remove the barriers to better access to education, but tuition fees can never replace the need for higher expenditures on education. On the other hand, it can help considerably in making effective use of these expenditures, and the total amount of money from tuition fees could represent a considerable contribution to the Czech state budget.

4 Possible trends in the development of university education

Adapting factually consistent and courageous problem solutions in society to fit the political goals only means degrading politics to the technology of power. The sooner the citizens understand the character of such politics and refuse it, the better for them and the future of their country. We are facing a change referred to as the transition to knowledge economy. Based on the latest studies on this subject and experience of the countries where the competitive ability has been growing for many years (Ireland, Finland, the Netherlands), this change significantly raises the importance of human capital and research related to innovative entrepreneurship.

We must admit that after 25 years of transformation, our university education, science and research have ended up in a critical situation. More and more professionals, in contrast with fewer and fewer politicians, become aware of the severity of this situation and its political, economic and social consequences. The problems of university education, science, research and development are either played down or put away with provably populist promises by the leading representatives of political parties. If in the future we want to reach a turning point in the unfavourable development of the Czech economy's competitive ability and stop the outflow of brains, politicians have to radically change their attitudes to the problems of university education, science, research and development. It would not be an exaggeration to say that the decisions related to this area will have key importance for the success of the Czech Republic in the global economy.

Setting favourable conditions for the development of human capital and for the acceleration of innovative cycle in research and development cannot be carried out within the short-sighted policy oriented towards short-term goals. The policy oriented towards the increase in competitive ability is, on the contrary, characterized by the fact that its goals go beyond the time horizon of one election term. However, the experience of transforming countries including the Czech Republic shows that the development of human capital, transformation of educational system, modernization of research system and its funding, transformation of scientific and research institutions and finally the establishment of conditions for the development of innovative entrepreneurship based on the partnership among universities, research institutions and business companies are key factors for the future development, but they are still on the

margin of Czech political interests oriented mostly towards short-term goals (MŠMT, 2022).

The competitive ability of our economy is still very low considering the starting conditions and as compared to other countries. In this regard, in the framework of the OECD countries we come next to last. In 2000 we came 28th out of 29 countries, a drop from the 21st position in 1996. The comparison with Finland, the Netherlands and Ireland is very interesting since their competitive ability is still rising. The common strategic feature of these countries is the orientation of institutions and population towards education, flexibility and adaptability of labour force. In other words, these countries based their successful strategy on the development of human resources and human capital.

Tertiary education in the Czech Republic suffers from chronic shortcomings which can complicate the favourable development of human capital in longer perspective. For many years, the unbearable excess of demand for university education over supply has made the acquiring of university education impossible for a great amount of young people. They could have easily acquired such level of education in other EU countries thanks to their aptitudes. In fact, tertiary education is in contemporary society a prerequisite for good chances for employment and success in life. Statistical data show that the educational structure of Czech population is improving, but much more slowly than in the countries which set out on a way up the ladder of competitive ability. According to the latest data published by OECD, we are gradually losing a relatively good position, whereas countries where the competitive ability has been rising for several years are steadily reaching top positions. From the point of view of educational structure, the group of older people (over 50 years of age) belonged to relatively developed countries, certainly above Ireland and close to Finland and the Netherlands, while the youngest group (under 35) ranks among the poorest countries. But in fact, our main deficit arises from the sphere of tertiary education.

The majority of studies dealing with our educational system and its development after 1989 agree that our system is very inaccessible and highly selective. It applies especially to the university system. Whereas in the countries that set off on the way of economic growth through the development of human capital, the inequalities in the admission to university studies were going down (the Netherlands, Sweden and Ireland), they were rising in our country. When compared to developed countries, the chances of children of diversely educated parents to join university are very low and are getting even worse. According to the latest data, a wider admittance to universities after 1989 has not brought any distinctive change. The main cause of the great social inequalities in the admission to tertiary education is probably the huge excess of demand for higher education over a small supply of study opportunities, together with the inaccessibility of tertiary education. This proves a well-known factor of the application of results of scientists, research teams and institutions in technological progress and innovative entrepreneurship.

The support and development of partnership of private and public sectors are failing. Such a partnership has become the base on which the innovative entrepreneurship is founded. There is a lack of courage to open the door for the co-operation between state subsidized research and technologically oriented entrepreneurship. This is one of the reasons why we are failing to modernize universities and colleges. Modern universities are known to be able to balance the abstract seeking of the truth with the participation in commercial activities and production of economically valuable know-how. The experience of developed countries shows that this situation can be achieved without giving up on the traditional mission of universities. The discussion about the change in the university culture seems to be a taboo subject even for universities and colleges themselves. The representatives of most universities feel that applied research and co-operation with industry is something inappropriate for universities. But it is exactly this co-operation

between universities and business companies where new sources of funding, new opportunities for graduates and in some branches also new trends of research can be discovered.

University education, research, development and innovative entrepreneurship must form a complex of mutually interrelated activities, the main goal (but not the only one) of which is the growth of the competitive ability based on the development of human capital and innovative cycle acceleration. The essential problem is that after years of shuffling around and failing to fulfil political promises, it is necessary to solve the crisis in both the university funding structure and institutional structure, and research and development funding.

According to Čerych (1999), it means namely:

- stopping the decrease in real values of public expenditures on tertiary education and achieving the OECD average (1.1% GDP) of public expenditures on tertiary education;
- approximating the expenditures per undergraduate (ca 5 thousand USD/PPP) as much as possible to the average level in OECD countries (ca 10 thousand USD/PPP);
- accomplishing the university system reform (transformation of higher vocational schools into colleges, creating a hierarchical university education system, a consistent transition to a structured study, a wider space for universities, industry, business companies being active in innovative entrepreneurship co-operation, etc.);
- changing the system of tertiary education funding (strengthening multi-source funding, determining expenditures on university education system in multi-year cycles, introducing tuition fees, student loans, scholarships, and financial aid for students from low-income families, enabling tax saving investment in education, creating a system of innovative entrepreneurship development at universities and supporting the establishment of spin-off firms, etc.).

According to the experience of developed countries, the broadly shaped pyramid of diversely demanding university education cycles is able to much better respond to the demand for university education. For majority of students, the bachelor's degree will become the target education which can react flexibly to the labor market. On the contrary, postgraduate education, provided by research universities, will maintain the continuity of elite education more resistant to job supply changes. Lifelong learning programmes will complete this structure with higher education opportunities which enable elderly people to acquire a university qualification and also continuous updating of knowledge and skills of bachelor's degree graduates with regard to the changing needs of jobs and requalification.

A clear structure of tertiary education study programmes is a necessary condition for the introduction of tuition fees. A student who shares tuition costs must have the possibility to choose between study programmes of different length and between different majors in the course of study. Tuition fees cannot be introduced into the system in which long master's degree programmes predominate. The amendment to the Higher Education Act, which was accepted despite being opposed by the government, sets the principal parameters of the transition to a structured scholar system. This is the first important step in the above-mentioned direction and it opens the door for those who should prepare the law on tuition fees.

In a hierarchical system of higher education, the admission of university applicants must be changed from the existing type of admissions process that uses entrance exams to testing applicants' scholastic aptitudes. This testing should be performed outside of universities and it can be part of a standardized secondary school leaving exam. Universities and colleges can determine different levels of admission requirements for their prospective students, they can require, if need be, further specific testing of skills and talent. It is also important that these specific tests for particular majors (e.g., mathematics, law, languages, etc.) have maximum

standardization and are shared with other universities and colleges. This can be achieved if they are prepared and administered by independent institutions issuing anonymous assessment and with a prior determination of the required pass level for different types of schools and study programmes.

As far as research and development are concerned, all strategically important steps start with the implementation of a much stronger interconnection of research and tuition at universities (especially research universities). Institutional separation of university tuition and academic basic research is an anachronism typical for the communist period, which prevents immediate and secondary effects from influencing on the prosperity of society and competitive ability of its economy. It is necessary to commence without delay the evaluation of current colleges and universities and their profile study programmes on the basis of several criteria (results of the accreditation of branches of habilitation, publishing activity of teachers and impact factors, standardized student evaluation of courses, study programmes and teachers, success in obtaining research grants, number of lectures for foreign students, etc.). The results of such evaluation should serve as one of the main sources for the accreditation process the result of which would be the gradual transformation of high-quality universities into research universities. At the same time, it is necessary to create a legal framework for the transformation of the Academy of Sciences institutes or its professional groups to basic research centres and postgraduate courses, which is a way to create equal conditions for their further possibility to join a group of research universities as institutions focused on advanced studies. The current Academy of Sciences staff will be able to compete with current university teachers.

The consistent differentiation of the university system and the accomplishment of the Academy of Sciences transformation by a gradual integration into newly established research universities are the conditions for the commencement of true scientific schools/universities where the majority of staff will be formed by the young generation who is the most dynamic element in research all over the world. If individual institutions carrying out basic research are not able to integrate their research assignments into university postgraduate, or possibly master's studies, the activity of such institutions financed from the state budget should be principally suppressed. This will lead to the desired competitive environment, weakening of the solutions presented by power, personal or group interests and it will create a more transparent environment for real creative competition and viable development in the country's basic research.

Based on the experience of other countries, it would be good to establish an independent executive body (e.g., the Ministry of Research, Development and Tertiary Education) that would be responsible for funds spent on tertiary education, research and development. Within its authority, this body would ensure co-ordination of research, development, universities and entrepreneurship in the area of innovations and technological development.

A proposed sequence of the main steps:

- accelerate the structurization of tertiary education programmes and achieve the definite predominance of structured programmes as soon as possible;
- accelerate, by means of law, the transformation of the higher vocational school system into institutions providing tertiary education (introduce a credit system, gradually transform some part of higher schools into "colleges of science and technology" providing bachelor's degree programmes);
- using the same law, determine various types of higher education institutions (colleges of science and technology, universities, research universities);
- introduce tuition fees, student loans and a system of social aids, found scholarship funds, prepare and put into practice a system of savings for education subsidized by the state;

- cancel the existing university entrance exams and introducing standardized testing of scholar aptitudes, establish an institution for testing in education;
- pass subsequent laws which would determine the position of research and development, research and development funding and protection of intellectual property rights in research and development;
- by the change in the authority law, establish an executive body (ministry) that will execute state administration in tertiary education, research, development and innovative entrepreneurship;
- by means of a new tertiary education law, besides other things, create space for innovative entrepreneurship of university teachers and students;
- create an effective system of public and private sector partnership, provide tax stimuli for the development of innovative entrepreneurship, create funds for risk business, enable the formation of regional clusters – co-operation between firms, schools and research institutions.

The later we start to put the abovementioned steps into practice, the more we will have to catch up with successful countries and the narrower the manoeuvring space for adequate reform steps we will have. Those who are happy with the current situation will resist is most.

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BODY SHAMING AS A MODERN FORM OF CYBER AGGRESSION

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This study complements the solutions of the research project KEGA No. 014UKF-4/2021 "(e-)Prevention against Cyber-Aggression Observed in Generation Z."

Abstract: The paper deals with body shaming, which is a form of bullying behavior. This is a modern phenomenon in the 21st century, in which the communicator makes disrespectful comments about the physical appearance of the person in question or uses various forms of (cyber)bullying. Body shaming accompanied by cyber aggression is becoming more and more a part of online communication and is as dangerous and distressing for the victim as cyberbullying. Therefore, it is necessary to focus on its elimination. The aim of the present paper is to define the basic principles of body shaming, reactions to it and risks as well as to point out its negative impact and the importance of prevention.

Keywords: body shaming, bigorexia, dysmorphobia, cyberspace, cyber aggression, cyberbullying.

1 Introduction

The process of digitization in the 21st century is present in various areas of our life. It affects our professional life and communication with others. Moreover, it is also transferred to our private sphere and leisure time. The fashion industry has also become indirectly enriched in cyberspace, and gradually began to increase the demands on fashion, lifestyle and regimen. Food has undoubtedly been a basic biological need since time immemorial. However, its perception is changing mainly due to the influence of the media and the image – "body image" they create about it. The influence of the media on judging beauty and so-called "body image" is very powerful especially for young people. The way of life of individuals is also determined by the subjective attitude towards food as well as by the possibilities between what a person really is and their perception of how they would like to be. It is also determined by the fetishization of the current beauty cult. Balancing between these options also determines the relationship to food itself. It concerns both the relationship to food intake and food restriction. It is the restriction of food that is closely related to "the effort to have a slim body" (Marchyn 2019, p. 171), which is currently very widespread.

Confrontation with food restriction has its origins in the ancient past. Deliberately denying oneself food and the resulting hunger was mainly associated with sacral traditions (Deans 2011), which continues to this day in traditional religious culture. Nowadays, due to the influence of the fashion industry, it is no longer about fasting but about deliberately denying the food in order to achieve the desired weight, which is promoted by the media as an ideal.

The implementation of body shaming is also related to culture. Similarly, to other countries, it is also completely natural to make comments on physical appearance in Slovakia. It is so much natural that judging the physical appearance is also reflected in cyberspace, especially on social networks.

The issue of body shaming is at the intersection of several scientific disciplines (Medicine, Psychology, Biology, Informatics, Marketing and Mass Media Communication). However, this topic also extends to Pedagogy, Media Education as well as Social Pathology.

We consider it necessary to draw attention to the fact that the issue of body shaming, similarly to other online threats, must be also addressed from a pedagogical point of view. If a child is a victim of any of the types of online risky behaviour, it affects the whole family and it also significantly determines their school success. Online risky behaviour is often associated with children

and adolescents but may not be exclusively carried out by minors. It can be carried out by children as well as on children. For these purposes, the following typology was processed:

Table 1. Online risky behaviour carried out on children and by children

Online risky behaviour	
Carried out on children	Carried out by children
sharenting	online shame
cybergrooming	cyber aggression
webcam trolling	cyberbullying
cybersex	sexting
luring	hateful behaviour
internet pornography	exclusion
romantic cheating	humiliation
cyber victimization	body shaming and its varieties
blackmailing	mockery
threat	online challenges
phishing	doxing
victim profiling	online addictions
clickjacking	risky use of social networks
electronic illegal trading	trolling
	spam

Each of the listed manifestations of online threats is specific to the process of implementation, intention, and risk. Concerning the risks of body shaming, it can seriously endanger and disturb the child/adolescent's psychosocial.

1.1 Theoretical definition of body shaming

The term "body shaming" was used for the first time by a journalist Philip Ellis (Farrell, 2011). In general, it can be observed that this term includes an assessment of the overall physical appearance, which can be of a positive or negative nature (Duarte et al. 2017). Negative assessment of physical appearance is accompanied by any demeaning comments about the victim's age, hair, food, clothing, or weight, or even by cruelty. It is a purposeful insensitive denigration of a particular person's physical appearance. The aim of body shaming is to point out victim's deficits, features and overall physical appearance in an inappropriate way.

Society dealt with body shaming already in the distant past as people naturally noticed each other. Nowadays, this term finds its place in the field of risky and online risky behaviour. Despite the above, the topic of body shaming is not yet sufficiently studied. As part of a brief historical overview, we can mention that the way of living and requirements for human beauty are directly related to society. In the past, within the cult of beauty ("body image" or "self-esteem"), larger proportions of the body were preferred. Such people were a sign that they lived at a good standard and did not lack the necessities of life, while thinner or emaciated people represented a poorer class that did not have access to food. In the middle of the 19th century, there was a shift from the worship of larger proportions to smaller shapes. It was during this period that the first diet books were published, and even then, diets and sculpted bodies in general were centred on women (Farrell 2011). It can be said that this trend continues to the present. However, more and more men are also starting to fall for this trend.

Negative assessment of physical appearance is usually accompanied by aggression, and therefore it often occurs in parallel with bullying or online risky behaviour (Wasch et al. 2016). If body shaming is carried out as part of bullying, it can also be considered as one of the types of risky behaviour, which is characterized by the fact that it is "the result of the interaction of several factors that increase the risk of failure in the social and psychological sphere" (Labáth 2001, p. 11). Body shaming transferred to cyberspace is a form of cyber aggression or cyberbullying, accompanied by humiliation, mockery, and

insults. Cyber aggression is more general, that is, it does not have to take on the character of cyberbullying. But if body shaming is carried out repeatedly and is accompanied by cyber aggressive behaviour, in that case, commenting on physical appearance can take on the character of cyberbullying. The following are the most common aspects of human body, based on which the aggressor carries out body shaming and about which he/she comments in a disrespectful way:

1. Weight – this is one of the most common reasons why people are ashamed of their bodies. Embarrassing comments can concern overweight (fat-shaming), thinner or emaciated people (skinny-shaming). Comments from others or comments below a photo on a social network embarrass and hurt them a lot.
2. Food - concerning this aspect, regimen, and the food a person likes are commented. Based on this aspect, a particular person is assessed comprehensively. The victim can be praised or shamed, which is also linked to fat-shaming or skinny-shaming. Food photos on social networks belong to a special category that users brag about and are a part of influencer marketing.
3. Attractiveness – commenting on external appearance (pretty-shaming). Body shaming in this context is accompanied by derogatory statements about the (un)attractiveness of the victim. In this approach, body shaming is combined with discrimination (lookism).
4. Clothing - this category is closely related to comments on weight. This is a very common phenomenon on social networks, which is associated with famous personalities, or with individuals who are not above-average well-off. In this case, the victims are attacked or ridiculed, e.g., for the lack of branded clothing, possession of valuable objects etc.
5. Age – discrimination or bullying of people because of their age (age-shaming/ageism). Age derogatory comments often take place in interaction with other components (e.g., hairstyle, make-up etc.), which increases the victim's hurt and shame.
6. Hair – commenting and insulting an individual for their hair or overall hairstyle (texture-shaming).
7. Body hair – these are inappropriate comments by Internet users on parts of the victim's body that, concerning their subjective opinion, should be shaved or not (Resnick 2022).

The attack on the above-mentioned aspects of the human body causes unpleasant feelings in the victim, thanks to which the attitude towards beauty or regimen changes. The female gender is most often discussed in connection with the growing trend of perfect bodies and requirements for physical appearance. It is important to note that men are not indifferent to their physical appearance either. While women struggle with body weight through weight loss, men are usually associated with the opposite process – bigorexia (Gattario et al. 2020), (Frederick et al. 2022).

2 Reactions to body shaming and their consequences

Reactions to body shaming or its consequences vary greatly and are related to the personality of the victim. It includes the fact of how a person perceives himself/herself, what his/her "self-esteem" is (self-assessment, perception of his / her individuality) and how a person can filter the negative evaluation of the environment. An individual in such circumstances can consider whether the bullying has some real basis and will work on himself / herself, e.g., lifestyle modification (balanced and adequate diet, balanced physical activity). It applies to both genders. It should be noted that it is very demanding, especially for adolescents (increased hormonal activity naturally leads to changes in physical appearance, but also in the emotions accompanying puberty).

Negative reactions to body shaming are inappropriate reactions, primarily in eating (Stice et al. 2011). Concerning girls, they can acquire a pathological nature in the form of anorexia – a medical condition accompanied by refusal of food and the addiction to losing weight, or bulimia – abnormal relationship to food and

overeating (Tran et al. 2020). These are eating disorders, which are often discussed by both the professional public and nonspecialists with the aim of education and pointing out the consequences of such behaviour concerning the physical and psychological state of the adolescent. Possible reactions to body shaming are less common in boys. However, we want to pay more attention to them. One of the reactions is "bodybuilding", which is approached as a positive reaction to shape one's body in a thoughtful, appropriate and healthy way. The negative reaction is bigorexia and dysmorphobia, which are associated with unhealthy exercise and abnormal anxiety about one's own ugliness.

Bodyshaming can lead to mental health problems. For example, depression but also anxiety, low self-esteem, feeling of hatred towards one's own body are very common (Ganson 2022). Concerning the victims of body shaming, the denigration of body itself can also cause eating disorders, which take place immediately after a repeated attack by the aggressor. Under the influence of stressful factors that are triggered by long-term humiliation and subsequent stress, an individual can:

1. regularly or suddenly stop eating and this can lead to anorexia,
2. overeat, which can lead to bulimia.

Based on international sources (Fairbun et al. 2003, Duarte et al. 2017, Nikbin et al. 2022, Resnick 2022), we provide our own interpretation of the consequences associated with body shaming:

1. psychological level - with long-term body shaming, feelings of helplessness, reduced self-confidence, anxiety, fear, shame towards one's own person or appearance may appear in the victim. These factors can result in hatred towards one's own body and this in turn can predict depressive states, intense long-term sadness, reduced motivation, loss of interests and the ability to experience joy as well as feelings of emptiness, hopelessness, emotional lability, feelings of guilt etc.,
2. physical level – repeated body shaming and repeated psychological failure can lead to eating disorders in an extreme case. These fundamentally affect the individual and are usually manifested in an inappropriate state of health, e.g., dizziness, stomachache, headache, hair loss and dry skin. In case of overeating, rapid weight gain, blood pressure problems, heart problems and other health problems are very common health problems.

The victim's defense mechanism triggers either (cyber) aggressive behaviour towards the aggressor or life-threatening behaviour for the victim himself / herself, e.g., eating disorders, which are the most common problem. The existing relationship between risky behaviour, specifically the use of addictive substances, and hatred of one's own body or eating disorders has been empirically confirmed (Boswell, Lydecker 2021). Any derogatory comments on physical appearance are very intimate and hurtful, especially if the victim is subjected to indecent behaviour in cyberspace because they suddenly become the center of public humiliation. In such cases, it is possible to talk about digital trauma (Židová et al., 2021). Mental trauma caused by inappropriate behaviour towards the victim in cyberspace is accompanied by the same unpleasant feelings as bullying and cyberbullying (Kopecký et al., 2013). It follows that the victim of body shaming is comprehensively distressed (Laor 2022) and permanently stigmatized. The same is true for bigorexia and dysmorphobia, which appear to be even more dangerous because they overlap to a large extent with depression (Cororve, Gleaves 2001), which has an adverse effect on the victim's mental health (Liu, C., Liu, Z., & Yuan 2020).

2.1 Bigorexia and dysmorphobia as a reaction to body shaming

Individual body shaming reactions such as bigorexia and dysmorphobia are described in more detail in international and

professional psychological literature. Our purpose is to define them in more detail in the following part of the present paper.

If a male individual is subjected to body shaming and humiliated (e.g., because of a thin body), the victim is very likely to mobilize forces to prove his masculinity to the aggressor. The result of this procedure is a gradual weight gain. It is a defensive stance and, at the same time, a response to the reaction of the aggressor. The victim may gradually fall into bigorexia, which is the first reaction of body shaming. Bigorexia, also known as a psychological disorder or the Adonis complex, is a condition in which an individual becomes addicted to excessive and disproportionate exercise. Bigorexia can also be considered one of the types of risky behaviour because it also includes the use of anabolic steroids (Sobotková 2014). Since the individual gradually becomes dependent on physical activity and the substances, bigorexia was included among non-substance addictions in the list of mental health disorders. Concerning bigorexia, the individual is afflicted by obsessive thoughts and beliefs that their appearance is outrageous, and so they must change. Bigorexia begins with inconspicuous workout, which is favourable for a person under normal circumstances. But the dissatisfaction with one's own body drives the individual more and more towards abnormal invented defects (Janková, Runnová 2017).

In many cases, the physical activity can be supported by dysmorphobia, which is another reaction to body shaming as well as a variant of bigorexia. Dysmorphobia, also known as body dysmorphic disorder (Fairburn 2003), is a medical condition caused by a feeling of dissatisfaction with one's own body. An individual spends too much time caring about the imperfections of his / her appearance. Dysmorphobia is also characterized as an abnormal anxiety about the feeling of one's own ugliness (Munjack 1978). The perception of identity in an affected person is significantly defective. Dysmorphia can be very dangerous for the victim if the demands for care or a change in physical appearance are increasing. A person can worry about imperfections that are often invisible to others but complicate his /her life in many ways. Body shaming accompanied by (cyber) aggression arouses feelings of helplessness in the victim, the result of which is the inability to defend against (cyber)bullying. This is accompanied by self-image issues that are strengthened by the aggressor's hateful comments on or off social networks. Self-image is especially important for adolescents, who are the most at-risk group in this context.

Body shaming, including bigorexia, also leads to surgical modifications of the body and face, tattoos and piercings etc. (Sharp, Gerrard 2022). Surgical modifications are reinforced by bigorexia and dysmorphobia, which represent another reaction to body shaming. Social networks are also characterized by the performance of influencers who promote these modifications as "decorations" with which a person can beautify themselves. All this is especially dangerous for pubescents and adolescents who are not aware of the risks of such modifications.

3 Social media platforms and body shaming

Body shaming can be carried out in offline and online communication. Body shaming performed offline mostly represents face-to-face communication, the person is directly exposed to criticism or humiliation. It can also occur as part of bullying, which is strengthened by forms of bullying behaviour and therefore makes the victim even more vulnerable.

Body shaming present in online communication is carried out via the Internet, social networks, etc. The trends related to the appearance are subsequently sharpened especially on the platforms intended for this, e.g., in advertisements or in the sphere of influencer marketing, which is currently the most popular. Body shaming is closely related to influencerism, which is a special form of online threats. It is a modern phenomenon in which an influencer acts as an opinion maker and influences a

certain group of people in thinking, value experience, behaviour, and decision-making.

Body shaming acts in cyberspace with the most vulnerable material - photos. Since photos are also the most visible content on social networks (Židová 2021), we suppose that they exactly lead the aggressor to aggressive behaviour. It is also conditioned by the fact that body shaming cannot be carried out without the aggressor not knowing the victim visually, at least from the photo - her figure, general physical appearance, because this subjectively tells him whether the victim is attractive or not. Based on these qualities, he creates an image of the victim and then evaluates him/her.

One of the most popular and used social networks where body shaming is carried out is Instagram (Laor 2022). It is an application that offers its users several ways to inform others and make themselves visible. Users of social networks voluntarily get rid of their privacy (Kopecký et al., 2013) and thus enable aggressors to carry out body shaming to an even greater extent. Bodyshaming and the cult of beauty are strengthened by the presentation of a lifestyle, often supported by influencers. Exactly they promote the refined lifestyle as the ideal one in relation to human beauty. Most often, it is thinness, that has been promoted by the media for a long time and currently has nothing to do with an ascetic life. The physical side of individuals is also projected into the film industry, where e.g., negative persons are portrayed as stronger or vice versa. All this creates the impression, especially among the youth, that the presented opinions and attitudes towards this issue are correct.

4 Prevention of body shaming

Preventive measures related to body shaming can be divided into the following levels:

1. At the 1st level, it is about creating healthy „self image" and "self esteem". This process begins precisely in the family environment, since the family is the most important factor in the person's life, together with the choice of an appropriate educational style. Parents should know the child's developmental needs on a physical, mental, and emotional level, they should know how to raise the child, to consult a doctor if the child has a disproportionate weight and general physical appearance.
 - a. Parents should avoid comments but look for solutions. This aspect is also related to mental health and healthy lifestyle.
 - b. Parents should be a role model for the child in every area, including lifestyle.
 - c. Monitoring children's online activities is also essential. All this transfers to the secondary environment - the school.
2. On the 2nd level, the school is the secondary factor. The educational institutions follow up with the family or compensate for the shortcomings of family education.
 - a. The school systematically leads children to create the right values and role models.
 - b. Teachers sensitively monitor pupils' expressions and tackle any signs of bullying in the bud.
 - c. The school tries to eliminate or prevent inappropriate behaviour through classes designed for this purpose, or through talks, discussions, lectures, etc.
3. On the 3rd level there are various institutions and communities (psychological, medical, pedagogical...) that create preventive programs/projects. Although bodyshaming is currently less well-known and is rarely mentioned in professional circles as part of the theory of online threats. It must be appreciated that in Slovakia and other countries the attention is indirectly focused on programs associated with World Eating Disorders Day (e.g.: Spolu; Ecinstitut.cz, Inspirante.cz; The Emily Program; Homewood Health and others). The aim of the programs is to raise awareness of the most vulnerable area of mental health and to strengthen an intensive, controlled approach to take care of your body or lifestyle.

Because commenting on the physical body is a very sensitive and hurtful issue, our intention is to point out the importance of this phenomenon to act preventively in this area. One of such projects is the research task of KEGA: (e-)Prevention of cyber aggression in generation Z, where we are involved as co-researchers. The goal of the project is to create the educational strategies aimed at responsible behaviour in cyberspace, prevention and elimination of cyber aggression risks, strategies aimed at developing of the strong characters as a possible prevention of cyber aggression among Generation Z. In this context, the acronym "C.Y.B.E.R." represents the individual areas of the project focused on:

C – cognitization
 Y – self-image/self-esteem
 B – behaviour and socialization
 E – emotionalization
 R – resilience/resistance.

Considering the age, developmental and personality characteristics of children, the project is focused on: the development of character strengths, strengthening of life skills, development of cognitive abilities when working with digital means and the Internet, development of emotional and behavioral abilities, or proposals for practical solving of the individual forms of cyber-aggression through games and activities. As a part of the prevention of cyber aggression, it is very important to focus on the area of body shaming, which is real and very common in both offline and online communication. Under the project acronym "C.Y.B.E.R." bodyshaming can be included in the areas of C.Y.B., in which it is necessary to strive for prevention in the following context:

C - cognitization - the aim is to have a preventive effect on the development of children's critical thinking and lead them to distinguish the fact from fiction, which also includes distinguishing and selecting information in online communication. The field of cognitization in the context of body shaming prevention is also closely related to field Y - self-image/self-esteem - the aim is to help children form/shape their self-image, value themselves, realize their value and accept the fact that "I am the way I am" without difference in age, skin colour, weight, general physical appearance. This area leads to area B - behaviour and socialization - in this area it is necessary to make children aware that they are potentially at risk of any form of cyber aggression/cyberbullying on the Internet. Therefore, it is important to teach them to recognize manipulative techniques and false information in the cyber environment so that they are not influenced by the opinions of others to the extent that they lose their sense of worth. Unconditional acceptance of one's own person, (dis)satisfaction with "how I am" is also reflected in behaviour and actions, and it can significantly determine interpersonal relationships as well.

It is very important that preventive measures (focused on online threats) are also implemented in school, where the youth would be taught by teachers and lecturers that the value of a person does not lie in such adjustments and that not everything that is promoted on the Internet is for a person suitable/healthy. Children and young people are also at risk in cyberspace, where they can potentially often encounter with defamation of their physical appearance. They should know how to prevent bodyshaming, who is the right person to turn to in a delicate situation, or how to deal with criticism, humiliation, mockery.

5 Conclusion

The perception of one's own body or shame about one's physical appearance is associated with a whole range of psychopathologies, including eating disorders (Gilbert, 2002), (Duarte at al. 2017). This is a very current issue, which is increasingly related to younger and younger children. Diversity and otherness, which are becoming a natural part of ordinary schools and classes, underline the justification of this topic in pedagogy. In the practice of ordinary schools, it is therefore

necessary to deal more often with issues related to prevention and education, which leads to the acceptance of differences and tolerance of otherness. The school should thus support the desirable education in the family and supplement it appropriately. Therefore, the most vulnerable groups in cyberspace – children and youth, but also authorities – parents, teachers, psychologists, and other experts should be included in the issue of online risky behaviour (Kurincová et al. 2009).

We approached the issue of body shaming based on a study of international sources with the aim of pointing out the need for education and prevention. The aim of the present paper was to bring the issue of body shaming, including its negative consequences, to both the professional public and nonspecialists, as a part of authors' own contribution to the research of discussed topic, which has not yet received significant attention in Slovakia. We think that the issue in question will gain more importance due to the media pressure on physical appearance that young people are subjected to. We consider it necessary to start solving this modern phenomenon in Slovakia also from a research point of view. We believe that it would significantly enrich a pedagogical research, theory, and practice. For future research purposes, we raise the following open questions for the scientific field:

1. Is there a relationship between a cold emotional attachment of parents and a low self-assessment in a child?
2. Is there a relationship between ostracisation (body shaming) and the fact that a person is ashamed of his / her body?
3. Does the cyberspace functioning of a victim of body shaming differ from an individual who is not humiliated for physical appearance?

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Primary Paper Section: A

Secondary Paper Section: AM

D EARTH SCIENCES

DA	HYDROLOGY AND LIMNOLOGY
DB	GEOLOGY AND MINERALOGY
DC	SEISMOLOGY, VOLCANOLOGY AND EARTH STRUCTURE
DD	GEOCHEMISTRY
DE	EARTH MAGNETISM, GEODESY, GEOGRAPHY
DF	PEDOLOGY
DG	ATMOSPHERIC SCIENCES, METEOROLOGY
DH	MINING INDUSTRY INCLUDING COAL MINING AND PROCESSING
DI	POLLUTION AND AIR CONTROL
DJ	POLLUTION AND WATER CONTROL
DK	CONTAMINATION AND DECONTAMINATION OF SOIL INCLUDING PESTICIDES
DL	NUCLEAR WASTE, RADIOACTIVE POLLUTION AND CONTROL
DM	SOLID WASTE AND ITS CONTROL, RECYCLING
DN	ENVIRONMENTAL IMPACT ON HEALTH
DO	PROTECTION OF LANDSCAPE

WILL WE BE ABLE TO USE RECYCLED PLASTICS OR SHALL WE DECIDE FOR PACKAGING FREE PRODUKCTION?

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Abstract: Recycled plastic and its use are imperative for preserving the environment, including proper plastic wash-out. Will we ever be able to push the Czech population and firms to use recycled material? Or is it happening spontaneously? A questionnaire created on Google Forms involves ten legislative and motivational questions comprising relevant data on the amount of plastic in municipal waste between 2010 and 2020 from the Czech Statistical Office. We found that the population understands the importance of using recycled material and recycled plastic without the government's impulse. Despite the high capital intensity, the state should impose taxes to protect the sustainable environment. We suggest a comprehensive and in-depth survey to acquire more accurate data.

Keywords: Recycling, sorting, secondary raw material, recycling cycle, LCA, PET

1 Introduction

Ecology has recently become the number one topic, seeing all global organizations adopt various climate conventions, including protection against environmental pollution. Industrial zones are the top global polluters, churning out multiple industrial companies and their products – plastic [1]. LCA (Life cycle assessment) involves a reliable method of determining decisive factors behind pollution, using software to evaluate data applied by companies to their manufacturing processes. If the LCA shows spectacular results in cutting oil extraction, why the Czech Republic lags in recycling despite ranking among the fifteen best waste-sorting countries?

Burgess et al. [2] suggest that if domestic waste sorting should factor in better recycling, we must adopt the following four measures: standardization (materials, kerbside collection, waste sorting), investments in the infrastructure, business model development throughout the supply chains and making high-value recycled materials. A nationwide solution to plastic waste disposal heavily depends on preserving the value of discarded plastic, profoundly cutting plastic pollution.

Although the Czech economy offers powerful inducements for using recycled plastic, only companies pursuing ecologic goals have adopted this strategy.

Currently, more than 80% of plastic waste is recultivated or burnt, leaving only 20% for recycling. Such a dramatic loss of precious material causes increased pollution levels, preventing effective plastic waste disposal. Material recycling involves an efficient method of plastic waste recycling, requiring a decent separation technique.

Poor waste plastic recycling has recently been ailing the world, calling for a thorough plastic washout. Enterprises involved in plastic recycling focus heavily on raw materials, where even a small number of contaminants significantly worsen quality ratios of secondary polymers (density, strength, or liquidity), leaving stains or re-granulate [3]. Removing insoluble impurities of various natures demands coagulants and flocculants. Failure to develop a unified theory of using coagulation agents and optimal operating parameters of the secondary water treatment carries excessive consumption of agents with no technological or economic profit. At the same time, most enterprises choose water treatment parameters (agent concentration, temperature, or coagulation time) on an empirical basis. A wise choice of the number of agents allows for maximizing the water treatment effect, meeting the requirements for residual concentration in the

recycled water. The issue of water treatment optimization needs our attention since the coagulants and flocculants depend on various factors. Probabilistic-determinism planning allows scientific optimization of water treatment and eliminates exorbitant agent expenses [4].

Massive media coverage on environmental plastic pollution and a ban on importing plastic waste in some countries have brought the issue to global attention. The EU recycles only about one-third of plastic waste, leaving the rest for energy use and landfilling [5]. Chemical recycling has recently become an efficient method of achieving the EU's ambitious goals, opening new waste streams for recycling, and generating precious raw materials for the chemical industry. Although there is no legal definition of chemical recycling, experts agree that it involves transforming plastic polymers into monomers or chemical elements. Chemical recycling includes techniques like gasification, pyrolysis, liquefaction and solvolysis. So far, the chemical industry has not seen many facilities for chemical recycling. The proposed article suggests various processes on the examples of (previously) operated machinery, assessing their ability to recycle plastic. Only a few plants for chemical recycling are in permanent operation, making any evaluation insufficient for the lack of evidence on ecological and economic benefits [6].

Heavy consumption and non-degradability see PET as a primary source of waste piling up at dumpsites that jeopardize our planet [7]. Efficient chemical recycling methods safeguard the environment by cleaning off dumps, saving natural resources and energy and producing chemical substances with added value as main constituents or side products [8].

Global plastic waste generation has been alarmingly growing for several decades. Traditional landfilling and incineration may cause air pollution and a waste of good soil. Scientists try to recycle plastic waste by mechanical, biological, and chemical procedures to ensure sustainability, from which the latest can transmogrify plastic waste into high-quality products like refinery raw materials, fuels, and monomers. Solvolysis, pyrolysis or gasification are specific chemical reactions depending on a solvent, catalyst, or product [9].

The EU has adopted a circular economy, aiming to regenerate the environment. Italy, the largest European fruit and vegetable LCA exporter, makes shipping boxes from recycled plastic. Tua et al. [10] argue that long-used, returnable EURO pallets would be great for shipping. Schwarz et al. [11] claim that effective secondary plastic recycling needs proper washing and sorting, cutting the European emissions by 73% in the event of the fifteen most used plastics.

Plastic materials are cheap, light, durable, and easy to roll into various shapes and applicable products. That is why its production has increased in the last sixty years. On the flip side, its extensive use and poor disposal harm the environment. Plastic production involves about 4% of the global non-renewable oil and natural gas extraction, and 3-4% ensures energy for its manufacture. Many annually produced plastics go to disposable packaging or short-life products lasting up to one year. The current plastic use is not sustainable. Enduring polymers prevent the decomposition of discarded short-life plastics that rapidly accumulate in biotopes. Recycling can lessen the impact of plastic pollution, imposing remedial measures in the current plastic industry. When performed correctly, it can reduce oil consumption and carbon dioxide emissions and help implement responsible waste disposal. Plastic has been recycled since the 1970s, according to its type and uses in different localities. Recycling packaging materials has recently seen rapid development in many countries. Advanced technologies and data collection systems, sorting and reprocessing recyclable plastic allow exploring new ways of recycling. Joining the forces of the

public, industry, and governments, we can remove most plastic waste from landfills for recycling [12].

Packaging waste is a crucial part of the total European waste. Modern mechanical recycling systems process mainly rigid boxes (e.g., bottles), paying little heed to flexible materials - foil bags. Current technologies of mechanical foil recycling are outdated and insufficient to treat complicated waste left from consumed flexible plastic (PCFP). The resulting poor quality regranulate is then lacking for complex foil material reuse. The presented study explores the technical and economic value of the upgraded mechanical recycling process (additional sorting, hot wash or upgraded extrusion) – PCFP. The successful material application in plastic injection and film production reflects the quality of the four regranulate types. The regranulates rich in polyethylene in the extruded foil is more flexible (45 – 60%), ductile (27 – 55%) and have increased tensile strength (5 – 51%), unlike traditional mechanical recycling methods. Equally, injected samples are more flexible (19 – 49%), ductile (7 – 20 times) and have increased tensile strength (1.8 – 3.8 times). Experts then compare the increased market value and required capital investments, revealing that the upgraded recycling process raises the economic value by 5 – 38%. The study shows how to boost the PCFP mechanical recycling quality and protect the environment, breaking new ground for efficient, unconventional recycling methods [13].

People have recently been thinking about lessening plastic consumption and safeguarding the environment. In the 1980s, nobody thought oceans would be infested with 250 m m³ PET bottles until 2025 [14]. The global society subconsciously save the planet for future generations, considering waste sorting the fundamental thing. However, simple the issue might appear, economic viewpoints raise the devil. Although all municipalities may boast of sorting skip bins, the rest of the process is uncharted waters of eternal landfilling. Waste treatment companies have a cheap way of waste management, recycling only a small number of plastics for research purposes.

The submitted study aims to determine optimal conditions for Czech companies and households to use plastic recycled materials. We fulfilled the objective with the least capital and ecological burden.

We formulated the following research questions:

Can we commonly use recycled materials upon adopting relevant legislation?

How can we push the Czech people to pick a more expensive, yet eco-friendly option over a cheaper and adulterating one?

2 Literature research

Recycling is a continuously established strategy that goes hand in hand with the economic aspects of business [15]. Therefore, the Society of the Plastics Industry has established codes 1-6 for different types of plastics. The given codes facilitate easier unification of plastics recycling [16]. The most widely-used recycling method is chemical recycling. However, this method largely deforms the plastics, which means that the recycled material has a limited range of application. Nevertheless, further innovation of this method and addition of plant fibres in the recycled material could increase its applicability [17].

Global plastics production and consumption has been growing at an alarming rate in recent decades. Similarly, the accumulation of ubiquitous and durable plastic waste in landfills and in the environment has increased as well. The social, environmental and economic problems associated with plastic waste and pollution require immediate and decisive action. The main current recycling processes are focused mainly on mechanical recycling of plastic waste; this process, however, is also constrained by the need for sorting and/or treatment of plastic waste and plastics degradation during this process. An alternative to mechanical recycling processes is chemical

recycling of plastic waste. Effective chemical recycling would enable producing raw materials for various uses, including fuels and chemical materials that could replace petrochemical products.

Chemical recycling is considered an attractive path leading to the reduction of waste and emissions of greenhouse gases, as well as the support of circular economy. In the EU, the readiness for the development of a fully commercial facility is gaining importance due to the ambitious goal of recycling all plastics by the end of 2030. Household packaging flows are usually of worse quality and lower recycling efficiency compared to industrial and commercial packaging flows, and thus require particular attention [18].

Currently, when there is a constant effort to increase the rate of plastics recycling, the “low-hanging fruit” of clean one-stream plastic waste has already been picked. To be able to meet the ambitious European recycling goals, it is necessary to consider also the flows of plastic waste that have been considered “problematic” until recently and have been sent to incinerators. One of such flows is fraction obtained from sorting mixed post-consumer packaging waste using the float-sink method. It is a very complex flow in terms of its composition. It also contains a significant quantity of PVC, which is considered harmful to further mechanical recycling of any mixed plastic waste. For this purpose, The Design from Recycling strategy was used for successful development of a new product with this material called Greentile. This material was successfully produced and turned out to be a useful construction material for pitched green roofs [19].

The recycling of plastic waste is of fundamental importance for reducing the deterioration of the environment and ensuring the future security of resources. The quantity of recycled plastic waste grows every year, reaching 83 % in 2014. However, only 26 % and 4 % of the recycled plastic waste is processed using mechanical recycling and feedstock recycling, while 70 % is processed by through energy recovery (incinerating). Therefore, it is necessary to increase the volume of mechanical and raw material recycling. Plastic waste that cannot be processed by mechanical recycling can be converted to oils and gases by pyrolysis. Nevertheless, polyvinyl chloride (PVC) and polyethylene terephthalate (PET) produce corrosive gases and sublimating substances, which leads to the deterioration of quality of pyrolysis products and damage to the waste processing equipment. In addition to catalytic pyrolysis PET with the use of Ca-based catalysts, the method of PVC dehydrochlorination and dichlorination was developed [20].

Increasing the rate of plastics recycling is of crucial importance for solving plastics pollution and reduction of fossil fuel consumption. However, the problem of technologically and economically feasible methods for recycling post-consumer plastic fractions still remains. Profitable value chains for recycling of mixed films and container-like plastics are nearly not implemented today, which is in sharp contrast to the recycling of relatively pure fractions, such as polyethylene terephthalate and high-density polyethylene bottles [21].

Advanced recycling of plastic waste through pyrolysis and subsequent steam cracking of pyrolysis oils can partially close the cycle of petrochemical plastics production and current end-of-life waste management (i.e. down cycling, incinerating, landfilling). However, the biggest obstacle is the complex composition of actual plastic waste and its contamination by numerous additives and residues. As a result, it is necessary to significantly improve the quality of pyrolysis products compared to fossil feedstock using universally applicable methods of refining and decontamination. These methods range from pre-treatment of waste in order to reduce the halogen and additives content through in-situ methods and practices applied during pyrolysis to post-treatment in order to refine the obtained pyrolysis oils using hydrotreating, filtration, or adsorption. By integration into the petrochemical cluster, it is possible to produce high-quality petrochemical material from plastic waste,

which, when combined with electrification, could lead to the reduction of CO₂ emissions by >90 % compared to incineration, which is currently the most widely used method of waste disposal [22].

The increasing scarcity of resources and growing environmental awareness require a higher rate of plastic waste recycling. The most common methods include mechanical recycling, thermal recycling, and chemical recycling, which is also referred to as feedstock recycling. From these three techniques, chemical recycling is the only method that enables the production of new materials with the quality corresponding to the quality of conventional primary material. However, this technique is applicable to suitable polymers only, such as polystyrene, which can be depolymerised at higher temperatures. For an efficient industrial use, a continuous process is required [23].

The issue of waste remains linked to the development of local communities. The volume of waste stored in landfills affects the quantity of leachate, which results in higher emissions and reduced capacity of the landfill. The main task of waste management is thus to choose the most cost-effective method to minimize the quantity of leachate and emissions and increase the capacity of the landfill, which will lead to the extension of the landfill useful life [24].

Due to the scarcity of raw materials for production of plastics and considering the pollution of the environment it causes, plastic waste recycling is of great importance. Plastics are being increasingly used due to their properties, which have enabled sustainable development of the plastics industry. Currently, a wide range of products are made of plastics, including bottles, panels, sheets, pipes, moulded planks, or structural profiles. Despite these positive properties, developers face frequent resistance in regaining and reprocessing of plastics for using resources and waste depletion [25].

Given the worldwide growing production of plastic products, the technology of waste recycling has been gaining importance in recent years in terms of efficient use of resources and energy savings. One of the advantages of feedstock recycling is that it allows gathering high concentration of monomers that can be reused as crude fuel. Feedstock recycling also includes methods that use the generated gas and residues. Saito et al. [26] identified an increase in the number of technical problems associated with plastics recycling resulting from the growing complexity of the composition of industrial and household waste. On the other hand, it was found that other problems related to feedstock recycling are rooted in political and social systems, although the results varied in the analysed countries.

The ubiquitous use of plastics is also determined by their low price and properties; however, these properties directly challenge the systems of waste management for plastics recycling. Some post-consumer recycling problems are nearly 50 years old, but a large volume of end-of-life plastics are still end up in landfills or other landfilling facilities. With the growing concerns about plastic waste, especially ocean plastics, there is a need to innovate and find alternative strategies to economically convert the plastic waste into a finished product (products) that support its applicability in circular economy. Although there has been identified a wide range of technical strategies for plastics recycling through mechanical and chemical recycling, the commercial use of these strategies is in general constrained either by efficiency, including the large differences in the key indicators, or by economy, where the effectiveness of the product might equal to the effectiveness of virgin materials but the recycling process is costly. Successful treatment of post-consumer plastic waste through recycling will probably depend on economic incentives and government regulations [27].

The global production of plastics from non-renewable fossil resources has grown more than 20-fold since 1964. Although more than eight billion tons of plastics have been produced so far, only a small portion is being recollected for recycling nowadays, and large volumes of plastic waste end up in landfills

and oceans. Pollution caused by the accumulation of plastic waste in the environment has become a problem of global importance. Synthetic polyesters, such as polyethylene terephthalate (PET) are widely used as food packaging materials, beverage bottles, coatings, and fibres. Recently, it has been found that post-consumer PET can be hydrolysed by microbial enzymes under mild reaction conditions in an aqueous environment. Within plastic circular economy, the resulting monomers can be recovered and reused for the production of PET products or other chemical substances without depletion of fossil resources and damaging the environment. Enzymatic degradation of post-consumer plastics thus represents an innovative, environmentally friendly and sustainable alternative to common recycling processes. By constructing efficient biocatalysts using protein engineering techniques, the biocatalytic recycling of PET can be further improved and developed towards their application in industry [28]. Extensive research on recycling of plastics and other solid wastes been conducted mainly in China and other Asian countries. Based on their findings, it can be concluded that plastics recycling and legislation are still incompatible (Wang et al., 2020). The authors state that in these developed countries, mainly electronic products are sorted out, as they are considered to be consumables. However, the authors disagree on determining correct holistic recycling process of plastics, which are considered consumable as well, even more than electronic products. This problem is not limited to Asia; it is a global problem. The authors thus propose to create a joint project that would be binding for all states.

The ever-increasing demand for lithium-ion batteries and their production result in more problems with their disposal. In China, little is known about recycling lithium-ion batteries from consumer electronics, although China is the world leading producer and consumer of this type of batteries. In their research, Gu et al. [29] found that although the respondents are interested and willing to recycle, most of them do not know where the used lithium-ion batteries. According to the research, used lithium-ion batteries are not included in the current collection systems, as only few recycling entities deal with their recycling. Furthermore, Gu et al. [29] found that insufficient supply has a significant impact on today's recycling industry. Based on official statistics, survey results, and the actual performance of recycling plants, it could be roughly estimated that less than 10 % of lithium-ion batteries used in consumer electronics are recycled, with the remaining percentage ending up in landfills or unused.

Bulach et al. [30] found that electro-mobility will play a key role in achieving the set ambitious goals concerning the reduction of greenhouse gas emissions in the transport sector by 42 % in 1990 - 2030. As a result, a significant increase in the sale of electric cars can be expected, and the number of electric cars for recycling will grow accordingly over time. This applies also to recyclable power electronic modules, which are part of all electric cars as an important part of the energy economy. Current recycling methods using car crushers and post-crushing technologies show a high rate of bulk metal recycling, yet they are still associated with high losses in precious and strategic metals, such as gold, silver, platinum, palladium, and tantalum. For this reason, an optimized recycling practice was developed within the project "Recycling of electric vehicles 2020 – key components of power electronics" for recycling electronic modules from electric vehicles, which is applicable even in batch production and which can be implemented using standardized technology. This recycling method is referred to as WEEE (Waste from Electrical and Electronic Equipment) involves dismantling of power electronics from vehicles and its subsequent recycling in an end-of-life electronic equipment recycling facility. This recycling process is economical under current conditions and with the current prices of raw materials, although its costs are significantly higher than recycling using car crushers. The assessment of the life cycle shows basically good results both in the case of using car crushers and WEEE, but the later provides additional benefits thanks to a higher utilization rate and corresponding credits.

The demand for recycled plastics is growing even in the construction industry. At the beginning, research focused only on the possibility of using plastics in the construction industry. The findings showed that by adding plastics, it is not possible to reach the desired hardness and durability of a given product [31]. The results of further research show that the only benefit of adding plastics in concrete and mortar is the reduction of weight, while the hardness and non-combustibility decreased, and the application of plastics thus brings risks rather than benefits [32]. However, the findings of some studies indicate that this material can be used in some developing or smaller economically not independent. As an example, the Philippines can be mentioned, where recycled plastic combined with construction materials enables building a solid shelter, and can be also a sufficient insulator. Thus, even research that did not bring benefits for most of developed countries are helpful in the poorer countries [33].

The rate of utilizing building materials in China is only 5 %, which leads to environmental and economic problems. Researchers from other countries have identified the potential of building information modelling (BIM) in optimizing building material recycling. Zhang and Jia [34] recommend taking other positive measures to solve the problems related to construction waste; if this not happens, other environmental and economic problems will emerge.

With the rapid industrialization and urbanization of China, large volumes of construction waste are produced in the construction sector, which is becoming an increasingly more important problem for local governments that need to ensure sustainable and efficient construction waste management. In general, scientists agree that construction waste recycling is an important means to inhibit the deterioration of the environment in China. Ma and Zhang [35] state that subsidies to construction enterprises are necessary to support construction waste recycling in China; however, compensation to recycling enterprises is not always necessary, as in some cases, if construction enterprises recycle waste, recycling companies will participate in recycling spontaneously, without any subsidies.

Zhang et al. [36] found that a huge amount of construction and demolition waste (CDW) is generated in China. CDW recycling into base materials is a promising method to process this type of waste, with significant environmental and economic benefits. However, this issue has not been adequately addressed yet. Therefore, based on the example of constructing CDW subgrade in Beijing, physical and chemical properties of materials from CDW were analysed. Subsequently, the process of constructing CDW subgrade were presented, and many tests were performed (compaction degree test, observation of settlement, portable falling weight deflectometer test). At the same time, the impact of various thickness of loose paving and cycles of strong vibration on the properties of subgrade was determined. Next, a sorting analysis of CDW particles, a plate load test, and a Beckman beam deflection test were carried out to evaluate the quality of the structure. Based on the results of these tests, technologies of CDW subgrade construction were determined, such as the optimal thickness of loose paving and cycles of strong oscillation. After that, monitoring of post-construction settlement and radar survey for CDW and soil-filled subgrade was conducted to further analyse the applicability of CDW. The results show that recycled CDW aggregate works is applicable, if accompanied by proper sorting and strict construction technologies. Subgrade filled with recycled CDW shows less deformation than soil-filled subgrade. Finally, life cycle assessment (LCA) was performed for two systems of CDW processing with the aim to analyse its benefits for the environment: using recycled material as a base material and direct landfilling. If subgrade is filled with recycled CDW, large volumes of CDW are needed, which may help significantly decrease the impacts of eutrophication and ecotoxicity on the environment.

In many countries, waste management is increasingly more often focused on circular economy, whose aim is a sustainable society

with a lower production of waste, fewer landfills, and higher recycling rate. Waste-to-Energy (WtE) plants, which are focused on converting waste into heat and energy, can be beneficial to circular economy in using the kinds of waste that cannot be recycled. Given the different quality of sorting and socio-economic conditions in individual regions, the composition of waste differs in individual regions, and its future development is uncertain. The composition of waste significantly affects the operation of WtE due to the differences in the energy potential [37].

Plastic is a versatile material that has contributed to many innovations of many products and convenience in everyday life. However, the production of plastics is increasing at an alarming rate, along with the production of plastic waste. Improper waste management leads to release of plastics in the environment, with a lot of negative impacts on ecosystems. Incineration of plastic waste produces excessive greenhouse gas emissions, while plastic as material is consumed and cannot be reused as a resource within circular economy. For this reason, the European Union (EU) is taking measures to increase plastic recycling and is introducing higher recycling targets in its revised waste legislation. Its example is followed by Sweden, which prioritizes measures to improve plastic waste management. It can be stated that the most promising and sustainable scenario of future plastic waste management in Sweden includes high recycling targets in accordance with the EU goals and gradual end to plastics incineration as a method of waste disposal [38].

In the world, recycled plastics are often used in the clothing industry. In spite of this, plastic by-products are still significantly affecting the environment. This is most reflected in the pollution of waste water, where the most microplastics and chemicals from fabric dyeing end up [39]. Fashion companies are well aware of this fact. Therefore, they have undertaken in the Paris Agreement to achieve zero emissions by 2050. The goal of the research by Shitvanimoghadam et al. [39] was to focus on natural dyes and focus on the technology of waste water treatment to prevent microplastics to get into oceans. According to Cook, Halden [40] 50–80 % of waste gets to oceans by recycling. This was confirmed also by the case of chemicals used in recycling. The issue of recycled materials was addressed by Jafari [42] whose main research interest was the analysis of demand for recycled plastics in the clothing industry. According to the author, the issue of plastic recycling is essential mainly in terms of its sorting and cleaning, the costs of which remain very high. The author proposed several solutions, based on which it can be concluded that if companies are supported by subsidies to create cleaning lines, and the price at which the cleaned plastics will be sold is capped, it will bring benefits to everyone [42].

The rapid development of the textile and clothing industry leads to the continuous enrichment of material and cultural life of mankind, but is also associated with the lack of resources, pollution to the environment, and environmental imbalance. On the other hand, with the accelerating pace of modernization of fashion trends, the life cycle of clothes is gradually shortened, resulting in a large amount of unused clothes. In order to mitigate the consumption of natural resources, minimize the burden on the environment, building a “recycling society” cannot wait [43].

Increasing pressure on resources and increasing amount of textile waste are making recycling a clear priority for the fashion and clothing industry. However, textile recycling is still limited, and therefore, it is the focus of upcoming EU policies. As the fashion industry is involved in complex value chains, the promotion of textile recycling requires complex understanding of the existing problems [44].

Knowledge of the origin and production of resources is an important issue for the sustainability of the textile industry. Recycled materials are expected to form a significant part of resources that will be used in the future. Textile recycling, especially post-consumer waste) is still in its infancy, and will pose a great challenge in the future. Better understanding of the

development in the area of textile recycling is hindered by three basic problems: current classification of textile fibers (natural or artificial) does not support textile recycling; there is no standard definition of textile recycling technologies; lack of clear communication of technological progress (from the side of industry and brands) and the advantages of textile recycling from the side of consumer. This may hinder the much-needed further development of textile recycling. Harmsen et al. [44] conclude that there are good possibilities of recycling for mono-material flows within the cellulose, polyamide, and polyester groups. For blended textiles, the outlook is promising for blends of fibers within one polymer group, while the combination of various polymers can cause problems in recycling.

After the Covid-19 pandemic, ecology started to be discussed much more. The European Union is trying to create new regulations and taxes concerning plastics. The first such regulation was to reduce consumer plastics in the food industry, specifically plastic cups, straws, plates. The gradual introduction of regulations and directives shall lead to using the recycled materials mainly to replace fuels [45]. At this time, there is lack of fuels, and in the current energy crisis, their replacement by plastics could mean a benefit in the form of heating homes. Before the pandemic, this was addressed in more detail by Bac [46]. On the example of Turkey, the author performed an analysis of plastics recycling. Turkey has promised zero emissions by the end of 2025. As the basis, it is necessary to create investments in companies that will be financed by the state. Thanks to this, companies can certify the recycled materials, which will guarantee the necessary quality. If this method proves successful, it can be applied in other countries [46].

The last aspect to sorting and use of recycled materials is the motivation of population. In Finland, people who are involved in the project of sorting were offered financial incentives. The majority of the participants (52 %) agreed that finance would be greater motivation than recycling. Abila and Kantola [47] concluded that it is necessary to establish a recycling policy that would specify these rules and there will be no need for financial investments. Khalid [48] conducted a study on citizens' motivation in the form of raffles or discounts for sorting. This study included 1153 households. People were awarded virtual tokens that could be exchanged for goods in raffle or discount on some goods. Although this research was beneficial, it was clear that motivating people is not enough. It is necessary to make decisions now, which provide immediate results, not only to think about whether people are able to do it [49]. Plastics and recycled plastics need to be further analyzed in order to fulfill our obligations to the environment.

Growing environmental concerns caused by excessive use of synthetic materials attracted the global attention to sustainable materials along with the approach of circular economy using recycling. Currently, composite materials are being used enormously in various industries, which results in accumulation of plastic waste in the environment. End-of-life processing of plastic composites is necessary because these materials are not easy to dispose of. The recycling methodologies adopted for polymer composites have two major advantages. First, recycling techniques control the consumption of composite plastic waste. Second, the amount energy necessary for recycling composite plastic materials is relatively low compared to common manufacturing techniques. Thermal recycling is most suitable for recycling carbon and glass fibers. Thanks to thermal recycling, the properties of recycled materials correspond to the properties of original materials, and energy consumption is significantly lower than in the case of chemical recycling. Mechanical recycling, however, has a very low consumption energy for recycling composites compared to other recycling processes. It has thus been concluded that the consumption of composite materials in various industries would only be justified if recycling and reuse of composites were paid equal attention to. Recycling of polymer composites also supports circular economy [49].

One of the biggest environmental problems is currently environmental pollution caused by excessive production of waste. One of the ways to partially eliminate this problem are packaging free shops. Rovnak et al. [49] found that packaging free shops should target their marketing on all generations of consumers and focus on finding suitable ways to increase the level of interest of all age groups.

To make the world more sustainable, participation and cooperation of all market actors (the state, companies, and consumers) is necessary. The new economic model, circular economy, is a concept to achieve sustainability goals. Circular economy and its main principles are based on the idea that all material and product flows can be (after their use) returned to the production cycle so that they become new resources for production and provision of services. In an ideal case, no waste would be generated any more. Packaging free shops are a good example of implementing the principles of circular economy into business practice [50].

Although packaging free shops are popular, disposable packaging still remains an integral part of self-service supermarkets. Sattlegger [51] used ethnographic analysis to prove that food packaging is essential for the functioning of supermarkets. This is in contradiction with the engineering or marketing perspective, which often do not take into account the practical requirements and habitual idiosyncrasies of everyday work processes. Packaging, established as a code of practice, guides everyday food handling in three basic ways. First, packaging is a multifunctional means for presenting the goods to customers. Second, packaging is an indicator and converter for evaluating the quantity and quality of products in the internal logistics of supermarkets. Third, packaging enables control and reproduction of representative characteristics of supermarkets, such as freshness and fullness. As a result, and in order to be successful, strategies for reducing the volume of packaging waste need to better consider the diversity of functions packaging has in work processes. Planners of innovation processes need to consider professional knowledge of workers, the history of packaging, situational distribution of activities, and cultural frameworks of supermarkets.

3 Data and methods

The main data source will be data from a questionnaire survey created using Google Forms. The questionnaire is anonymous and will be distributed on the Facebook profile of company Meta and will also be sent to the author's friends and acquaintances. The questionnaire contains ten questions (1 open-ended question, 2 semi-closed questions, and 7 closed questions). In some questions, it is possible to state own view or experience. The data will be evaluated for 21 days, with the questionnaire being distributed in April 2022. The responses will be evaluated by grouping the resulting data in two groups. The first group will contain responses to the questions related to legislation of plastics sorting. The second group will contain responses to the questions related to personal motivation, willingness to sort out and use recycled materials. The data will be processed in Excel by Microsoft. In the program, three tables will be created, where two of them will evaluate the responses of respondents and the results will be presented in percentage. The third table will evaluate the responses to the open-ended questions. In some questions, it is possible to obtain more specific answers that will be included in the Results chapter. After data processing, pie graphs will be created according to the groups of responses. All results will then be averaged to be able to answer the research questions. Another data source will be the website of the Czech Statistical Office (www.czso.cz). Based on this data source, another table will be created in Excel, which will process the data on sorting out plastics in the Czech Republic for the last ten years, i.e., the period 2010-2020. Unfortunately, the CSO creates only statistics concerning the return rate of municipal waste as a whole, not according to the individual types of waste. Based on these data, the comparison of these evaluations will be carried out. Both documents will be attached to this paper as appendices.

First, there will be used the results that enable direct evaluation of the questionnaire survey. The data will be entered in the created tables in Excel according to the given groups. In the next list, tables with the sum of all data according to the given group will be created. Using the formula for calculating the arithmetic means, the data will be evaluated and presented in percentage. Based on the data, a pie chart will be created, which would clearly show the results that were achieved on the basis of the respondents' reactions.

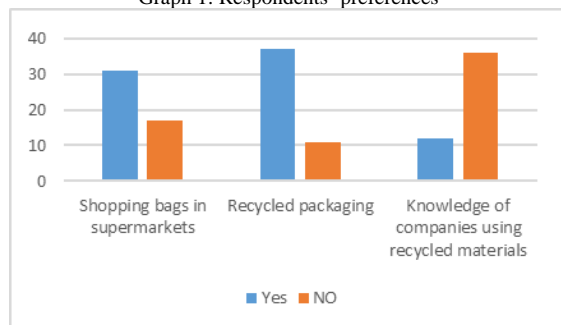
$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i \quad (1)$$

In the case of the second group, a table will be created, where the data on sorting out plastic waste according to the Czech Statistical Office will be entered. These data will be presented in tons. Based on the table, a column graph will be created, which shows the development of plastics consumption in the Czech Republic in the monitored period.

4 Results

Graphs 1 and 2 clearly show that two thirds of the respondents sort out plastics and are willing to make more efforts to return the recycled plastics in the circular economy, although nearly one third of them do not know what happens with plastics after being thrown in the containers. It followed from the responses that people are aware of the existence of recycled materials and even prefer e.g. shopping bags from recycled materials in the shopping markets. The most engaged ones even know which companies sell consumer goods made of recycled materials (8 out of 48 respondents). The most frequently mentioned company was Mattoni and its recycled PET bottles. Other examples included Kofola, EKO-KOM, Puruplast, Adidas.

Graph 1: Respondents' preferences

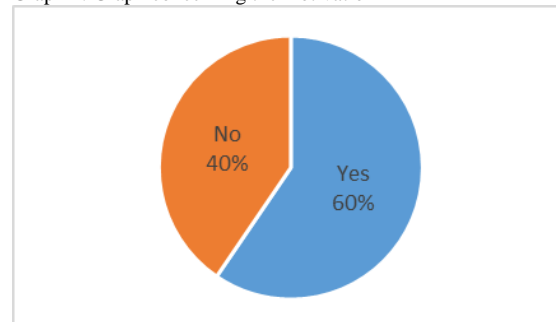


Source: Authors.

In the open-ended question, the respondents could express their views to the issue of plastics and their recycling. It can be said that all responses are connected to each other. Overall, these answers correspond with the research conducted by various scholars [14]. There is a typical response on that it is surprising how much plastic waste can be found in nature, including micro pieces that are difficult to remove. This response is followed by another one where the respondent states that education concerning sorting is still not adequately taught and promoted. There are also responses indicating more accurate and thorough sorting. The respondents who deal with sorting and recycling in more detail provided more professional responses and opinions, such as to choose a more ecological method of cleaning and production of plastics intended for recycling, or not to direct such large quantities of plastics to incinerators. The respondents pointed to the quality of plastic products that can be repeatedly used. As an example, the respondents mentioned a 60-year-old basin that seems to be "undestroyable" compared to some newer ones. Another very common phenomenon pointed out by the respondents is that even if a company has bins for recycling on its premises, the cleaning companies often mix the sorted kinds of waste with others.

The question concerning returning and possible recycling of PET plastics shows that 44 respondents agree with returning. The biggest obstacles can be seen in the points where returnable bottles will be returned. This is confirmed on the case of Slovakia where PET bottles returning has been introduced but not all shops buy them, which is demotivating for many people. The remaining four respondents state that the reason why they do not agree with PET returning is the poor storability of PET bottles. One of the respondents mentioned that washing these bottles is less eco-friendly than making a new bottle.

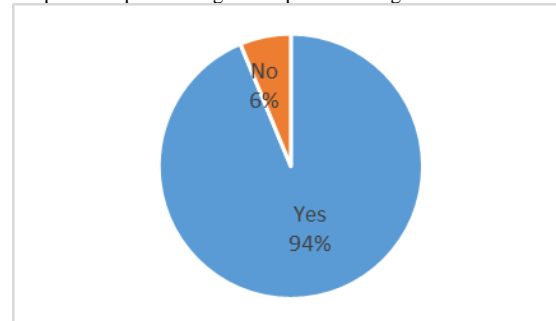
Graph 2: Graph concerning the motivation



Source: Authors.

The data shown in Graph 3 concern the set of questions related to legislation and clearly show that people call for necessary taxation. In the first question, the results show that 43 respondents want companies dealing with recycling or sorting to have established taxes that would motivate them to sort out in accordance with the legislation. The follow-up question was whether companies should use recycled material in its products, and the result was a clear yes. All but one respondent agreed that the government should invest more in recycling.

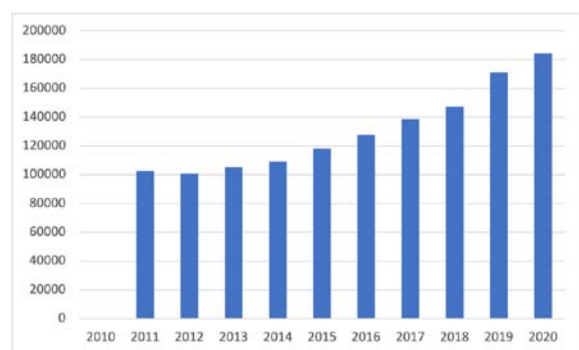
Graph 3: Graph showing the responses on legislation



Source: Authors.

The data from the Czech Statistical Office presented in Graph 4 clearly show that the volume of plastics in municipal waste is growing every year. The only decrease was recorded in 2012. In the years 2011-2015, the volume of plastic waste increased by 3000 tons on average every year. Between 2016 and 2017, the production of plastic waste increased by 9000 tons on average. In 2019, the highest increase was recorded by nearly 24000 tons. In the year 2020, the increase was lower, achieving 13000 tons.

Graph 4: Volume of plastics in municipal waste in 2010-2020 (in tons)



Source: Authors based on data from ČSZO (2022).

5 Discussion

The data obtained enable answering the research questions:

Is it possible to achieve using recycled material on regular basis if legislation is the motivating factor? The state cannot ignore the trend of increasing volume of plastics in municipal waste. The data obtained through the questionnaire clearly show that people would welcome taxes that would promote sorting and mainly using recycled materials in products. Of course, this is not an opinion everybody would agree with. A smaller part of the respondents has a rather negative attitude towards this suggestion, as they do not believe that taxes or recycled materials would be the best solution, as there always be somebody who would not follow the rules.

How to motivate people in the Czech Republic to decide for the more costly but more ecological alternative over the cheaper but non-ecological one? A surprising finding was that people are willing to pay more for ecological products without being motivated by the state or companies. It can thus be concluded that the Czechs are interested in recycling out of their own convictions rather than being forced by legislation; however, almost a third is not aware of how plastics are treated after being sorted out. Returnable PET bottles are considered to be a good idea; however, the respondents expect that without clearly set rules, it will not work. Therefore, none of the respondents uses returnable PET bottles. This can be used for example on the website košík.cz, where it is possible to return the used bottle when ordering. This is, however, conditioned by another purchase, which is what the respondents do not agree with. For now, they consider this to be certain discomfort they are not willing to accept now. It is now becoming known that there are companies that are already using recycled materials to make their products.

Basically, both research questions can be considered answered, because the basis for achieving the goals is to prepare legislation that would motivate companies and persuade people that it is meaningful and important. The Czechs are prepared to fulfil their obligations to nature. The Czech Statistical Office should also consider more detailed statistics concerning plastics recycling because the existing data are too general and have been monitored for ten years only.

The need for creating legislation and taxes concerning recycling was also addressed [52] who state that legislation on plastics recycling must be uniform globally. If only some states will comply with it, the effect of recycling will be minimal, as companies will use the cheaper alternative of plastics disposal in a state where stricter environmental regulations are not introduced.

6 Conclusion

The goal of the paper was to determine the optimal conditions for households and companies in the Czech Republic to use

recycled plastics so that the goal was achieved with the smallest possible capital and environmental burden. The responses from the questionnaire survey showed that the respondents are well informed about the issue and should thus be aware of the fact that the more expensive alternative is important for the conservation of the environment. They are prepared to accept the future capital or tax burden if for a good cause. The goal was thus achieved.

However, it turned out not to be true for all respondents but a solution was found. The government of the Czech Republic should focus on raising the public awareness concerning plastics recycling and using the recycled material. For this purpose, the Czech Statistical Office should monitor more detailed data on plastic waste so that the information for the population is more accurate and targeted. Furthermore, the government should establish effective taxes that would correspond with the goal of the smallest environmental burden possible. Nevertheless, this problem should not be solved at the level of individual countries but globally.

The limitation of this paper is the volume of the data, since the questionnaire was not distributed to many respondents. Another limitation is also the way of distributing the questionnaires where the identity of the respondent cannot be verified. Further research could include a higher number and range of respondents and more comprehensive research could be conducted.

The benefit of this paper is a certain view to plastics recycling expressed by a small number of people who are able to influence other people in their surroundings. The fact that they are interested in this issue and that they are willing to address it enables us to fulfil our obligations to nature without any financial costs of education from the side of the state.

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GASTRONOMIC SPECIFIC ATTRIBUTES OF SARAJEVO TOURIST DESTINATION

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Abstract: The aim of the article was to identify and evaluate gastronomic attributes at Sarajevo tourist destination. The objectives were to: 1) analyse the development trend in hospitality; 2) analyse the structure of hospitality facilities at destination and their spatial distribution, as well as to identify typical catering units represented on the terrain; 3) represent the traditional gastronomy and particular Bosnian & Sarajevo authentic dishes as important part of tourism supply and culture; 4) evaluate gastronomy of destination by 3 categories: tourism managers and employees, and tourists- the visitors. The positive results were found toward the overall satisfaction with gastronomy and gastronomy as a travel motive. Therefore the culinary and gastro-tourism could play an important role in the further tourism development of Sarajevo destination.

Keywords: hospitality & catering, traditional gastronomy, satisfaction, motive, gastronomic and tourism supply, gastro-tourism.

1 Introduction

Hospitality is an important economic activity of Sarajevo, and lately it has been mostly expanding (Žunić, 2018). The number of employees in the hospitality industry has doubled over the decade from over 3,000 to over 7,000 workers (2006-2020).

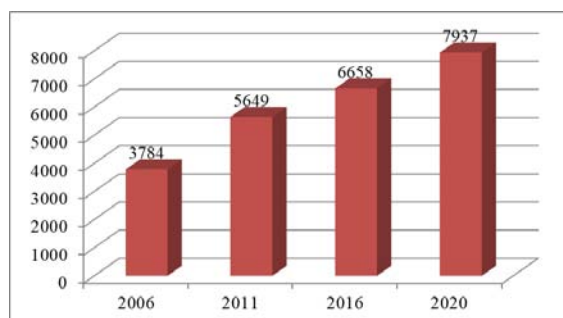


Fig.1 Employees in the hospitality industry (Author; Federal Bureau of Statistics)

Annual indicators of traffic increase in hotel industry and hospitality are positive: the total increase is about 46%, in the field of "accommodation" 60%, and in the field of "beverage preparing and serving activities" 37% (Federal Bureau of Statistics, 2022). Hospitality as well as gastronomy, are the basic components of the tourist reception of the destination. Gastronomy is an elementary, but also an experiential part of the catering (hospitality) and tourism supply. The traditional preparation of food and drinks has a special tourist value, because it is a reflection of the culture of the people and the destination. Gastronomic specialties are served through different types of hospitality facilities, but it is a special experience to taste them in a traditionally preserved environment, such as Sarajevo's Baščaršija-Stari Grad (Old Town). Sarajevo can boast heterogeneous hospitality facilities and a diversified gastronomic supply. Small traditional catering objects (e.g. *čevabdžinice* /kebab restaurants, etc.) are especially attractive to tourists, as well as Sarajevo meat and twisted dishes, which use an ideal ratio of spices adapted to everyone's taste. The rating of the gastronomic supply is very high by tourists and tourism managers, so gastronomy is a significant driver of tourism development in Sarajevo, as well as a stimulus for the development of selective forms of tourism (gastronomic, culinary, manifestational, etc.).

1.1 Theoretical Background

Hospitality is the activity of food preparation and provision of food services, preparation and serving of beverages and

beverages as well as provision of accommodation services. A hospitality facility is considered to be a hospitality business unit which, in business, construction and functional terms, forms a whole or which, within a wider construction whole, has a separate space and the necessary functionality. Hospitality facilities are classified into the appropriate type, and certain types of hospitality facilities into the appropriate category. Hospitality facilities are classified as accommodation facilities (hotels, motels, boarding houses, etc.) and hospitality facilities, cafes, snack bars (Federal Bureau of Statistics). B. Piha stated that the hospitality facilities provide accommodation and meals outside the family, space for contacts outside the apartment, a place for recreation and entertainment, a place for treatment and more. These are mostly accommodation facilities, which can be: hotels, motels, boarding houses, hostels, camps and autocamps, resorts, health resorts and more. These facilities always require special buildings or a group of buildings, an appropriate location and are often combined with activities that take place in food facilities (Žunić, 2018). Gastronomy is the art of preparing, producing, serving and enjoying good food (Britannica). Gastronomy takes place in the ambient space and time, with the application of modern work organization, equipment, techniques and technologies. The basic task of gastronomy is to satisfy the nutritional needs of the population, travelers and tourists. Meals are prepared according to gastronomic principles in specially arranged, built and equipped facilities, spaces and premises. Activity in tourism and hospitality industry through its segments, especially gastronomy, draws on all the existing resources (flora and fauna) of the country, in order to provide quality food to all who occasionally or constantly eat outside their home. Thus, gastronomy in its specificity and attractiveness, along with all other elements, forms an inseparable part of tourism, i.e. hospitality and tourist supply of a particular place, region and country. Approaching gastronomy as a diverse scientific discipline, many experts point out that gastronomy is part of the cultural heritage of the people of the region (Kovačević, 2003). According to sociologist JU McNeal, users of hospitality services in cities, depending on their attitudes towards the type of facility in which they consume products and services, can be classified into the following general profiles: (1) economical users who are guided by price, quality and range; (2) personalized users who take on the relationship and treatment that they have with service staff; (3) ethical users who favor small independent restaurants instead of hotel chains, and (4) apathetic users who care about consuming, no matter where they consume (Lončar, 2005). To this classification are added the so-called users- recreational users who perceive shopping as entertainment and social interaction (Solomon, 1996). According to research in hotel chains in Great Britain and the USA, it has been determined that several profiles of users of hospitality services differ: large customers, hyperemic and local customers. Large customers usually have above-average income and assets, are younger than 45, prefer quality service facilities outside the city center, use services in the late afternoon. Hyperemic users generally do not like shopping, which is justified by the busyness or crowds in restaurants. They often blame facility managers for the range and quality of consumption. They call them reluctant users of catering services. Local users of hospitality services prefer use services in smaller (conventional, classic) hospitality facilities, but consume much more often, spend little and they are usually elderly and in poor financial condition (East, 1997). Kovačević stated that the gastronomic activity is prepared in the kitchen. The main task is the timely preparation and distribution of food, with the application of gastronomic-experiential and scientific methods. According to the type of food preparation, cuisines are divided into: domestic and foreign, classic, national, international, specialized, dietary, vegetarian, etc. Standardization is required for the qualitative and quantitative work (Žunić, 2018). Tojagić and Tešanović stated that quality, health-safe and attractively prepared food in the modern tourism supply could be an important element of the content of offered

services, a strong motive for the arrival of guests and the basis for further development of the tourism supply (Žunić, 2018).

2 Methodology

The paper was based on a qualitative systematic literature research and the fieldwork at Sarajevo destination (area of 5 municipalities: Stari Grad, Centar, Novo Sarajevo, Novi Grad, Ilidža). There were applied terrain observation results toward the gastronomic facilities and its structure, that were supplemented with method of identification of catering units based on the Google Earth Maps. Besides, there were also used available official statistical data from the relevant corresponding bureau offices to get a whole image. The quick survey helped to evaluate the satisfaction with gastronomy supply by the tourism (hotels', tour agencies') managers (20), as well as by tourists- the visitors (137) of Sarajevo (tourists from Middle Eastern countries were dmnt. represented 40%, Serbian 22%, and others: Turkey, USA, Canada, Malaysia, Japan, etc.). Respondents' attitudes were measured at the Likert 3-point scale (excellent, good, bad). Plus, complementary interview was completed with the visitors to understand the gastronomic motive's role in their decision to visit Sarajevo. Besides, the traditional knowledge and local practices helped to complete the research in correlation of its theoretical and empirical nature.

3 Results & Discussion

3.1 Structure of hospitality/ catering objects and their spatial distribution in Sarajevo

Taking into account the East' classification of types of users of hospitality and gastronomic services, the tourist destination Sarajevo has the capacity to successfully respond to all profiles of guest consumers. The structure of hospitality facilities has a diversity from small traditional facilities (e.g. cevabdzinice) to large and modern restaurants of various types. Hospitality and accommodation units in Sarajevo are: hotels, pansion, motels, lodging, hotel resorts, cafe bars, rent-a-rooms, restaurants, pubs, buffets, cakeries, pubs, fast food facilities, canteens, bars, bistros.

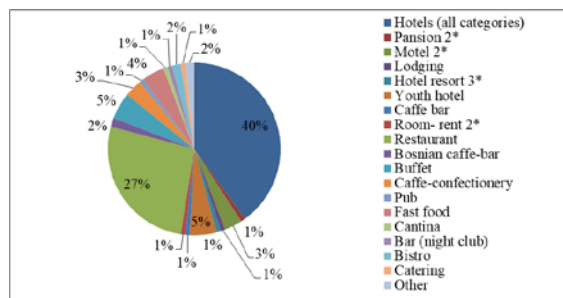


Fig.2 Structure of hospitality facilities in Sarajevo (Žunić, 2018; Bureau for Informatics and Statistics of Sarajevo Canton- ZISKS)

According to the chart of the structure of hospitality facilities in Sarajevo, hotels have a dominant share of 40%, followed by restaurants 27%, etc. It should be emphasized that most restaurants operate within hotel business units.

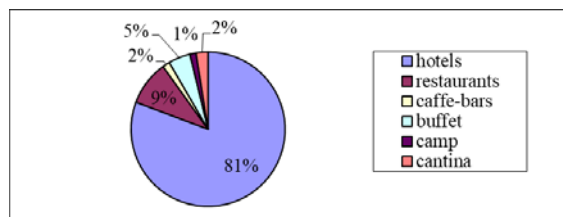


Fig.3 Structure of hospitality traffic by type of facility (Authors' own research results)

According to the chart of the structure of traffic by type of hospitality facilities, the largest share in the total traffic is realized by hotels 80%, because they have the largest traffic of guests since they provide accommodation, overnight stays and restaurant services.

There were identified a total of 246 typical catering objects in Sarajevo: traditional and other food and beverage restaurants 92, pizzerias 37, fast food 32, cevabdzinice 23, buregdzinice 21 and ascinice 6, and cakeries 35.

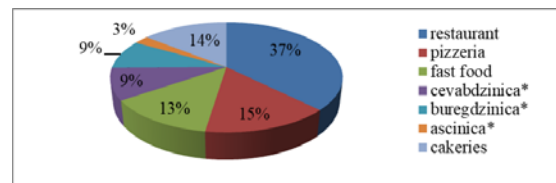


Fig.4 The structure of catering objects at Sarajevo destination with a focus on the facilities of traditional food preparation: *čevabdžinica / čevap-serve; buregdžinica/ burek-serve; aščinica/ traditional Bosnian-oriental food-serve* (Authors' results)

The spatial distribution of the presented catering facilities is quite dispersive. The highest concentration is in the oriental core of Sarajevo- Old Town- Stari Grad 29%, Ilidza 21% and Center 20%. Traditional food facilities (cevabdzinice, buregdzinice, ascinice) are mainly represented in Baščaršija (Old Town)- the most important cultural and historical tourist site. However, a good number of such facilities are in the area of Ilidza, near the geo-traffic terminal and Sarajevo airport- otherwise, a region that has flourished in the last 2 decades, because it is strategically oriented to the development of tourism and hospitality, and has significant tourist attractions, the most important of which are spas, parks and protected areas. CBD zone with large business and market centers (BBI, SCC, UNIS, Alta) has a large number of different restaurants, cafes and cakeries. Restaurants are in the lead in the structure of hospitality and food service units. There are several types of restaurants in the destination: international ("Park prinčeva", "Dom pisaca", "Bar Peppers", "Izvor", "Esmeralda"), national-international restaurant ("Bosanska kuća"), Turkish-Bosnian Restaurant ("Bijeje vode"), Mexican Restaurant ("Hacienda-Cantina Mexicana"), Lebanese Restaurant ("Cita de Bayrouth"), Bosnian and Mediterranean Restaurant ("Blue"), etc. This is a favorable knowledge from the aspect of tourism supply & demand, because in this way it is possible to meet the requirements of guests and tourist clientele (everyone can find something for themselves). The type of restaurant determines the offer of food and drinks- the menu is written bilingually: Bosnian and English, and for some dishes the composition is stated.

3.2 Traffic structure by type of services at catering of Sarajevo

„Most hospitality facilities have a continuous increase in traffic (hotels, camps and other types of accommodation and catering units), restaurants have the most positive development trend, while smaller catering units (bar, buffet, canteens) have regressive traffic growth. Possible reasons are as follows:

- a smaller catering units are endangered by competition from larger business units (hotels, restaurants);
- smaller catering units are eventually restructured into larger business units (expansion and transition to a higher category);
- smaller catering units sometimes cannot resist competition, fall into deficit and shut down.

Hotels make the greatest economic profit, which is logical due to the function of offering food and beverages, as well as accommodation. In the structure of hospitality services, overnight stays and food predominate 80%, while the highest income is from the consumption of hot beverages- teas and coffee“ (Žunić, 2018).

Considering that gastronomy is an inseparable part of tourism, an element of hospitality and tourism supply and part of the cultural heritage of the people and destination, Sarajevo can boast of an excellent gastronomic supply, which is also competitive in terms of price of services. Namely, the offer of food and beverages in international restaurants, as well as other hospitality facilities, is more favorable than in neighboring "capital-city" destinations in the region of SE Europe and beyond. In the offer of food and beverages, a wide range of services has been identified: beer, wine, brandy and other spirits, then fruit juices and other soft drinks, mineral water and soda water, food, beverages, tobacco and matches, other goods and non-goods, as well as overnight services.

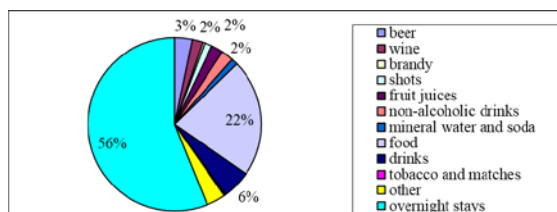


Fig.5 Structure of traffic in hospitality by type of service (Žunić, 2018; ZISKS)

According to the chart of the structure of the total annual traffic by types of services, overnight stays and food together have the largest share of 78% (56% of overnight stays, 22% of food). Significantly lower percentage falls on other types of services, of which mostly on hot beverages (tea, coffee) 6%. Consumption of beer is 3% higher than consumption of healthy beverages - fruit juices 2%, etc.

3.3 Specific characteristics and categorisation of Sarajevo traditional gastronomy

Origin and regional differences of Bosnian gastronomy

Respecting the allegations regarding the method of preparation of meals and the type of cuisine, the dishes of Bosnian cuisine are similar to the dishes of Turkish, Greek and Mediterranean cuisines. Due to the long-term Austro-Hungarian rule, the influences of Central Europe are also presented (Žunić, 2018). However, it should be emphasized that different cultures have shaped Bosnian gastronomy: Turkish-Islamic-Oriental, Austro-Hungarian (Central Europe), Old Balkan (Illyrian), Mediterranean and even Celtic culture, as well as modern processes of globalization (McDonaldization and others). In addition, there are certain regional differences in the names and preparation of the same or similar dishes, which may be influenced by natural-geographical factors and available raw materials, e.g. in central Bosnia (temperate-continental climate) sarma is blanched cabbage rolls with minced beef, while in Herzegovina (Mediterranean climate) a vine leaf is used to prepare this dish (Herzegovinian sarma is called japrak). Urban dishes are richer than rural ones, more complicated preparations and use much larger selection of spices. Bosnian cuisine uses many spices, usually in small quantities. J. Oliver (2011), one of the world's leading chefs, during a visit to Sarajevo and a tasting of traditional Sarajevo dishes, estimated that the ideal ratio of spices is used to please everyone's taste. Most dishes are mild and cooked with a little water. The sauces are almost completely natural. Typical ingredients of Bosnian cuisine are tomatoes, potatoes, onions, garlic, peppers, cucumbers, carrots, cabbage, mushrooms, spinach, pumpkin and beans. The most common spices used are sweet paprika, black pepper, primrose, bay leaf and celery. Milk, cream and sour cream are often used as an addition to Bosnian cuisine. Cinnamon and cloves are added to sweet meals. Meat meals are chicken, beef or lamb. For Bosnian cuisine is specific the preparation of roasted dishes under the baking bell called peka/ sač in the wood & coal-burning oven and embers. Bosnian coffee is served in a „džezva“ (a copper coffee pot) and drink from a „fildžan“ (small handleless cup), with „rahatlukum“ candy (sweet made of sugar syrup).

Salty traditional dishes of Sarajevo

Traditional Bosnian and Sarajevo savory dishes are:

- *Soups*: bey's, okra, tarhana, "kalja" made of potatoes and beef, etc. The representative among these dishes is the Sarajevo soup made of veal cubes and okra.
- *Pies*: burek, buređžici, other pies (made of: cheese, potatoes, spinach or pumpkin), kljukuša, popara, etc. The most famous Bosnian pie is burek- meat pie baked under bell/ sač, made of flaky dough known as phyllo (or yufka) filled with minced beef meat (main additional spices to the meat are: onion and bieber (black pepper)).



Fig.6 Bosnian burek- meat pie under the baking bell/ sač at Baščaršija (CA/ Author's Collection)

- *Grilled and barbecue meat dishes*: ćevapi, šiš-ćevap, sitni ćevab (small kebab), ražnjići (veal skewers), janjetina na ražnju (grilled lamb), veal under the baking bell, etc. The representative is "Sarajevo ćevapi" (small kebabs- cylinder shaped) made from minced beef and spices (mainly onion and black pepper), and served in flatbread- somun (the Bosnian pita bread) with a side portion of raw onions. J. Oliver (2014) included them on the top list of ideal meals in the world. He also published his culinary recommendations for the World Cup in Brazil, on whose list Bosnian ćevapi took a special place, because the dish is delicious, high in calories, with specially prepared meat and it is quick to prepare.



Fig.7 Sarajevo' ćevapi in somun-bread with raw onions at Baščaršija (Author's Collection)

- *Dolma, sarma and similar dishes*: sogan dolma, sarma, ćufte, sataras, keške, bosanski lonac, etc. Bosanski lonac (Bosnian pot beef stew) is an authentic bosnian dish, which

is baked in an earthen clay pot for 5-6 hours on low heat. It contains quality beef, potatoes, red onions, a few snap beans, carrots, parsley, celery, tomatoes and apple cider vinegar.

- *Moussaka* - a typical example of moussaka is made of potato, beef and eggs.
- *Pilav*. Typical examples are: rice pilav, bulgur pilav, pura, cicvara, etc. Pura is a very high quality dish, which is made from corn polenta.
- *Breads*. Typical examples are: somun, pogača, maslenica, etc. Holiday breads are: somun with ćurekot (black seed) among Muslims; hala at Jews; Christmas and Easter bread for Christians. "Bosnian bread is historically known as Bosman, which was made during the Austro-Hungarian Empire" (Jašić, 2009).
- *Chimburi* - a typical example is a chimbur (poached egg) with a leek.
- *Salads*. Typical examples are: roasted paprika salad, sour cabbage. "Salad called Bosnian aphrodisiac is made from shredded celery and beet" (Jašić, 2009).

Sweet traditional dishes of Sarajevo

Traditional Bosnian and Sarajevo sweet dishes are:

- *Zahlade (Cold deserts)*. Typical examples are: ashura, sutlija (rice pudding), apple jam, bestilj (plum jam), etc.
- *Cakes* - typical examples are: baklava, tufahija, hurmašice, ružice, lokumi, kadaif, jabukovača (apple pie), etc. "Bosnian tufahija was declared the best delicacy at Palermo, Italy" ("Magazine Hotel" Europa "Sarajevo). Tufahija is a refreshing dessert made from boiled apples filled with steamed walnuts, served in its agda (syrup) and with cream topping.



Fig.8 Traditional Bosnian coffee ft. rahatlokum, and tufahija dessert at Morica Han, Bašćaršija (Author's Collection)

Traditional drinks of Sarajevo

- *Traditional drinks*. Typical examples are: djul sherbe from autochthonous rose of intensive rose colour- đulbešećerka, mevlud-sherbe from cinnamon and cloves, spruce sherbe, homemade elderberry juice, "shira"- freshly squeezed apple juice, boza, mead, brandy, yogurt, buttermilk, Bosnian coffee.

Traditional bosnian brands & products at Sarajevo destination

Beside traditional dishes and drinks of Bosnian cuisine, touristically important are the authentic and traditional Bosnian agricultural food products and processed products:

- *Milk and dairy products*. Recognizable indigenous brands of milk are: whey, Travnik and Livno cheese, which are part of the breakfast menu in Sarajevo hotels

- *Meat, mixtures and processed products*. Typical examples are salted and smoked beef meat products: Bosnian sudžuk, pršut (prosciutto), etc., served as a "cold plate" for guests, and also popular export brands, which can be found on the European market, etc.
- *Fruits, vegetables and processed foods*. In Bosnia and Herzegovina, there is a rich wealth of valuable varieties of fruits and vegetables that have been preserved in indigenous forms. Old varieties of apples (senabija, petrovača, lederica) are in demand both for consumption and for the preparation of apple jam, shira-juice, apple vinegar, brandy, and drying. Plum- Požegača, etc. are a product for which Bosnia and Herzegovina was once recognizable in the world and by the economic stability of families in rural areas that was based on the production of prunes and other products. Plums still carry significant potential in the development of typical Bosnian products due to their technological, nutritional and biological properties. Typical examples are: prunes, plum brandy, plum pie, bestilj, etc.
- *Spicy and aromatic herbs, forest fruits*. "Over 5,000 species of vascular plants are known in Bosnia and Herzegovina, 450 are endemic" (Redžić et al., 2008). "Significant gene pool in BiH is contained in various forms of roses: đulbešećerka; dulhatma; rutica rejhan or basil; šekaik or peony; šeboj and many others. The most important aromatic and medicinal plants sold in Europe, which are available in BiH, are: valerian, wild chestnut, St. John's wort, mint, hawthorn, melissa, nettle, chamomile, etc." (Jašić, 2009). "The vegetation of the Sarajevo Canton consists of 300 phytocenoses distributed in 80 vegetation associations, 50 rows and 30 classes. These data indicate an extremely high degree of richness and diversity of the plant world" (Đug et al., 2008). In addition, forest and berry fruits (strawberries, raspberries, blackberries, currants, blueberries) grow in the Sarajevo mountains in the immediate vicinity (Bjelasnica, Igman, Trebevic, Treskavica, etc.), and are widely used: fresh consumption, preparation of local jams, juices and compotes, cakes and sweets, syrups and medicinal preparations, sales on the local market, but also export to European countries, because these fruits are highly valued for their health benefits and pleasant taste.

3.4 Evaluation of Sarajevo gastronomic supply

The gastronomic supply of Sarajevo has an excellent rating of over 100 tourists and over 50 tourist managers (Žunić, 2018). Traditional Bosnian dishes are mostly high in calories and meat, while for tourists in spa hotels- spa (e.g. Iliđža) there is a customized program of healthy food. There are also themed restaurants with specialized vegetarian food in the destination (restaurant "Karuzo", fast food "Veggae"). A large number of restaurants also have a halal certificate (e.g. hotel groups Europa, Iliđža, Hotel Boutique Bristol, etc.), which basically means that pork and alcohol-based meals and drinks are not prepared or served. Sarajevo's food and beverage offer has been proven to attract tourists from the region and Europe and beyond. An informal interview with about 30 transit tourists from the Balkan region (Serbia, etc.) made it possible to learn that "ćevapi" are the main motive for visiting Sarajevo, which further confirms their high position on the list of ideal world dishes. The Bosnian tufahija won first place in front of the Europa Hotel and won an award at the Cannolli & Friends International Cake and Culture Festival (2010) in Palermo, Italy, in a competition of fifteen countries. The jury was delighted with the taste and the fact that it is a healthy and simple delicacy. As the gastronomic is an important segment of the tourism supply, traditional and authentic Bosnian dishes represent an important brand, which is why they should be given special attention (Iličić, 2012).

The gastronomic supply is the initiator of the development of gastronomic and culinary tourism (International Culinary Tourism Association). Gastronomy plays an important role in the function of the development of event tourism (Ivković et al., 2003). With the aim of attracting visitors to the destination Sarajevo, gastronomic festivals are organized. The first international gastronomic festival "Bosanski dukat"- a four-day

event of an international character - was held in Sarajevo (Holiday Inn) in the period 07-10.11.2012. year (Association of gastronomes "Gastro corner" and the agency Max style). Over 70 competitors from Bosnia and Herzegovina, Croatia, Serbia, Montenegro, Macedonia, Slovenia, Italy, Romania, Bulgaria and Azerbaijan took part. The aim of the event was to promote the domestic gastronomic supply, the domestic food and wine industry, as well as traditional production (dairy, meat, bakery, confectionery), the promotion of delicacies, and the practice of the tradition of the event. One of the primary goals of the event was to promote festival tourism and enrich the tourist offer of the Sarajevo destination and Bosnia and Herzegovina.

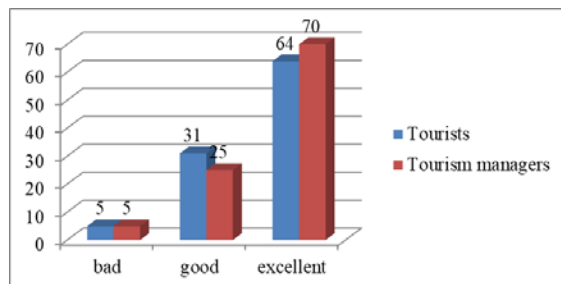


Fig.9 Evaluation of the gastronomic supply of Sarajevo (%) (Authors' own research results)

Although the gastronomic supply of Sarajevo is mostly excellent, yet the smaller number of visitors assessed it as good. „Reasons for possible dissatisfaction are present among narrowly oriented groups of vegetarian consumers, who believe that the traditional Bosnian high-calorie diet is too dominant, or among guests of certain middle-class hotels, due to the uniform offer of food and drink. Some guests had complaints to the more meager menu in several luxury hotels“ (Žunić, 2018). However, all Serbian tourists unanimously agreed that „sarajevski ćevapi“ are their main motive to visit Sarajevo.

4 Conclusion

Gastronomic tourism should be developed by better valorization of gastronomic potential. Gastro & culinary tourism is a form of tourism that is related to destinations where local food and drink are the main motivating factor for travel (International Culinary Tourism Association, USA). Gastro-tourism is a growing segment, and typical gastronomic tours are increasingly combined with other activities such as cultural tours, walks, rides and more. Consequently, this is a segment that greatly stimulates interest and consumption by tourists. Gastronomic tourism tends to be the largest tourist activity, with a large number of consumers traveling to the destination for specific (usually traditional, local) food and drink. Research in America has shown that gastronomy is a motive for visiting 17% (International Culinary Tourism Association), while in our country 14% (Džaferović, 2011). The main research markets for gastronomic tourism are in Germany, England, Belgium, the Netherlands and Luxembourg, Italy, France, Scandinavia and the USA. The most competitive destinations in Europe are: Spain, France and Italy, while in Asia: Japan, India and Thailand (Global Gourmet Tours, United Kingdom). Gastronomic tours can be classified into three types: 1) culinary workshops over the holidays; 2) visits to restaurants famous for their local cuisine or for their famous recognition and visits to catering facilities; 3) visit of food producers with tours specifically related to only one product (eg tour of plantations, tour for lovers of chocolate, wine, etc.). Most gastronomic tours involve a combination of all three types (Shenoy, 2005). Sarajevo, like Bosnia and Herzegovina, has a very rich and recognizable traditional food and beverage preparation. In addition to the offer within the hospitality and accommodation facilities, traditional products can be promoted at thematic fairs, through creative workshops and interesting events (festivals, competitions, etc.). Sarajevo was visited by the world's most popular chefs (Oliver, 2014) who gave the highest rating to Bosnian cuisine, so it is an attributive element of its promotion. Improving supply with new

forms of tourism will create an opportunity for new jobs, for better involvement of the local population in the development of the destination and a more diversified approach to the tourist potential of Sarajevo.

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Primary Paper Section: D

Secondary Paper Section: DE, AH, AK, GM

G AGRICULTURE

GA	AGRICULTURAL ECONOMICS
GB	AGRICULTURAL MACHINES AND CONSTRUCTION
GC	PLANT GROWING, CROP ROTATION
GD	FERTILIZATION, IRRIGATION, SOIL TREATMENT
GE	PLANT CULTIVATION
GF	DISEASES, PESTS, WEEDS AND PLANT PROTECTION
GG	ZOOTECHNICS
GH	NUTRITION OF FARM ANIMALS
GI	FARM ANIMAL BREEDING AND FARM ANIMAL PEDIGREE
GJ	BDISEDAISES AND ANIMAL VERMIN, VETERINARY MEDICINE
GK	FORESTRY
GL	FISHERY
GM	FOOD INDUSTRY

DEVELOPMENT OF AGRICULTURAL, ARABLE LAND AND ORGANIC FARMING IN THE CR, DEVELOPMENT OF LAND PRICES IN SELECTED EU COUNTRIES

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Abstract: The paper compares the development of agricultural and arable land in the Czech Republic between 2000 and 2020. It has been found that the area of agricultural and arable land had decreased. Obviously, the legal norms that are supposed to ensure its protection are not observed in practice and that there can always be found a reason to grant an exception. The paper also examines the development of the prices of agricultural and arable land in selected EU countries between the years 2000 and 2018. In all cases examined, price growth has been recorded. The area of vacant land is decreasing; therefore, the people interested in its purchase are willing to pay high prices. In the paper, the development of organic farming in the CR from the 1990s until present is addressed. There has been a massive development of this way of farming. This could be considered positive, since organic farming is beneficial for the environment, farm animals, and consumers, who can get quality food.

Keywords: agricultural land, arable land, prices, organic farming.

1 Introduction

The basis for life is breathable air and water. In the human body, heart and lungs are connected vessels; similarly, the quality of soil and water are mutually dependent in the landscape. The term land as a production factor refers to land used for agricultural production, a place where other economic activities are carried out (e.g. in the construction sector), or all natural resources. Land, labor, and capital are the basic economic resources. However, it shall be stated that land is currently one of the most endangered resources. It is necessary to realize that becomes increasingly rare and needs to be protected for the future.

Unfortunately, it shows that people are unaware of the importance of land. This is alarming especially in the case of politicians who make decisions concerning present as well as the quality of life in the future. In the past, the protection of the environment was considered just "icing on the cake", which is an attitude leading to the devastation of the environment not only in the CR but in almost all states. Nevertheless, some people are already beginning to realize that the environment, which includes land, is a complex system affecting the everyday life of all people.

However, there is still the detrimental practice of land take, especially the high-quality land, for the purposes of building apartment blocks, industrial premises, highways, etc. Citizens, and particularly politicians who are responsible for making decisions concerning land take, should consider all potential risks prior to issuing these decisions or in creating legal standards. An example could be the current political and economic situations. At the beginning of this year, hardly any person would have thought that Russia would attack Ukraine and what impacts, whether political or economic, this conflict would have for almost the whole world. The EU countries are now striving for ensuring energy for their inhabitants and industry, which is challenging but feasible. Another example can be the problems that arose during the outbreak of the Chinese flu epidemic. As there was a lack of protective aids in Europe, countries had to buy overpriced and even low-quality protective aids from China. However, food shortage in the EU would have far worse consequences. The EU now produces more food that it can consume but there is still a risk that it will change in the future. The volume of fertile land is decreasing, increasingly larger areas are drying out due to the climate changes, thus becoming less fertile. If land is destroyed by using it for construction, there will be no place for agriculture. It takes one centimetre of soil about one hundred years to form. If there is no opportunity or place for producing enough food, there will be a complete breakdown of society.

A big challenge is the so-called Green Deal for Europe, which raises concerns among many politicians and entrepreneurs. In fact, it is a great chance for Europe where citizens first change their thinking and then their behaviour. The principles of Green Deal can be easily combined with solutions to current problems. Naturally, this cannot be done within a few months but over the course of the next few years. It is assumed that saving resources or using local renewable resources not only save money but enable citizens to become more independent. The paramount is the change in people's thinking followed by the courage of politicians to implement the changes.

The paper deals with the development of the land fund in the Czech Republic and the acreage per inhabitant by regions. Moreover, it analyses the development of land prices in the CR and selected EU countries and focuses also on the development of organic farming in the CR, mapping its development from the beginning of the 1990s until present.

The goal of the paper is to compare the development of land fund in the Czech Republic and the development of the acreage of agricultural and arable land per inhabitant by regions in the monitored period. Attention is also paid to the comparison of agricultural and arable land prices development in the CR and selected EU countries, and the assessment of the development of organic farming in the CR with selected EU countries.

To achieve the defined goals, the following questions are formulated:

1. Which region of the CR has shown the greatest loss of agricultural and arable land in recent years?
2. Have the prices of agricultural and arable land in the EU decreased, increased, or stagnated?
3. Is organic farming on the increase in the Czech Republic?

2 Literature Research

The environment concerns us all, engaging in our daily life, previous and new generations. In his encyclical from June 2015, Pope Francis warned about environmental pollution, whose abatement went ignored by global authorities and a neglectful population. We relished the idea of being the global rulers, having the carte blanche to devastate nature. Changing our deep-rooted mindset requires discipline and strong motivation. Pope Francis tries to hold a dialogue on the future of our planet, 'Our Common Home'. Every person living on the Earth is a part of nature, where social inequalities affect humanity. The ecological debt set people thinking about the ethics of international relations, severely harming the environment and depleting natural resources.

Many scholarly articles and literature have extensively discussed how humanity treats natural heritage or capital, considering land a dynamic, organic and ever-changing structure integrated with a specific country. Čílek et al. (2022) warns about excessively consuming the Earth's natural resources. On top of ethical responsibility, we must fight for the survival of young and new generations, which will need a sustainable ecosystem. People must understand that they are just another brick in the wall and cannot pillage the planet without serious repercussions (Čílek et al., 2022). Soil is the outermost layer of the Earth's crust, comprising water, air and organisms, originating from the pedogenesis process involving external and temporal factors. Current soil contains mineral and organic particles, wears away by erosion, and is no older than the Pleistocene. Their morphological organization provides habitat to plants, animals and humans. Soil does not renew in a span long enough for people, allowing only for non-renewable natural resources. Blum (1998) suggests these soil functions: food and biomass production, retention soil filters, habitat and food for organisms, material for human activities and buildings, raw material source

and cultural heritage. Jelenová (2004) argues that soil involves a crucial factor behind efficient food production and natural heritage.

Field (2017) argues that land ensures food, water, energy and high biodiversity, improving human health. It also contains organic carbon that cuts greenhouse emissions. Moldán (1997) suggests that land comprises natural capital that contributes to national heritage. The World Bank proposes this indicator as an adequate replacement for the gross national product that will safeguard sustainable biodiversity.

The land has a production and non-production function. The former involves agriculture and forestry, while the latter encompasses ecology, technology (natural resources, building foundations), history (nature archives), aesthetics and recreation. The landscape provides a natural habitat for plants, serves as a water filter, ensures water cycles, contains nutrients and substances and gives foundations for buildings. As a non-renewable resource, land is essential for survival and nourishing plants and various animals (Šimek et al., 2019). On top of its nurturing function, the landscape lays the foundations for human dwellings and purifies water. Soil provides an invaluable genetic repository in the form of microorganisms. Soil organic matter is a vast natural reservoir of carbon, nitrogen, phosphorus and sulphur. Although people always ran and cultivated farms, the landscape has recently suffered devastating effects (Environment Yearbook Welcome to Earth. National Information Institute for Education, 2008).

Since the 1990s, hectares of fertile land have disappeared, given developed areas and built roadways. Storage spaces and industrial and residential areas have been growing exponentially, yet giving way to new ecological trends (CENIA, 2016). Seven ecological (environmental) functions include filtration, accumulation, retention, purification, transformation, decontamination and transportation. The land also creates genetic repositories and wildlife habitats. Zámková (2021) found that farmers welcome eco-farming as an attractive alternative to traditional agriculture, meeting the high demand for eco-products (Zámková et al., 2021). Bryant (2022) confirms the transition to farming alternatives, giving reasonable grounds for abandoning industrial agriculture in favour of the environment, animals, and personal and public health. Plant-based animal product alternatives (PB-APA) aim to reduce animal product consumption by effectively combining style, price and comfort (Bryant, 2022). The dynamic development of eco-agriculture in some regions informed us about converting arable land to eco-farming. When mapping the conversion of agricultural land to the ecological system, we relied on the same regional classification according to the representation of eco-farming as in 2000. This categorization reflects the ratio of the converted land to the total eco-agriculture area in regions with the lowest eco rates in 2000 (Hrabák, 2020).

The terrain and land have been evolving since they exist. The landscape evolution responds to multiple environmental influences, including terrain folding, land registry, impactful historical events and related social changes (government land seizure in the seventeen century). We also observed the impact of social and political factors on landscape formation and how various terrain types adapt to the environment (Fanta et al., 2022).

Hrabák (2020) argues that people can use the land for different purposes than farming and growing plants, condemning cultivating biofuels on the arable land. Čermáková (2019) suggests changing European regulations and then adopting remedial measures. One centimetre of quality arable land can absorb water and prevent water and wind erosion, forming for one century. Rather than creating jobs, the Czech Republic should focus on long-term land protection.

We estimate that 95% of food comes from land and the rest from sea fish and fruits. The land also gives birth to technical, medicinal and aromatic herbs. Although arable land covers 13% of the dry land, the Earth embraces 87 m km² (Šimek, 2019).

Land users were well aware of its scarcity, giving rise to cut-throat competition between the following sectors: settlements/transport, agriculture, forestry and environmental protection (Gebeltová et al., 2017).

The Czech Republic rents the land to 80% of farmers, who struggle to pay the rent. This article explores the price movement of Czech agricultural land and discovers the causes and effects of this change on national land ownership (Severová et al., 2021). Some investors, who are not farmers, purchase arable land for ten Czech Crowns to sell for thousands when the zoning managers decide to build flats or commercial areas (Ginter, 2022).

The landscape must be ecologically stable, leaving a permanent memory trace. Unfortunately, our territory witnessed the ploughing of 45 k ha of meadows, 240 k ha of baulks, 50 k ha of groves, more than 2/3 of dirt roads and destroying 45 k km of linear greenery. In 2000, the European Council discussed land protection, adopting the European Landscape Convention joined by the Czech Republic (Malá, 2003). The total area of the Czech land fund amounts to 7,887 k ha, while the overall extent of the Czech agricultural land fund (ZPF) is 4,200 k ha to 31.12.2020. The share of the farmland (z.p.) equals 53.25% of the Czech total land fund area, whereas arable land peaks at 37.17% of the overall land fund area. The plough rates slid from 71.6% in 2005 to 69.8% in 2020, indicating a slight decrease. Since 1999, the Czech Republic has seen a decline of farmland by 82,424 ha, which is 10.7 ha/day on average. This slump reflects extensions of forest covers and water surfaces and, to some extent, expansion of built-up and other areas (Situational reports and forward-looking statements MZ - land, 2021).

Europe is witnessing accelerated property development, growing by 9% between 1990 and 2006 (Prokop et al., 2011). Many enterprises eagerly seize and deplete farmable and agricultural land, regardless of the legislation. Zoning regulations and decrees apply only to the poor, leaving large investors exempt from the law (Vašků, 2008).

Climate change currently troubles the entire world, which has recently been facing severe droughts. Although the temperature shifts directly involve uncontrollable natural processes, anthropogenic activities, including past interferences with nature, gave rise to many of today's problems. Disrupted flows, landscape desiccation and expanding fields are only some items to put on the blacklist. Covering large areas with concrete prevents water from soaking into the ground, causing massive surface runoffs. Too long have we been damaging the land, and remedial measures will be costly. Instead of brownfields, investors, hellbent on monetizing, use farmland for developing industrial and commercial zones, ignoring drastic social and economic repercussions.

Rather than quality, the land valuation rewards locality, observing supply and demand when setting the price (Nývtová, et al., 2016). A healthy environment reflects a prosperous economy, as in Sweden, Denmark or Canada (Epping, 2004).

The Czech Republic has the hugest land fragmentation in Europe, renting most of the arable land to farmers. In 2013, the owned/rented land ratio peaked at 25.7%. The country also ranks first regarding the past massive agricultural production and land blocks in Europe. Konečný et al. (2017) argues that Czech surveyors have recently focused on the regional impacts of transformed agriculture and adopted a joint agricultural policy on farming (Konečný et al., 2017).

The agricultural land fund involves farmlands, including arable land, hop gardens, vineyards, gardens, orchards, permanent grasslands and farmable land that lies fallow. This ecosystem further includes duck or fish ponds. We shall not omit non-agricultural land, ensuring agro-production that comprises dirt roads, plots with irrigation equipment, irrigation tanks, drainages, dams against wetting or flooding and technical anti-erosion facilities.

The Act on Protecting Agricultural Land Fund in the Czech Republic - Nature and Landscape Protection under sec. 2, ss. (2) par. h) Act No. 114/1992 Sb., Nature and Landscape Protection, governs the protection of land funds, including land development. The agricultural land fund is our natural heritage and irreplaceable food source, creating a biophysical environment. The protection of farmable land fund, its cultivation, and careful use ensure environmental protection under Act No. 334/1002 Sb., Agricultural Land Fund Protection Title I - Agricultural Land Fund, sec. 1, ss. (1). The same act in Title III, sec. 4 governs Principles of Agricultural Land Fund Protection. Non-farmable land should serve non-agricultural purposes, including unused and vacant lands in developed municipal areas, empty building plots outside the territory, gap sites or empty plots after pulling down derelict buildings. Should seizure of the cultivated land fund take place, it is imperative a) not to disrupt agricultural land fund organization, hydrological/runoff ratios in the territory and agricultural road networks, b) not to seize more land fund than necessary, c) to avoid hindering further cultivation of the agricultural land fund, d) to prepare the used land for recultivation after the permission for non-agricultural activities extinguishes.

Unfortunately, agricultural technologies aim only to boost results, adversely affecting land's ecological functions. Matulová and Cechura (2016) found comparatively low land supply elasticity in the plant and combined production. It is surprising because land, as a crucial production factor, determines the final product. The author puts it down to inefficient support allocation policies among farmers who possess the plot but use it extensively (Matulová and Cechura, 2016).

Situation reports and forward-looking statements of MZ CZ - land (2018) state that soil sealing relates to uncontrollable suburbanization and, together with erosion, imposes enormous pressure on agricultural land. Soil sealing is covering the land with impervious materials. Soil irreversibly loses its resources and cannot serve the ecosystem. Low land prices attract investors to greenfield projects rather than use built-up city areas or encourage brownfield revitalization. The soil then loses its quality and production, and ecological functions.

Tremendous losses of agricultural land entail less fertile ground for future generations, decreasing territorial biodiversity and changing the landscape. Due to inhibited infiltration and retention, raindrops cause territorial floods within built-up areas. Groundwater depletion, new buildings, increased traffic volumes, and wastewater may be a source of massive contamination. The position of the Czech Republic in the 'heart' of Europe is ideal for soil sealing and developing transit centres and storage.

On the other hand, extensive forest areas are not always rewarding. Although the Czech Republic boasts the hugest forests within the last 400 years, these wood areas have turned into plantations. Dense and linear conifer plantations serve a single purpose - the mass production of wood. 'How could a creature survive in such a habitat' Miroslav Svoboda, professor of the Department of Forest Ecology from the Czech University of Life Sciences in Prague (CZU).

Drastic climate change makes the plantation economy detrimental, pushing plants and animals out of the forest, which loses its essential features (Svěrák, 2022).

The EU authorities have long been dealing with land cultivation. Resolutions on Protection on Soil Protection (2021/2548/RSP) suggest that healthy soil is a resource of essential nutrients, ensuring sustainable food production. The resolution holds that nutrition sustainability, mainly plant food, safeguards the appropriate use of land. Good soil helps achieve the goals of the European Green Deal, including climate neutrality, renewing biodiversity, zero emissions free of pollutants, effective and sustainable food systems and a healthy environment. The land is at the centre of attention when implementing Farmer to Consumer marketing, the EU strategy on forestry, recovering

biodiversity until 2030 and zero air, water and soil emissions. The European Commission's action plan involves removing all land pollutants and revising directives on industrial emissions.

In 2018, the Copernicus Climate Change Service mapped the whole of Europe, producing valuable data for landscape analysis and land use in the EU member states. The findings revealed greater landscape stability after 2000. Arable land covers 25%, pastures reach 17%, and forests extend to 34%. The suburban expansion between 2000 and 2018 embedded an area about the size of Slovenia, consuming vast grassland areas. Between 2000 and 2006, built-up areas amounted to 1,086 km², plummeting to 711 km² in 2012 - 2018.

The soil quality impacts its purchase or rental price, determining the capital investments in the agricultural business run by a landowner. The land price is subject to land appreciation or valuation (Broušková, 2011).

Climate change gave rise to a dramatic average temperature increase and precipitation upheaval, causing marked discrepancies between tabular overviews and reality. We cannot predict whether the effects will positively or negatively impact agricultural production and official land prices (Slaboch et al., 2022).

The findings show that land prices in ESEU have skyrocketed to 20.6 M CZK (converted to current prices) over the last 180 years, expected to peak at 10 M CZK according to the planned land use. The figures also show that ESEU prices are 36% higher on average than in 2002. This growing trend will entail tremendous losses of agricultural land, disrupting sustainable agriculture and depleting food sources (Szturc et al., 2019). While farmers can still enjoy fertile and rich farmland, non-agricultural investors are in dire straits over exorbitant land investment prices (Soukal, 2017). The re-establishment of the right of first refusal will also disrupt the market. The appreciation of CZK against EUR and USD will produce the same negative effect, imposing inflated prices on investors from Germany, Austria, The Netherlands and Belgium (Soukal et al., 2017).

3 Methodology

First, the development of land fund and agricultural land in the Czech Republic between the years 2000 and 2020 is compared, which will be followed by the comparison of the acreage of agricultural and arable land in the CR per inhabitant by regions. The output is the increase or decrease in the acreage expressed in percentage. Furthermore, there will be compared the average prices of agricultural and arable land in selected EU countries where the output will be the percentage increase in the prices. Finally, there will also be monitored the development of organic farming (OF) in the CR between the years 1990 and 2020 by means of monitoring the overall acreage in the system of organic farming compared to the overall acreage of agricultural land fund. There will be examined the development of land fund in organic farming in the CR expressed in ha between the years 2005 and 2020. The output is the percentage increase in acreage used for organic farming.

4 Results

Land fund is classified according to individual types of land (arable land, hops, vineyards, gardens, orchards, permanent grassland, forest land, water bodies, built-up areas and courtyards, other areas).

The agricultural land fund is the basic natural wealth of a country, an irreplaceable production tool enabling agricultural production, and is one of the main components of the environment. The protection of agricultural land fund consists in its use for agricultural purposes and in the legal regulation of its protection during spatial planning activities, for construction, mining, and industrial activities, as well as in geological surveys (e.g., the obligation of overburden). The removal of land from

agricultural land fund is conditioned by the consent of the agricultural land fund protection authority (Table no. 1).

Tab. 1: Development of land fund in thousands ha in the Czech Republic

Period	Agricultural land	Forest land	Water bodies	Built-up area	CR in total
As of 31 December 2000	4 280	2 637	159	130	7 887
As of 31 December 2020	4 200	2 677	167	133	7 887
Increase +, decrease – in %	-1.87	+1.5	+5.0	+2.3	0

Note: the difference between the area of individual land fund components and the total acreage of land in the CR represents the so-called “other area”

Source: Situational and forward-looking report of the Ministry of Health of the Czech Republic - soil, 2021, author

Table no. 2 show development of land fund in thousands ha in the Czech Republic

Tab. 2: Development of land fund in thousands ha in the Czech Republic

Period	Agricultural land	Arable land	Hops	Vineyards	Gardens	Orchards	Permanent grassland
As of 31 December 2000	4 280	3 082	11	16	161	49	961
As of 31 December 2020	4 200	2 932	9	20	172	44	1 023
Increase +, decrease – in %	-1.87	-4.87	-18.19	+25.00	+6.80	-10.21	+6.45

Source: Situational and forward-looking report of the Ministry of Health of the Czech Republic - soil, 2021, author.

Table no. 3 show acreage of agricultural land and arable land in the CR per inhabitant as of 31 December 2018

Tab. 3: Acreage of agricultural land and arable land in the CR per inhabitant as of 31 December 2018

Region	Acreage per 1 inhabitant	
	Agricultural land (ha)	Arable land (ha)
CZ010 City of Prague	0.0152	0.0109
CZ020 Central Bohemia	0.4869	0.4016
CZ031 South Bohemia	0.7637	0.4788
CZ032 Plzeňský	0.6493	0.4343
CZ041 Karlovarský	0.4195	0.1790
CZ042 Ústecký	0.3347	0.2193
CZ051 Liberecký	0.3156	0.1423
CZ052 Královéhradecký	0.5020	0.3417
CZ053 Pardubický	0.5211	0.3747
CZ063 Vysočina	0.8020	0.6184
CZ064 South Moravia	0.3578	0.2957
CZ071 Olomoucký	0.4380	0.3230
CZ072 Zlínský	0.3303	0.2052
CZ080 Moravia-Silesia	0.2266	0.1394
CR	0.3962	0.2782

Source: Czech Geodetic and Cadastral Office, 2019.

Table no. 4 acreage of agricultural land and arable land in the CR per 1 inhabitant as of 31 December 2021

Tab. 4: Acreage of agricultural land and arable land in the CR per 1 inhabitant as of 31 December 2021

Region	Acreage per 1 inhabitant	
	Agricultural land (ha)	Arable land (ha)
CZ010 City of Prague	0.0146	0.0105
CZ020 Central Bohemia	0.4704	0.3852
CZ031 South Bohemia	0.7598	0.4707
CZ032 Plzeňský	0.6375	0.4219
CZ041 Karlovarský	0.4238	0.1780
CZ042 Ústecký	0.3361	0.2196
CZ051 Liberecký	0.3152	0.1399
CZ052 Královéhradecký	0.5015	0.3349
CZ053 Pardubický	0.5159	0.3683
CZ063 Vysočina	0.8009	0.6158
CZ064 South Moravia	0.3531	0.2907
CZ071 Olomoucký	0.4388	0.3221
CZ072 Zlínský	0.3316	0.2009
CZ080 Moravia-Silesia	0.2287	0.1394
CR	0.3923	0.2730

Source: Czech Geodetic and Cadastral Office, 2022.

Table no. 5 show change in the acreage of agricultural and arable land in the CR per 1 inhabitant between 2018 and 2021

Tab. 5: Change in the acreage of agricultural and arable land in the CR per 1 inhabitant between 2018 and 2021

Region	increase +, decrease – acreage per 1 inhabitant between 2018 and 2021 in %	
	Agricultural land (ha)	Arable land (ha)
CZ010 City of	-4.0	-3.7
CZ020 Central	-3.7	-4.1
CZ031 South	-0.5	-1.7
CZ032 Plzeňský	-1.9	-3.0
CZ041 Karlovarský	+1.0	-0.5
CZ042 Ústecký	+0.5	+0.1
CZ051 Liberecký	-0.01	-1.7
CZ052	-0.1	-2.0
CZ053 Pardubický	-1.0	-1.8
CZ063 Vysočina	-0.1	-0.5
CZ064 South	-1.5	-1.7
CZ071 Olomoucký	+0.1	-0.3
CZ072 Zlínský	+0.3	-2.1
CZ080 Moravia-	+0.9	0
CR	-0.1	-1.7

Source: Author.

The above tables suggest that between 2000 and 2020, there was a decrease in the total acreage of agricultural land in the CR, specifically in the case of hops and orchards, while the acreage of vineyards and forest land increased. However, this does not necessarily mean a positive phenomenon, because a large part of Czech forests are the so-called spruce plantations, commercial forests that have no positive effect in terms of biodiversity. In contrast, they pose a risk of calamity, as could have been seen in recent years in the case of the spruce weevil. There was also an

increase in water bodies and, unfortunately, also the acreage of built-up areas.

The area of orchards decreased mainly because farmers have little sales for their production due to the import of cheap fruit from abroad and old orchards are thus no longer renewed. As for the EU countries, the greatest decrease in arable land in the period 2006 - 2012 was recorded in the Netherlands, Spain, and the Czech Republic, mainly because land take for the construction of industrial commercial premises and construction of houses and apartment blocks (Atlas půdy, 2018).

Nearly three quarters (71.5 %) of arable land in the EU are located in seven member countries only. In 2016, France used 27.8 million ha of arable land for agricultural purposes; in Spain, it was 23.2 million ha, in Great Britain and Germany 16.7 million ha, in Poland 14.4 million ha, Italy 12.6 million ha and Romania 12.5 million ha.

Agricultural companies in the EU managed about two fifths (38.8 %) of the total area of EU used as agricultural land, forest land (6.2 %) and other agricultural land not used for the purposes of agriculture (2.1 %). In some EU member states, agricultural land dominated in the rural areas. Two thirds of the area were used as agricultural land in Ireland (70.0 %) and Great Britain (65.7%), and the share was also very high in Denmark (60.9 %). This contrasted significantly with Finland (6.5 %) and Sweden (6.9 %) where the landscape was dominated by forests. These two Nordic countries were the only two EU member states where forest land owned by agricultural companies represented a larger share than land used for agricultural purposes.

In the EU, the area of land used for agricultural production did not change significantly (+0.2 %) between 2005 and 2016 despite of the sharp decline in the number of agricultural companies (Statistika zemědělství, lesnictví a rybnářství, 2018).

The prices of agricultural land differ significantly in individual EU countries even in terms of neighbouring regions. The reasons include diverse soil and climatic conditions, uneven acreage of agricultural land in relation to the number of inhabitants, diverse business structure of agriculture, diverse economic situation of individual countries and often even smaller territorial units, as well as different regulatory measures of individual states concerning the acquisition and selling of agricultural land. There are also differences in the development of land prices over time when most countries show an increase in land prices, which is typical especially for the new EU states with membership from 2004, 2007 or 2013. Within the monitored EU countries, the highest average prices of arable land are recorded in the Netherlands, where in the last monitored period 2011-2018, the prices fluctuated between EUR 50,000 – 70,000 per ha. These high prices are given by very intensive agricultural production, a considerable extent of greenhouse farming, and mainly the lack of land for sale. High prices are recorded also in Italy, Luxembourg, and Germany. In Ireland, the price of arable land reached EUR 28 k/ha in 2019 and in Great Britain, it was EUR 23 k/ha in 2018. Within the EU 15, the lowest prices of agricultural land are recorded in France. Due to the different natural conditions including lowlands to mountain areas, France shows considerable price differentiation depending on the region. Relatively low prices are recorded in Sweden and Finland. Within EU-13 (countries that joined the EU between 2004 and 2013), there are also considerable differences at the level of average selling prices of agricultural land. According to Eurostat, in 2019, the highest prices of agricultural (or arable) land were recorded in Slovenia (nearly EUR 19 k/ha), Poland (almost EUR 11 k/ha) and the CR (EUR 8 k/ha). Prices lower than in the CR are reported in Hungary and Bulgaria, Latvia, Lithuania, Estonia, Croatia, and Romania. The stated variability of prices and their year-on-year changes are affected by the methodology used to determine selling prices in individual countries in individual years but also reflect the objective facts arising from the specifics of individual countries both in terms of natural conditions and production structures as well as tax and legal aspects given by various legislation concerning the area of

market and protection of agricultural land fund as well as the regulation of the land market in many countries.

Table no. 6 show average prices of agricultural land in selected EU countries in EUR/ha

Tab. 6: Average prices of agricultural land in selected EU countries in EUR/ha

Country	2000	2018	Percentage increase %
Finland	3 933	8 380	213.06
France	3 650	6 020	164.93
Germany	9 081	25 485	280.64

Source: Situational and forward-looking report of the Ministry of Health of the Czech Republic - soil, 2021, author.

Table no. 7 show average prices of arable land in selected EU countries in EUR/ha

Tab. 7: Average prices of arable land in selected EU countries in EUR/ha

Country	2000	2018	Percentage increase %
Denmark	10 867	17 690	162.78
Netherlands	35 576	70 320	197.66
Sweden	2 123	8 842	416.48
Poland	1 194	10 414	872.21

Source: Situational and forward-looking report of the Ministry of Health of the Czech Republic - soil, 2021, author.

The Czech Statistical Office states that in 2013, the average price of agricultural land per square meter in the Czech Republic was CZK 8.6, and yet by 2019, the price increased up to CZK 18.9.

The most expensive agricultural land has been recorded in the Prague – East district, where the price per square meter stood at CZK 38.5 in the 2019-2020 period, followed by the Olomouc district (CZK 27.31 per square meter) and the Znojmo district (CZK 26.24 per square meter).

Recently, the European Union has focused on the issue of organic agriculture (organic farming) as well.

The European Union organic logo provides a comprehensive visual identity for organic products that are produced as well as sold in the EU. It makes it easier for EU consumers to recognize organic products and helps farmers to market their products in all EU countries.

The logo can only be used on products that have been recognized as organic and approved by the EU Control Agency or entity. This infers that such products have met strict conditions related to how they are produced, transported, and stored (Figure no. 1).

Figure 1: Organic farming logo



Source: Control of organic farming, 2022.

Organic farming is one of the fastest growing areas within the EU agricultural sector. It is a direct result of increased consumer interest in organic products. The EU has responded to the challenges posed by this rapid expansion and created an effective

legal framework for this EU sector. New legislation on the organic production sector has previously been adopted and came into force on 1 January 2022.

Changes brought about by the new organic production regulations involve:

- strengthening the control system, which will contribute to greater consumer confidence in the EU organic farming system,
- new rules for producers, which will facilitate the transition to organic production for smaller farmers,
- new rules for imported organic production, so that all organic products sold in the EU meet the same standards,
- a greater range of products that can be marketed as organic.

The new legislation on organic production is supported by the Action Plan for Organic Farming launched by the European Commission in March 2021 (European Commission, 2008).

The European organic food market achieved a record level in 2020. It grew by 15% year-on-year and reached EUR 52 billion, representing the highest growth rate in the last ten years. The growth of ecologically managed land also continues. The latest data are based on The World of Organic Agriculture yearbook, which is regularly published by The Research Institute of Organic Agriculture in Switzerland (FiBL) and IFOAM Organics International.

In 2020, 17.1 million ha of agricultural land were managed ecologically in Europe (out of which, 14.9 million ha in the EU). With almost 2.5 million ha, France has become the new number one in relation to acreage of agricultural land in organic farming, followed by Spain (2.4 million ha), Italy (2.1 million ha) and Germany (1.7 million ha). These four countries are home to more than half of Europe's organic farmland. The Czech Republic maintains seventh place within the EU behind Austria (680 thousand ha) and Sweden (614 thousand ha). (Institute of Agricultural Economics and Information, 2022).

Since the end of the 1990s, the use of agricultural land in an ecological way has been increasing in the Czech Republic. As of December 31, 2020, this is related to approximately 543,000 ha of agricultural land, which is 15.28%. Organic farming (OF) corresponds to the principles of sustainable agricultural development. In addition to the production of organic food, it contributes to better living conditions for farmed animals and protection of the environment as well as to an increase in its biodiversity. Organic farming supports economic and social development in less favourable and lagging rural areas.

Table no. 8 show development of organic farming in the Czech Republic

Tab. 8: Development of organic farming in the Czech Republic

Year of Acreage	Number of farms in OF	Total Acreage of Land in OF (in ha)	Share of Total Acreage of Agricultural Land Fund (in %)
1990	3	480	-
2020	4 665	543 252	15.28

Source: Situational and forward-looking report of the Ministry of Health of the Czech Republic - soil, 2021.

Table no. 9 show development of agricultural land fund structure in organic farming in the CR expressed in ha.

Tab. 9: Development of agricultural land fund structure in organic farming in the CR expressed in ha

Year	Arable Land	Permanent Grassland	Permanent Vegetation	Other Areas	Total
2005	20 766	209 956	820	23 440	254 982
2020	93 701	443 262	6 071	218	543 252
Percentage increase %	+451,22	+211,12	+740,36	-0,93	+213,05

Source: Situational and forward-looking report of the Ministry of Health of the Czech Republic - soil, 2021.

5 Discussion

The first research question was related to an enquiry into which region in the Czech Republic has experienced the greatest loss of agricultural and arable land. It was found that the loss of agricultural and arable land between 2000 and 2020 was particularly significant in the vicinity of Prague and in the Central Bohemia Region. Large-scale construction of industrial and storage areas has been taking place here on high quality land. At the same time, however, storage areas do not signify any added value for the future, they are not a promise of future scientific and technical development.

Yet another issue is the construction of motorways. Not only is there a loss of land, but (in connection with new roads and motorways) also more land is being taken over, as more and more parking spaces are built and more housing development is created in close surroundings, which irreversibly destroys the land. Preference should be given to rail transport, which is least harmful to the environment.

Except for the Karlovy Vary, Ústecký, Olomouc, Zlín and Moravian-Silesian regions, the area of agricultural land per inhabitant of the region decreased. In terms of arable land, the area per inhabitant increased only in the Ústecký region, while there was a decrease in the other regions as well.

The second research question dealt with the development of agricultural and arable land prices in EU countries. The research was conducted between 2000 and 2018 in selected EU states. It was found that there was a significant increase in the price of land in all selected countries. This also corresponds to the situation in the Czech Republic, where the most expensive land is found around Prague. It is logical, since a smaller area of land is available and yet there is increasing pressure to occupy it due to all kinds of construction.

The third research question was focused on the development of organic farming in the Czech Republic. It was found that from the 1990s to 2020, there was a massive increase in the number of farms operating in the organic farming system of the Czech Republic. Between 2005 and 2020, the area of permanent vegetation and arable land in the organic farming system considerably increased, and the area of permanent grassland also increased significantly. This can be evaluated positively, as this farming system is friendly to the environment, and farm animals kept in such conditions are ensured certain welfare. As a result, organic farming products also have a positive effect on the health of their consumers.

In ecologically managed farms, the acreage of other areas (roads, paved areas intended for handling loads, etc.) was reduced to approx. 0.93% in comparison with the situation in 2005.

6 Conclusion

The aim was to assess development of the area of agricultural and arable land in the Czech Republic, development of agricultural and arable land prices in selected EU countries and development of organic farming in the Czech Republic.

It was found that in the last twenty years there was a significant decrease in agricultural and arable land, particularly in the vicinity of Prague and in the Central Bohemia Region. It is an unfortunate phenomenon, since in these areas the soil is of exceptional quality. Nobody knows what the future holds and yet ensuring enough quality food for the population is a crucial task. In the period under review, the area of vineyards, water areas, gardens and forest land increased, while the area of hop farms and arable land decreased.

As regards prices of agricultural and arable land, there was a significant increase in that respect in selected EU countries, including the Czech Republic. It remains to be seen, however, whether this is because one values the land as such or because certain developers want to purchase such land for construction purposes at all costs. On the one hand, there are dilapidated industrial areas, uninhabited apartment buildings, and on the other hand, agricultural, or even arable land, is irreversibly destroyed for these purposes. It is necessary to bear in mind that sufficient area of land, which fulfils all its functions, is essential for life, as it also reduces the risk of floods and droughts. The paper is concerned with development of the market price of land, although the real value of agricultural, or even arable land, is basically incalculable, since land as such cannot be produced and yet is necessary for life.

A positive phenomenon may be seen in the development of organic farming in the Czech Republic, as well as in a significant increase in the areas on which this activity is carried out. Agriculture in the organic farming system is beneficial in all respects and therefore its support is necessary.

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HUMAN CAPITAL IN AGRICULTURE: BARRIERS TO INDUSTRY 4.0

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Abstract: The aim of this paper is to identify the challenges to Industry 4.0 implementation in agriculture with emphasis on the human factor, which is an issue not sufficiently dealt with in the current literature. Investments in Industry 4.0 technologies and tools enable enterprises to increase labour productivity, to more accurately predict future developments, and allow employees (operators, managers and executives) to make informed day-to-day decisions based on real-time data, facilitating in-house departmental collaboration. Over the period 2019–2020, the authors conducted a survey (semi-structured face-to-face interviews) among almost thirty representatives of agricultural enterprises, advisers and secondary school head teachers. Primary data showed significant agricultural labour shortages, which is one of the reasons why farm managements decide to automate and robotize the production process. In addition to high financial costs, barriers to the digital technologies include concerns about power outages and subsequent data losses. The present survey results also indicate possible impacts on the workforce, the feeling of losing touch with farming practice in particular.

Keywords: Industry 4.0, agriculture, robotization, labour market, employment, barriers

1 Introduction

In recent years, the concept of Industry 4.0 (Fourth Industrial Revolution) in agriculture has been increasingly embraced. In the primary sector, too, future innovation trajectories are to be designed and particular technologies prioritized (Levidow et al. 2012; Schlaile et al. 2017; Klerkx and Begemann 2020; Klerkx and Rose 2020). Industry 4.0 in agriculture is still ambiguously defined, often confused with the terms smart/precision/digital agriculture, bio/circular economy or aquaponics (Regan 2019; Klerkx and Rose 2020; Hermans 2018; Junge et al. 2017; Pigford et al. 2018). It is associated with various emerging technologies (Klerkx and Rose 2020) such as artificial intelligence, drones, robotics and gene modification. It will revolutionize current agricultural values and identities (Eastwood et al. 2019; Fielke et al. 2020). However, without a clear indication of which technologies are involved in this process, it is difficult to determine how they are perceived by different stakeholders, and what their unequal effects on society may be.

Advances in technologies have always raised concerns that they will redraft the map of the required professions, leading to unemployment and social instability (David 2015; Mokyr et al. 2015). Despite its seriousness, this problem resists conceptualization and methodical approach (Mokyr et al. 2015). Industry 4.0 offers many opportunities and benefits such as competitive advantages, making companies more attractive to the young workforce in particular. Investments in Industry 4.0 technologies and tools enable enterprises to increase labour productivity, to more accurately predict future developments, and allow employees (operators, managers and executives) to make informed day-to-day decisions based on real-time data, facilitating in-house departmental collaboration.

The transformational power of Industry 4.0 will also affect agriculture (connecting farms, introducing smart machinery, tractors, vehicles, etc.). This will make labour productivity and environmental protection more effective. It will also bring about changes in the value chain and business models with a greater emphasis on know-how gathering, analysis and exchange. This will be reflected in the labour market and the structure of employment. Industry 4.0 in agriculture is currently being developed within a conceptual framework, not taking into

account possible barriers, drawbacks or detrimental effects on human resource management.

While the Industry 4.0 implementation in the manufacturing sector has been covered in the professional literature (industrial application is principally simpler and more advanced, Industry 5.0 already gaining ground (Demir et al. 2017; Özdemir and Hekim 2020)), Industry 4.0 agricultural agenda, on the other hand, still remains to be mapped out in more detail. Therefore, it is the very latter sector that is the focus of the present survey undertaken on a sample of selected respondents.

The aim of this paper is to present the results of qualitative research focused on the barriers of Industry 4.0 in agriculture with particular interest in human capital. After a brief introduction, the article is divided into four sections. The literature review gives an outline of the existing body of knowledge about the issue of Industry 4.0 in the sector of agriculture. The following section explains the method employed, i.e., semi-structured interviews with agricultural managers, advisers and school headmasters. The results of the research are presented and discussed in the third and summarized in the final section

2 Literature references

Industry 4.0, or the so-called Fourth Industrial Revolution, brought about radical changes to both organizations and employees. Mayer (2020) points out that the former must cope not only with major technological innovations and new concepts of labour and employment, but also with the latter's perception of the rapid change.

Having been introduced at the Hannover Trade Fair in 2011, Industry 4.0 agenda became the official German strategic initiative in 2013 (Kraft et al. 2017; Xu et al. 2018). Industry 4.0 is considered a kind of industrial revolution of the 21st century which is rapidly transforming the management, organizational structures and competencies, subjecting them to more intensive scrutiny. As Geissbauer et al. (2016) claim, Industry 4.0 has proven to be a promising technological framework for integrating and expanding production processes both internally and externally.

Regarding agricultural production, the above transformational drive will result particularly in farm mergers and the application of smart solutions to farm machinery. Farming of the future will make greater use of sophisticated technologies (e.g., robots, temperature and humidity sensors, aerial photos and GPS technology), allowing agricultural businesses to become more profitable, efficient, safer and more environmentally friendly. In agriculture, the concept of smart environment emerged later than in industry, although some related technologies such as precision farming or the farm management information system have long been in operation.

Zheng et al. (2011) explain how ICT is applied to the visualization, design, monitoring and control of agricultural buildings and processes in the so-called digital agriculture, also known as "smart farming" or "e-agriculture". The similarity between Industry 4.0 technologies and digital agriculture was highlighted by Zambon et al. (2019).

According to Pivota et al. (2019), the main obstacles preventing farmers from participating in Industry 4.0 concept are unreliable internet connections, especially in rural areas, and the amount of data to be entered into the system, for which smaller farmers are not properly trained.

Imran et al. (2021) draw particular attention to three major barriers to the implementation of Industry 4.0 in agri-food supply chains. The main obstacle (according to 80 % of survey respondents) is insufficient funding for investment in modern

technologies. Another limitation (67 %) is organizational inertia caused by employees' change resistance, lack of motivation and distorted awareness of technology benefits. The last barrier (57 %) is the poor sharing of resources between partners.

Seeing Industry 4.0 barriers from different angles, Stentoft et al. (2019) emphasize executive management's misunderstanding of the strategic importance of the 4.0 business model, and staff's ignorance of its principles, which requires further training. The authors also point to a lack of funds, skilled workforce and legal regulations, as well as poor cyber security provision.

The trend towards the knowledge society is reflected not only in the broader social context, but also in the required qualifications and the labour market in general. Fundamental changes in nature of work affect the organizational structure as well as the roles of employees and job descriptions requiring new skills. Employment developments are shaped by the above trends, too. The question of whether technological progress, especially automation, will lead to a net increase in unemployment is widely discussed. Until now, after completing retraining programmes, the unemployment rate has usually recovered, new jobs emerging. As regards the types of jobs that are likely to disappear due to automation, most research studies agree that routine work is most at risk (Flynn et al. 2017).

3 Methods

Primary data were drawn from semi-structured interviews conducted over the period 2019–2020. The method of qualitative sociological research was chosen for its flexibility, allowing to react to personal attributes of each participant. Following the prescribed instructions, the method made it possible to conduct in-depth well-arranged face-to-face interviews. The disadvantage, however, is the duration and psychological complexity; the interviewer is supposed to have a perfect knowledge of the issue and the ability to adapt to the interviewee. The questions covered the two areas (in modified variants for a given group of respondents):

- Industry 4.0 and human resources
- Perception of barriers to Industry 4.0

Interviews were conducted with the following three groups of respondents:

- Group 1 (GR1) – farm managers / team leaders
9 respondents participated in the research, all holding positions in top management – 2 each in livestock and crop production, 5 in mixed production. The criterion for their selection was experience in agriculture of more than 20 years. Their attitudes to and experience with the impacts of automation and other 4.0 solutions on production processes and the agricultural labour market were examined.

For a more comprehensive view of the issue addressed, interviews with respondents who have work experience in agriculture but are not management members were also conducted.

- Group 2 (GR2) – farm advisers (for production and administration)

7 respondents took part in the research – 4 for crop and animal production, 2 advisors-agronomists and a director of the Agrarian Chamber. All of them had agricultural consulting experience of over 20 years.

- Group 3 (GR3) – agricultural secondary school headmasters

13 respondents with at least 20-year experience in education related to farming participated in the survey.

The following three research questions were asked:

Question 1: What are the main barriers to the implementation of Industry 4.0 concept in agriculture from the respondents' point of view?

Question 2: How do the identified barriers differ from those reported in the literature?

Question 3: What impact do the elements of Industry 4.0 in agriculture have on human capital?

The information obtained from the interviews was processed using a smart software tool for qualitative data analysis and organization MAXQDA (version 18.2.5).

4 Results and discussion

Of the total number of respondents, 58 % are aware of Industry 4.0 concept, 49 % being actively engaged in it. 45 % of respondents admit that they know the idea superficially, mainly from the media, 29 % not knowing it at all. Those who are familiar with Industry 4.0 most often refer to the use of advanced technology (15 respondents) and GPS and sensors (15).

84 % of respondents believe that there are human work activities that cannot be replaced by robots. Especially livestock farming will still require a "human touch", e.g., in insemination and animal health control. (As one interviewee put it, "new technologies can make work easier, but a robot won't cure an animal".) The introduction of 4.0 technologies may, however, improve the image and attractiveness of agriculture in public. According to the respondents, greater promotion and awareness among young people in particular would help.

Respondents who are not familiar with Industry 4.0 concept cite lack of interest in adopting new technologies, especially if there is no reason to make changes in the established procedures. This is the way the respondents working in crop production think, not enjoying the benefits of automation that are evident in livestock farming.

The headmasters of agricultural secondary schools (GR3) state that they have been dealing with the concept for one to four years, outsourcing lectures, using practical examples, and incorporating information about technology advances operatively in classes. 36 % of head teachers say that they have modernized their school farms. As barriers to Industry 4.0, they recognize the complexity of Industry 4.0 agenda, considering the lack of student interest and poor funding for the acquisition of advanced educational facilities and equipment.

53 % of GR1 respondents report that they have been implementing automation elements for more than ten years. (One participant said that they had been driving automated processes on their farm for about two decades. As an example, he cited air conditioning computer control in stables – automatic fan starters and ventilation openers – which is no longer perceived as something innovative.) Among Industry 4.0 technologies, respondents mention GPS-controlled precision sowing, fertilization, care and harvesting of crops, as well as technologies for operating a weather station, monitoring nutrition and livestock conditions, and automatic feeding. ("Layer poultry farming, broiler fattening, and pig farming are far more advanced in terms of automated machinery than other agricultural production. Due to the long-term development and improvement, automatic feeding, ventilation, egg collection and manure removal systems work very well", one participant boasted.)

4.1 Industry 4.0 and human resources

The majority of GR1 respondents answered positively the question whether automation/robotics has already proved its worth in their respective farm establishments. One of the most common motivational effects of pursuing Industry 4.0 agenda, confirmed by 60 % of survey participants, is the successful recruitment of new labour force. Nevertheless, despite the increase in salaries, the same percentage of respondents remain sceptical about the number of suitable staff available in the future, especially in the lowest positions in rather unpopular livestock farms. It is thus understandable that respondents

mostly claim that they would not dismiss workers due to their "redundancy", but would try to find an appropriate retraining course and/or another job for them. (The above-mentioned trends may be affected by the persisting unflattering public sentiments about and prejudices against farming.)

35 % of GR1 respondents, on the other hand, state that it is the declining attractiveness of (i.e., the growing lack of interest in) working in agriculture that forced them to seriously meet the challenge of introducing labour-saving robotic systems.

ICT has become part of every industry including agriculture. The assumption prevails that the more complex the technology, the higher the requirements for more comprehensive staff training. (Managers, however, are realistic, knowing that, as one respondent put it, "there are still workers who are afraid to touch a computer". For the older generation of farmers in particular, digital technologies remain a deterring factor.)

Despite the objective reduction in the number of agricultural workers, all GR1 respondents agree that the human factor is crucial as not all farming activities can be fully automated.

The two remaining groups of participants also commented on the issue of labour shortages and interest in 4.0 technologies. Agricultural advisers (GR2) admit that the high motivation to introduce innovations is given by their perceived objective need. Along with the labour unattractiveness of agriculture, the problem seems to be the high cost of the latest technologies and their complex administration. Respondents expect that robotics has a future in livestock farming in particular, while in crop production technologies help more with navigation. (Milking robots and feeding machines in the former, and advanced field mechanization in the latter sector, e.g., precise sowing, spraying, and fertilizing, are already a commonplace.)

Both GR2 and GR3 respondents agree that farm enterprises are switching to automation and robotization due to the lack of suitable manpower in the labour market, the recruitment of new staff and retention of skilled workers posing a key personnel problem (Urbancová and Hudáková 2017). Secondary school headmasters argue that the improvement in the qualification structure of agricultural labour force ultimately depends on an overall increase in graduate levels. Naturally, quality teaching of Industry 4.0 principles is a prerequisite for their successful application and ensuing long-term cost savings, which are an important motivational factor driving technology modernization. 93 % of survey participants acknowledge that technology adoption requires skilled labour, the ability and willingness to embrace state-of-the-art technologies being a prerequisite for effective digital transformation. The minimum standard, in general, is secondary education. Employees with an inadequate level of education can undergo the necessary training, which may cause problems especially for older workers. Manual work is supposed to be taken over by robots.

4.2 Industry 4.0 implementation and its barriers

According to the respondents, weather fluctuations and difficult-to-predict natural phenomena are objective obstacles to the implementation of Industry 4.0 project in the crop cultivation sector, while in livestock farming, there are concerns about special pressure group interests or energy outages and subsequent data losses. However, the survey participants are most concerned that "digitization" will erode the life-giving connection with the soil and farm animals. (As one of the interviewees emphatically put it, "if a cow gets sick, will a robot cure her? When she starts limping, will it cure her? There must still be a vet technician. It won't work without a human touch.") School head teachers share the concerns of agricultural managers that Industry 4.0 threatens to depersonalize and "over-engineer" agriculture which may lead to the alienation from nature with its environmental implications. They are also afraid of rising unemployment and a shortage of skilled workers, as well as farmers' dependence on external services resulting in increased production costs not covered by subsidies.

Investments in robotics will be effective if the sales of products made by robots are sufficient, half of GR2 respondents believe. ("There is a lack of funding to modernize the whole sector and, moreover, the urban dwellers' opinion persists that the farmers are only 'recipients' of subsidies who produce toxic foods that are therefore not sold," argues one respondent.)

According to the survey participants, in addition to high financial demands, the implementation of Industry 4.0 solutions is limited by interest group pressure on "industrialization" and unpredictability of weather conditions affecting livestock and crop farming, respectively. Other feared factors are possible power outages and subsequent database corruption. The greatest concern, however, is the separation from the living base of farming, replacing immediate careful contact with soil and farm animals by looking through a computer monitor.

In detecting barriers to 4.0 technologies, the present survey is consistent with the literature, highlighting the financial demands and cybersecurity (fear of losing data). Unlike other sources, respondents mention weather dependence and loss of contact with the farming environment (human touch is irreplaceable, especially in livestock production) more often.

As 90 % of respondents agree, agricultural enterprises are forced to meet challenges of Industry 4.0 – automating, digitizing and robotizing farming production – to compensate for the current shortage of labour.

5 Conclusion

The aim of this paper was to identify the obstacles to achieving the goals of Industry 4.0 in agriculture with a focus on human capital. Semi-structured interviews were conducted with a small sample of respondents available. While in the secondary manufacturing sector of the economy the potential and limits of Industry 4.0 are already being examined in detail, for the primary sector, including agriculture, its barriers are still insufficiently defined.

The majority of all the three groups' representatives of agricultural enterprises, consultants and schools admit that the current labour shortage forces them to adopt Industry 4.0 solutions, human labour being too expensive and therefore prone to be reduced. Moreover, automation, robotics and overall digitization of production create a more efficient and friendly work environment for employees, and the potential for higher profits for employers, respectively. The jobs of the future require both technologically and socially skilled candidates (Grodek-Szostak et al. 2020).

Respondents consider the loss of human contact with farming to be the biggest barrier to the introduction of Industry 4.0 technologies in agriculture. The other most common concerns are the pressure to further mechanize livestock production, more frequent energy outages and data losses, high financial costs and, finally, unpredictable natural effects on crop production.

The statements of farm representatives that were agreed upon by other respondents concern the general shortage of labour and a specific lack of interest in hard work in farming, which is related to the shared view that technology might improve its unattractive public image. The prevailing opinion is that animal production will continue to require a "human touch" that will remain a prevention of "technological alienation" and the consequent loss of contact with the living substance of agriculture.

Further research could be extended to develop a more inclusive approach to barriers to grasp technological opportunities that Industry 4.0 offers to agriculture both in the Czech Republic and abroad.

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LABORATORY-SCALE PLANT FOR SEED GERMINATION AND PLANT DEVELOPMENT MONITORING

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Abstract: Generally, R&D works urge researchers to create their own laboratory equipment. The paper describes an approach to creating a laboratory-scale plant which allows tests germinating ability of seeds by two methods and monitoring the plants growth progress further while modeling various ambient conditions. Based on patent information retrieval conducted, analysis of scientific and technical literature, and systemization of the selected material, the technical design assignment was worded. As a result of the comparative analysis performed using the method of function, structure, and technology analysis and synthesis of technical solutions, the laboratory-scale plant design has been developed which is up to all the set requirements. This laboratory unit design is distinguished by its versatility, low cost, simple structure, accessibility of materials employed, and it does not need any utility connections.

Keywords: training equipment, germination table, germinating ability of seeds, quality of seeds, Jacobsen method, Rodewald method.

1 Introduction

Classically, at educational institutions, laboratory works are viewed as the major tool to form practical abilities and skills in students. So, I. Yu. Ermienko and A. V. Struchkov (2018) note that when studying general engineering and special subjects, laboratory classes allow comprehending the covered theoretical material more profoundly and ingraining it more deeply, and the quality of knowledge depends on obtaining valid results of experimental studies confirming the theoretical knowledge. A. A. Isaev, I. A. Sabanaev, and A. V. Dmitriev (2013) indicate there are two approaches to providing educational institutions with specialized laboratory equipment: purchase of commercial equipment and in-house development of the laboratory setup. However, as pointed out by A. A. Shapovalov and L. E. Andreeva (2018), currently, most equipment for general laboratory works and practical classes in physics still contain classical measuring devices and do not enable students to master modern sensors of physical values, software and hardware complexes. Hence the authors conclude that to solve problems associated with repeatability of laboratory works and outdated equipment, students can be engaged into designing their experiments according to certain scenarios. O. P. Matveev (2016) notes that the most valuable equipment is one that can be used not only for completing scheduled laboratory sessions but also for students' research activities carried out within end-of-year and final qualification works. As an example, the laboratory unit developed by postgraduate student S. Yu. Lupov and master degree student E. P. Fradkina (2009) for the "Digital signal processing" training course can be cited.

Generally, the existing laboratory equipment is designed for highly specific tasks and a limited set of operations, and its price is frequently higher than that of similar industrial plants due to it being manufactured in small lots. As a result, due to their limited budget, far not every educational institution can afford equipping its laboratories with professional laboratory-scale systems. Meanwhile, the use of industrial plants at educational institutions for the purposes of training students and conducting experimental research is associated with a number of difficulties, such as complexity of connecting them to utilities of the laboratory. Alongside this, industrial equipment features considerable dimensions, and its performance and resource (water, electric power, etc.) consumption are outsized for the purposes of experiments.

Patent information retrieval conducted to find out the technical development level of seed germination methods and

development trends of industrial and laboratory equipment for starting seeds and subsequently monitoring the growth progress of sprouts has shown there is considerable potential as for creation of multi-purpose laboratory equipment. Such systems must incorporate a combination of several methods for germination of seeds, as well as the option of monitoring development progress of the resulting sprouts within one piece of equipment.

Creation of in-house laboratory equipment by own resources of an educational institution solves several problems at once:

- it allows engaging students into practical work and thus consolidating their theoretical knowledge, practical skills, and abilities received during training;
- it helps setting up interdisciplinary communication of students from different focus areas of training (designers, mechanical engineers, production engineers, operations specialists, electrical engineers, and so on);
- a plant targeted at solving specific research problems can be obtained with the least possible material resources;
- it makes possible for the educational institution to equip its laboratory with a plant which can be modified for new tasks later, as the institution keeps all drawings, diagrams, microcontroller firmware source code, and any other information pertaining to creation of the plant;
- it enables the educational institution to expand its laboratory equipment stock.

All the above makes the topic of the paper relevant. It describes research conducted at Petrozavodsk State University as a result of working on creation of a new versatile design of a laboratory-scale plant. The plant allows germinating seeds by two different methods – the Rodewald and Jacobsen ones, – as well as monitoring development of seedlings with an option of modeling various ambient conditions.

2 Literature Review

Graduates will succeed in studying features of specific industrial units and mastering their use even on the job, if they have a solid knowledge of theory and practical skills. Among other things, to gain such skills in terms of evaluation of the quality of planting material, students of forestry focus areas of training need modern laboratory-scale systems enabling them to not only germinate seeds, but also monitor further development of the plants.

As noted by O. I. Gavrilova, K. V. Gostev, and M. V. Zhuravleva (2015), there are numerous seed germination methods: germination in bags, germination in a sponge, germination on paper towels in inclined containers, as well as the frequently observed methods of germination in Petri dishes, boxes, or other vessels. However, the most broadly used seed germination methods are the ones involving special devices termed germination tables. For example, this kind of equipment using the Jacobsen method is used in forestry seed stations for seed control. UN FAO guide to forest seed handling edited by R. L. Willan (1985) lists recommended equipment to test seeds for germinating ability, too, among which Jacobsen and Rodewald type apparatuses and germination chambers are mentioned.

The Jacobsen method is approved by the International Seed Testing Association (ISTA); it allows starting seeds on special circular paper filters (Jacobsen Germinators, 2022). The paper filters are placed on the germination plate (a special slotted plate) under which there is a water basin with heated water. The filters make up spirals with wicks reaching into the basin and supplying moisture to the seeds. Seeds placed on the paper filters are covered with tapered glass hoods; above the germination plate, there are lamps for lighting the seeds. Thus, when starting seeds with this method, one can control all principal conditions

of germination: humidity, heat, and light (The BCC Germination Table, 2016).

The Rodewald method, which is also approved by ISTA, is another widespread industrial method for checking seeds for germinating ability. It is used successfully for forest and agricultural seeds in tasks when the probability of seed fungal infection risk needs to be lowered (Rodewald Germinators, 2022). The Rodewald method implies placing paper filters on a tub filled with silica sand. The sand tub is located above a temperature-conditioned water basin. So, seeds get wetted via the silica sand, and there is a transparent hood covering them to prevent the sand from drying. With its special design, condensate water does not drip into the sand, and the transparent hood can be opened for ventilation as required.

Body parts of industrial Jacobsen germinators are manufactured from stainless steel. The main elements of such germinators are: stand, water basin, and seed germination tubs. Inside the stand, thermal control water circulation system components are located: the heat exchanger tank with its tubular electric heater and cooling plant, circulation pump, solenoid valves, and the control unit (PLUS.271266.001RE "APS-1 Germinator. Operation manual", 2018). More advanced systems are designed with fine trunk and circulation water filters, and their control units have archive memory functions for storing temperature parameters and a PC connectivity option for information exchange. To maintain the required water level in the basin, industrial germinators are usually connected to water supply and sewer utilities systems of the building.

In the Jacobsen apparatuses, an important experiment repeatability condition is the precise maintenance of the water level in the basin, which is exactly what was demonstrated by S. K. Kamra (1968) using pine tree seeds. Industrial systems have an overflow pipe to set up the accurate water level. Current regulatory documents specify that the water level in the germinators has to be maintained 2-3 cm below the seed germination plate (GOST 13056.6-97, 1998).

In all industrial germinators, the temperature of seeds is maintained by heating the water in the basin. The accuracy of water heating is controlled by water temperature sensors. However, regulatory documents require maintaining not the water temperature but that of the plate where seeds are located at a certain level. To improve the temperature maintenance accuracy, modern devices use special side-mounted temperature sensors placed just under the paper filter (Operating and maintenance instructions for Jacobsen germination table, 2001); these allow setting up the unit more accurately. As for the control system of modern germinators, it allows creating several control profiles, specifying daily and weekly cycle of switching on heating and temperature maintenance, as well as the pattern of lamps being turned on for lighting.

Anyway, the capacities of industrial germinators designed for a large number of samples loaded simultaneously are outsized for the tasks of conducting student laboratory and scientific research works. So, industrial Jacobsen apparatuses can hold up to 120 samples and more at the same time. Meanwhile, to train students, a compact and affordable structure which can fit into a classroom is needed.

T. Sizmur, K. R. Lind, S. Benomar, and H. Vanevery (2014) note that germination tables are expensive, they provide equal conditions for all samples, which is not always good for research, and they are not suitable for studying roots even though germinated seeds are usually transplanted during studies. This is why they suggest a simple and inexpensive test unit for germinating and studying development of roots which provides controlled humidity and contact with the required nutrients for each seedling. Another inexpensive and affordable design for germinating grapes is suggested by S. Larsen and J. Bruce (2022). It is based on a commercial plastic box of around 70 liters volume, and heating is performed by a conventional

incandescent bulb. There is a fan and reflector used for more uniform heating; they also protect the plastic box cover from the overheating hazard.

Sometimes, drying chambers with Petri dishes are used as seed germinators; for example, O. Gonzalez-Lopez and P. A. Casquero (2014) used the chambers to study germination of food culture seeds successfully. Scientists put forward technical solutions to improve current designs, too. So, D. M. Alm, R. A. Garves, E. W. Stoller, and L. M. Wax (1997) suggested using a special germination cabinet with 16 separate chambers containing 15 Petri dishes each. In all chambers, the temperature is measured independently, and the temperature is changed and monitored by the computer.

As Russia's forestry is oriented to the use of root-balled seedlings in forest renewal, another task for the system in question can be to study development of plants. For example, at forest nurseries, to find out the quality of seedling roots and to check the roots for defects, they use special tables for test germination of roots (PGC (PRK) table for test rooting of seedlings, 2022). However, simpler designs of equipment for studying the growth of roots are known. So, M. A. Raikes (1936) suggested a simple structure in the form of a bucket, with water filling a special ring-shaped recess along the perimeter and the wet chamber covered by a transparent lid with a pluggable opening through which water can be replenished. Seeds are placed on special filter paper strips, the top ends of which are dipped into the water-filled recess.

Simple plant growing structures are offered, too; for example, Around Home Creations LLC suggested a design for growing vegetable cultures from seeds in which lighting is provided for seeds and sprouts, and so is heating by heating mats (Build a Seed Starting Rack, 2022).

3 Research Methodological Framework

The objective of this paper consists in developing a laboratory-scale plant which allows both germinating seeds and monitoring further development of seedlings.

The following were outlined as the research tasks:

- to conduct patent information retrieval in relation to known state-of-the-art seed germination systems;
- to analyze known designs in terms of highlighting their advantages, disadvantages, and operational capacities;
- to identify requirements for the laboratory-scale unit being created;
- to suggest an original design of the laboratory-scale plant ensuring both germination of seeds and monitoring of their further progress.

When completing the set tasks and achieving the objective, the following methods were used:

- patent information retrieval and analysis of scientific and technical literature with subsequent systemization of the material collected;
- the comparison method which allowed finding out distinctive features of the designs and methods in question and revealing their advantages and disadvantages in certain operational conditions;
- the method of function, structure, and technology analysis which allowed viewing the studied equipment from various viewpoints, more specifically, in terms of their functional capacities, structure, materials used in the design, design solutions applied, and from the viewpoint of effectiveness of its use in various process chains;
- the method of synthesis of technical solutions which allowed suggesting new technical solutions concerning the structure, design, and tooling of the laboratory-scale plant being created.

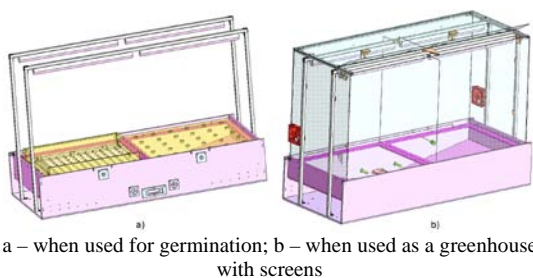
4 Results and Discussion

As a result of the patent information retrieval and analysis of scientific and technical literature conducted, the information was collected which allowed finding out the technical development level of equipment and technologies in relation to seed germination equipment and that for growing plants from sprouted seeds. Systemization of the collected information enabled the authors to word the technical assignment for developing a new design of the laboratory-scale plant with extended functional capacities, taking into account development trends of similar equipment.

Comparative analysis of known technical solutions allowed identifying distinctive features of various designs of seed germination units and the plant growth progress monitoring ones, as well as methods used in them. Their advantages and disadvantages in certain operational conditions were analyzed, too.

As a result of the work, it was decided to create an original laboratory-scale plant design which will ensure employing both Jacobsen and Rodewald methods in one unit for laboratory and student scientific research works in germinating ability of seeds. Moreover, the design in question has to feature quick transformation of the germination table into a small training greenhouse for laboratory and scientific research works in monitoring development of plants (experiments of pilot growing of timber species to identify the quality of seedling roots, etc.). On top of this, the laboratory-scale unit must feature ease of installation and need no connection to utility networks of the laboratory for operation. The resulting design is shown in Figure 1.

Figure 1 Structural elements of the laboratory-scale plant



Source: compiled by the authors

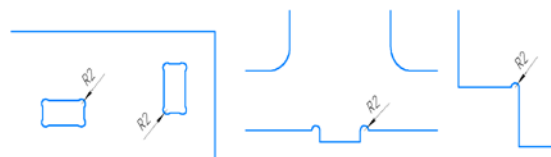
The design in question belongs not to industrial setups, but to laboratory-scale training units, so some design and technological solutions have been adopted to make it simpler and cheaper. These solutions will not limit the capacities of the germination table for training and conducting student scientific research works.

So, if the number of simultaneously loaded samples is decreased up to 60 pcs for working with the table according to the Jacobsen method, it becomes possible to markedly reduce weight and size of the structure and even to install it on a standard classroom desk.

In industrial plants, stainless steel is used, but this is an expensive material which is also hard to process in conditions of university workshops: for machining it, special tools and correct machining rate selection are required. The process of welding stainless steel is markedly more difficult, as compared to the carbon steel. The use of carbon steel in design could have made the unit evidently cheaper and could have simplified its assembly; however, susceptibility to corrosion makes it unacceptable to use carbon steel for manufacturing a basin to be filled with water. So, it was decided to opt out of steel in the body structure and use sheet polypropylene as the basin body material instead. Polypropylene is a safe and easy to wash material which is not ruined by the humid environment and can survive the 40-45°C temperature required for germination. Calculations have shown that a 10 mm thick polypropylene sheet

allows getting the required strength and rigidity of the unit body while keeping the structure weight acceptable. The university workshops dispose of a CNC (computer numerical control) milling machine with a large table, so the design development proceeded from the objective to fit all body parts into a 1500x3000 mm sheet. The milling machine is used for cutting parts and making blind mortises. The structure parts are assembled with the mortise and tenon method. Initially, design of the plant parts accounted for the 4 mm diameter machine cutter, so dogbone fillets were made in the inner corners of the mortises to compensate for the cutter, and the corners of corresponding parts were slightly cut up (see Figure 2).

Figure 2 Cutting plan details for assembly from sheet material



Source: compiled by the authors

For bending parts after cutting and their subsequent assembly, it was decided to use a hot air gun and a special welder for 4 mm diameter polypropylene rods. The CNC milling machine, rod welder, and laser-cutting machine are shown in Figure 3.

Figure 3 Machines for making the body and screens of the unit



Source: compiled by the authors

For the transparent screens of the plant, acrylic sheets 3 and 2 mm thick were selected as the material. Parts were cut from the sheet with the CNC laser-cutting machine. The screen elements are quick detachable, which allows converting the seed germination table into a small training greenhouse easily and monitoring the growth of plants after their germinating from seeds.

More specifically, the conversion implies mounting vertical side screens fastened by magnets on grow light posts. After that, the top screen is installed and secured on the posts with wing nuts. The top and side screens have hatches, ventilation fans, and additional sensors. The front and rear screens are hung up on the top screen profile; they can be removed in one go if plants need care. The greenhouse space can be separated with a vertical divider in the middle as required.

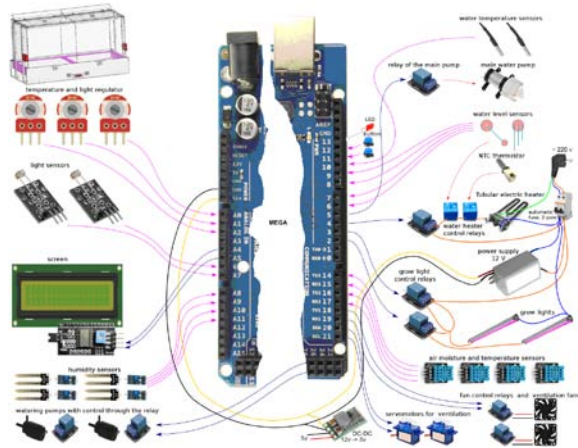
For automating the work of the plant and controlling the operation of sensors, it was decided to use the Arduino platform which is relatively easy to program and has a broad range of expansion boards to choose from. E. Ya. Omelchenko, V. O. Tanich, A. S. Maklakov, and E. A. Karyakina (2013) note that Arduino is perfect for designing various mechatronics systems and robots, as well as for solving more sophisticated technical automation problems. V. S. Lobodinov, S. R. Pan, I. V. Pugachev, V. N. Trofimenko, and Ya. N. Tuzko (2019) point out that accessibility and relative simplicity of launching Arduino platform-based projects allow successfully designing training plants for laboratories.

The Mega platform based on the ATmega2560 microcontroller from the Arduino family was selected for solving the automation problem for the plant being designed. The Mega platform is compatible with the most popular one, Uno, but it has a clearly larger number of digital and analog inputs/outputs, with extra memory volume at that. So, the choice of Mega results from the Uno platform lacking digital and analog inputs/outputs to

connect all the required sensors and actuators of the laboratory-scale plant in question.

It was decided to use a tubular electric heater, grow lights, a water basin level pump and watering pumps, servomotors of hatches and ventilation fans as principal actuators. The plant design incorporates water and air temperature sensors, air and soil humidity sensors, illumination sensors, and water level sensors. To control the plant, buttons and variable resistors are used, and its work is monitored by readings of the screen and indicator LEDs blinking. The plant is connected to the computer through a USB port. All digital components are located in several standard IP55 class distribution boxes for electrical use. The boxes are installed in recesses of the plant body formed by the inclined basin walls. Plastic seats with holes for fasteners were designed and printed with a 3D-printer for fitting the electrical components into the distribution boxes more conveniently. The diagram of connections is given in Figure 4.

Figure 4 Circuit diagram of the multi-purpose training table



Source: compiled by the authors

Software for the platform was developed using Arduino IDE, and the utility for saving the data from the platform to the PC hard disk was developed using the Qt framework. The computer software can work both in the console mode and in the graphic user interface one. It also features the simplest WEB-server capacities, which allows viewing the information from the platform via the local area network.

5 Conclusion

As a result of the work, based on studying the technical level and development trends of methods and devices used in exploring the seed germination process and in monitoring the growth progress of sprouts, the original design of a laboratory-scale plant was suggested. Development of the laboratory-scale unit design included the entire cycle of design operations: elaboration of technical assignment, design of structural elements proceeding from the materials to be used and technical capacities of the university's industrial equipment for manufacturing them, selection of electric and digital components, development of specialized software and hardware complex for controlling operation of the plant. In relation to a number of technical solutions used in the developed design, the authors have applied to the Federal Service for Intellectual Property (Rospatent) to register industrial design rights as utility model and design patent applications. A certificate of computer software registration has been obtained, too (certificate No. RU 2022667914 dated 28/09/2022).

The developed laboratory-scale plant design features a compact size, low manufacturing cost, ease of operation, as well as versatility. The latter consists in the opportunity to germinate seeds in two methods, the Rodewald and Jacobsen ones, and monitor further development of seedlings after minor conversion.

Thus, all outlined tasks have been completed, and the set objective has been achieved in the course of the work.

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Secondary Paper Section: GE, JR

I INFORMATICS

IN INFORMATICS

BOLSTERING DEEP LEARNING WITH METHODS AND PLATFORMS FOR TEACHING PROGRAMMING

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Abstract: After decades of effort informatics and programming are part of the high school curriculum in Slovakia. The demand and popularity of IT impacts the education and continuously conquers space. Nowadays informatics is present from primary schools in the examined region. Although the students are more exposed to IT compared to previous generations learning programming offers numerous challenges for the beginners. Our goal is to streamline and deepen the learning process by evaluating the learning habits and observe the usage of a newly implemented platform. To improve the understanding of the currently prioritised learning styles we combined the advantages of survey with more direct interview methods. Based on the multilateral data collected from students' and teachers' perspective we provide methodological recommendations on improving the programming education to facilitate deep learning.

Keywords: deep learning, Jupyter Notebook, JupyterHub, notetaking, computer science, programming

1 Introduction

With the introduction of Information Technology (IT) as a school subject, Slovakia faced new challenges. The integration of IT to the educational curriculum was welcomed by students and teachers alike because of the rapid development of technology the basic computer skills turned into expected ones. Despite the positive reception teaching and learning IT, especially programming, has its own challenges. The content of the IT subject is constantly changing which makes suitable teaching materials hard to find. In addition, not all teaching methods seem suitable for this subject. IT is an umbrella term which can cover everything from basic computer skills to programming in a specific language. The study deals with the challenges of teaching and learning programming from beginner level, introduces an old new platform in the university environment and presents the results based on the data collected. The remainder of the paper is organised as follows: Section 2 introduces the implemented research methods and local situation. Section 3 outlines the desired learning outcomes and details the Jupyter ecosystem. Finally, Section 4 contains the results of the qualitative and quantitative data collected.

2 Methodology

The primary tool of the research was a questionnaire consisting of 21 questions which included 3 main sections besides the introductory demographic questions. The sections provided insights to students' learning habits in general, the involvement of notetaking throughout learning programming and finally their opinion towards the newly implemented JupyterHub service. The questionnaire was limited to the attendees of informatics-related studies and the responses were collected during summer and winter semester of 2022. The summer semester granted 50, while the latter 55 valid responses. The questionnaires ended with a voluntary prompt if the respondent would have liked to participate in a more detailed interview regarding the same topic. The mentioned interview was carried out with student and teacher participants after the evaluation of quantitative data.

3 The implemented teaching workflow

The content of informatics (or subjects dealing with informatics) taught in the schools of the examined regions is constantly changing and expanding. (Paksi, Csóka, Annuš 2022) In the last decade, teaching of programming received a lot of attention, computers became essential parts of our civilization and are present nearly everywhere. In order to keep up with the demand

and the rapid expansion of technology the field of information technology gained its own school subject version. One way or another it is present in the teaching materials from primary school age. (Végh, Takáč 2014) Depending on the region, knowledge of a descriptive programming language is becoming more common while high-level programming language is already expected at secondary school level. These are accompanied by a relatively low number of lessons, on average 1 lesson per week. (Paksi, Csóka, Annuš 2022) Due to these restrictions and ambitious objectives, there is great demand for effective teaching of the curriculum which can facilitate fast learning and deep understanding. If the mentioned goals are not fulfilled, the teaching process fails. The small number of lessons combined with the high amount of educational material in the field of programming often peaks in superficial knowledge or completely omitted topics. (Willis, Charlton, Hirst 2020) The problem is also present at our university. The Applied Informatics study programme shows a high number of attritions which got even worse when the students who graduated during the pandemic began their university studies. Our goal is to explore the root causes and reduce the student non-continuation rate by improving the learning process with tools and methods. (Czakóová, Stoffová 2020) In order to overcome the obstacles of programming there are a lot of teaching methods and approaches available, but not all of them are suitable for the above-mentioned requirements. (Végh, Takáč 2016), (Ilter 2017) The cornerstones of the solution we developed for teaching programming are based on the deep learning teaching approach and the Jupyter note-taking platform (Sáiz-Manzanares, Consuelo, García, César, Díez-Pastor, Martín, Luis 2019). To evaluate if the solution is applicable and effective, first let us look at the pillars.

3.1 Deep learning with notetaking

Almost five decades ago Marton and Säljö discovered the two different learning processes. (Marton, Säljö 1976) Surface learning refers to rote learning and memorising the text. Deep learning refers to meaningful learning and to understand the text's meaning and significance. (Choithram, Suwimon, Nonglak 2014)

Understanding and thinking are the basis of a deep learning method. It is defined as a significant understanding of the basic content waiting to be mastered, accompanied by critical thinking and the ability to solve problems. These core competencies are joined by collaboration, communication, and the ability to control one's own learning. The possession of positive beliefs and attitudes about oneself can motivate continuous learning. (Paksi, Csóka, Annuš 2022), (Czakóová 2020)

The essence of the approach is the in-depth study of a given topic. An excellent tool for encouraging the favoured behaviour is a notetaking platform where the users can take notes, run, and experiment with program codes at the same time. This is supported by the (Dong 2021) study, where it was discovered that the data scientists who used notebooks kept continuously adding more and more lines of code to their notes, thus they were able to experiment and propose alternative solutions. In the beginning similar platforms were developed for professional usage, for example in the field of data science. (Zhong, Wei, Yao, Deng, Wang, Tong 2020) The arrival of computational notebooks and their functions satisfied demand in the industry. Nowadays such products are more widely known and thanks to their favoured properties the inclusion to education gradually began. (Asikainen, Gijbels 2017), (Czakóová, Udvaros 2021)

Bruner's Spiral curriculum also fits to the mentioned concepts and to the nature of programming. Spiral curriculum is a design where the key concepts are not just presented, but often reintroduced throughout the curriculum. Every reappearance of

the familiar concepts gradually increases difficulty. (Bruner, 1960)

3.2 The Jupyter Ecosystem

Project Jupyter started as the successor of the notebook interface parts of the original IPython (Interactive Python) platform. IPython was originally developed as a command shell for interactive computing but over the years as the project got more attention, the original developer decided to move some functionality under a new name thus creating a clearer distinction among the solutions. (Csóka 2021)

Jupyter Notebook is a web-based interactive computational environment and as the name suggests it is for creating programming-oriented documents. It is capable of running codes, displaying visualisations and handling markdown text in one place. To achieve this, they use their own .ipynb file type, which nowadays is supported by many popular IDEs (integrated developer environments). The application supports Python, Julia, R languages out of the box, but the functionality can be further expanded by installing additional kernels (programming languages), which we previously prepared and tested. (Paksi, Csóka 2022)

JupyterLab includes all functionality of Jupyter Notebook, adds a modular interface to create experience similar to IDEs and the possibility to install extensions. Furthermore, added features like better handling of .csv files and other improvements make it favourable. (Lee, Lan, Hamman, Hendricks 2008)

The idea of visualisation and interactivity in education is not new at all. It helps to interpret complex information and find relations between data. (Svitek, Annuš, Filip 2020) (Czakóová 2019)

JupyterHub is a server-side, centralised solution usually running on high performance resources. Table 1 compares key features of selected platforms. It is intended to deliver multiple clients the same environments and kernels set up by the hosting institute, or organisation. From users' perspective the process is drastically simplified, their only task is to open the institute's JupyterHub website and log in. Upon successful authentication the users land on the familiar Jupyter Notebook or JupyterLab menu which was set up by the provider of the server. The operation and maintenance of such service requires advanced skills. The appointed people with necessary experience are capable of finetuning most aspects of the service, installing the necessary extensions and kernels globally or individually. (Siegel 2018)

Table 1 - Comparison of available programming platforms

	Visual Studio Code	JupyterLab	Google Colaboratory	JupyterHub
Multiple clients	✗	✗	✓	✓
Centralised	✗	✗	✓	✓
Multiple programming languages	✓	✓	✗	✓
Automatic grading	✗	✓	✗	✓
High customisability	✓	✓	✗	✓

In our region it is customary and expected that the students are going through summative assessments where their performance and work are expressed in grades. From teachers' perspective there is a constantly growing demand to make and improve the reliability, validity, and speed of the evaluating process. Regarding assessment of programming there are two main groups present in the region. The representatives of the traditional method are assessing the students by solving the practical programming test with pen and paper. This approach helps to pinpoint knowledge gaps during the correction process which can be supplemented with comments. Secondly, it

excludes a huge number of cheating or helping opportunities otherwise offered by modern development environments (IDE) and computers in general. On the other hand, representatives of the modern methods prefer to conduct the process digitally. From handing out the problems waiting to be solved to publishing the test results. In this case it is more difficult to attach comments to mistakes for every individual and ensure the desired pedagogical effect of the feedback. Another often missed opportunity by teachers is the omission of automatic test evaluation with the help of applications. In contrast to other subjects the nature of programming assessments made automatization more difficult but nowadays multiple solutions are available. Jupyter has developed an indirect solution to handle assessments. The platform by default does not include functions regarding assigning, collecting, and evaluating tasks. However, as the programming-oriented document editing environments began to appear in classrooms the demand for digital assessment solutions started to grow. Nowadays, there are many plugins, such as the nbgrader which we also tested (Paksi, Csóka 2022). In addition, we could also mention the Web-CAT, CourseMaker (Manzoor, Naik, Shaffer, North, Edwards 2020) and the UNCode Notebook (González-Carrillo, Restrepo-Calle, Ramírez-Echeverry, González 2021). Each of these tools approaches the problem differently and from a different angle, but they all have huge potential.

3.3 Local situation

Despite the soon two-decade-long history of the Project Jupyter the investigated university put it into operation experimentally just 2 years ago. JupyterLab and Jupyter Notebook solutions were familiar, but the on-premises feature of the JupyterHub made it favourable versus the simpler solutions (e.g.: installing a local JupyterLab client on every classroom computer). A similar online solution worthy of mentioning could be the Colaboratory by Google. However, the list of supported programming languages is narrowly limited and focuses mainly on Python. Our goal was to customise the platform in such a way that best serves the institute. The main reference used to accomplish the designated objectives was the Applied Informatics study programme, since it overlaps the rest of the programming-related training. At our university teaching takes place in many programming languages, such as Python, C/C++, C#, Assembly, MATLAB, etc. With JupyterHub the implementation of all the mentioned languages is solved in one place. By expanding JupyterHub with additional kernels we managed to offer a central platform capable of running the required languages, store files and enable the possibility of writing organised notes for programming. To further increase the convenience the users can login with their credentials provided by the university. Last, but not least it is important to point out that the long-term storage of files, lesson notes and source codes can be solved through this platform. Previously used solutions for file management by students included private cloud drives, self-addressed emails, external data storage devices, and other.

4 Results

The survey was concluded with the participation of 105 university students who attend either applied informatics or pedagogy programmes with an informatics major. The distribution of genders shows that these programmes appeal more to male students. The exact results are 89% in favour of male students. Although the questionnaire was shared with all the students of the mentioned studies, freshmen proved to be the keenest while a similar number of answers were collected from second and third years (Figure 1).

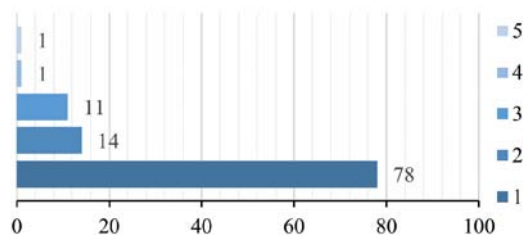


Figure 1 - Distribution of respondents by study level

The questionnaire focused on acquiring data regarding students' notetaking habits and the usage of the JupyterHub platform. At the time of the survey the platform was available for a year. Higher classes with more demanding, practical tasks could benefit less from the functionality of Jupyter. This caused a visible division regarding the platform's assessment. Next, we would like to highlight the cross results of two questions, "Do you take notes during practical programming lessons?" and "Do you recommend Jupyter?". Figure 2 can be interpreted as follows, the left side houses the negative answers regarding the first question, right the affirmation while the top side holds the positive answers for the second. Since the adoption of the platform is considered recent, we first grouped the respondents if they had used JupyterHub beforehand. The orange-coloured bubbles on the horizontal (X) axis show the respondents who did not use JupyterHub at all, therefore their notetaking habits were evaluated during the survey. Nearly 45% of the students stated that they had no previous experience with the program itself. However, the dangerous part appears on the left side of the figure, which represents the students who do not take notes by any means. As Figure 2 shows, more than half of the respondents stated that they do not take notes during programming themed lectures and neither take notes during learning programming.

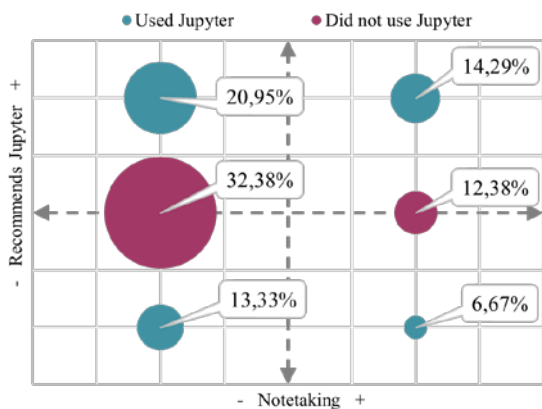


Figure 2 - Notetaking habits & Jupyter experience

We found that it is worthy to mention that 33% of our students started their university studies in the field of informatics without prior programming experience. This partially explains the high number of attritions and also shows that many students struggle to develop the necessary skillset to effectively learn the subject. The data supports our assumption that notetaking, as a valued student skill is not promoted and expected as before. The below figure (Figure 3) shows the ranking of 8 different knowledge sources based on individual preferences. The collected responses highlight the fact that students ranked professional literature and online courses frequently as the last options to study from. However, the top half of the ranking shows rather uniform distribution among sample tasks, teacher provided materials and online video sharing platforms. This arrangement of priorities suggests that students are mainly looking for quick, easy to understand and direct solutions for concrete problems. However, this attitude may obstruct the deep aspect of the learning process itself.

The sources can be further classified as internal and external sources. In this case we label learner and teacher created materials as internal (marked with a dotted pattern) and the rest as external. The data translated in accordance with the previous description supports (Rank 1 – 32%, Rank 2 – 39%, Rank 3 – 35%) our assumption that internally created teaching and learning materials are prioritised and valued.

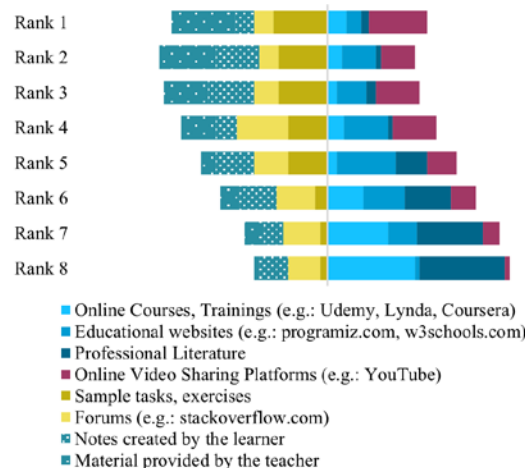


Figure 3 - Ranking of various knowledge sources

Despite the fact that programming language documentation and professional literature are among the most reliable foundations of programming these options are mostly represented in the bottom rankings. To add another perspective to the results we can group courses, literature, and educational websites as demanding sources of deep knowledge (marked with a blue colour). Ironically the mentioned trio is underrepresented in the top half of rankings.

Each section in the questionnaire featured a 4-level Likert scale with multiple statements. In most cases, students were asked about their level of agreement with the proposed statements: "Please indicate your level of agreement with the following statements", in which case the scale ranged from 1 = strongly disagree to 4 = strongly agree.

This first such question contained statements regarding learning habits. By applying clustering to the data 3 groups of learners were identified. With more than 50% the first cluster contains the most members who mainly prefer to learn alone and rather reject the group learning opportunities. The other two clusters are more open towards learning in small and large groups. The most divisive statement of the section was the last one, "I prefer explanations from similar aged". Although the majority of respondents answered with "likely" or "more likely", there is a clear separation among the created clusters.

The second Likert scale dealt with the students' notetaking habits (see Figure 4). With no significant difference between 3 and 4 clusters the presented results display the former. The gathered data suggests that about half of the respondents do not possess the necessary skill to create appropriate notes, however, majority of them are aware of the beneficial effects of notetaking.

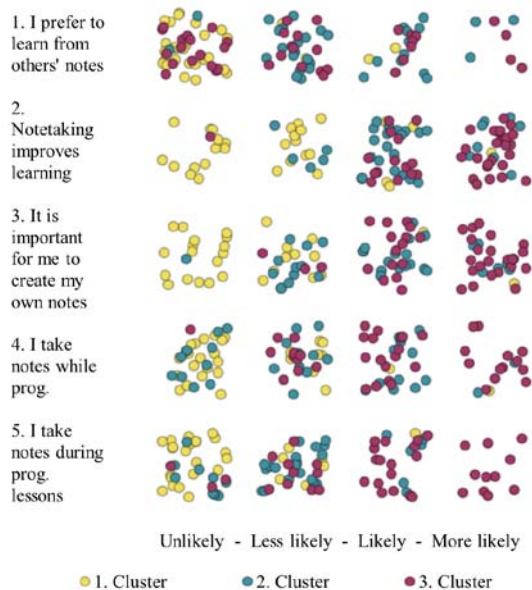


Figure 4 - Students' attitude towards notes and notetaking

The different learning approaches can also be clearly observed in Figure 4. The first cluster contains most of the surface learners, since they are the ones who do not take notes in class, not recognise its benefits. This cluster relies on third party notes, which in this case refers to notes provided by teachers and other students. The representatives of the third cluster we consider deep learners. They take notes in class and prefer to rely on them. Finally, the second cluster (green colour) collects the students who use notes during their studies, but do not invest time in creating their own. Some causes of this attitude surfaced during the interview.

The following question inquired details about preferred primary notetaking methods. The results showed surprising popularity of the less effective methods (marked with shades of blue on Figure 5). The results showed a tie between effective and less effective methods. No respondent marked simple text editors (Notepad, WordPad) as their primary choice.

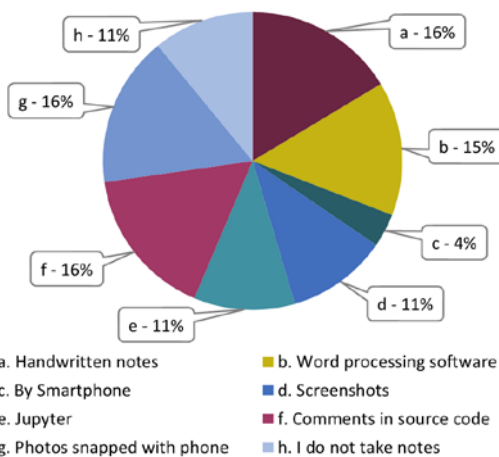


Figure 5 - Students' primary notetaking methods

Next, the frequency of preparation was asked where the respondents could choose their answer from "Regularly", "Sometimes", "Rarely", "Before exams" and "Never". The results show that only 16% of the respondents prepare regularly for classes and most of them occasionally (Sometimes - 37%). Nearly one fifth of the surveyed students stated that they prepare only for examinations. These results combined with Figure 6

show that a bad habit emerged among students which combines ineffective notetaking with irregular preparation patterns.

The last section of the questionnaire dealt with the JupyterHub user experience. Despite the service being available for a year at the time of the survey only 55% of the respondents reported that they are familiar with the platform. Despite the relatively small user base the respondents expressed positive opinions and only 15% were dissatisfied with the platform and its functions.

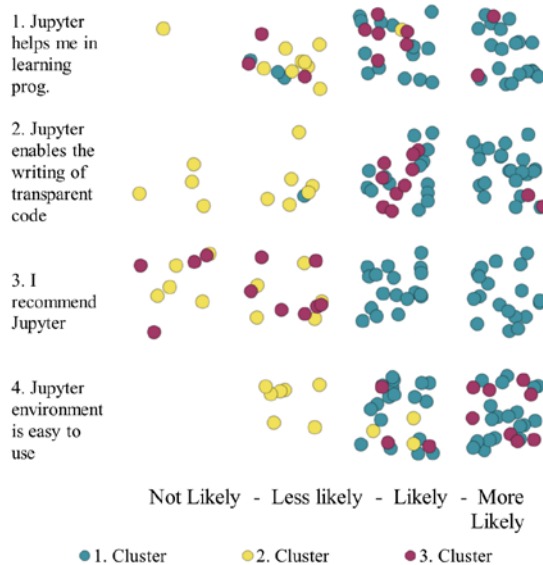


Figure 6 - Students' review of JupyterHub

Figure 6 displays the two main and lesser groups of Jupyter users. The representatives of the first cluster consider JupyterHub a useful addition to their toolset. The second cluster includes students who responded negatively and believe they will not find it useful throughout their studies. The third cluster turned out to be the most interesting. These students mostly share the opinion of the first cluster but in a more restrained way. However, they do not recommend the Jupyter to other students. Our basic assumption was that those who have a positive opinion of the platform will also recommend it. However, as the results show, for some reason the matter is not so clear. We found two possible explanations for the results partially supported by the interview. The first is that members of the third cluster have a positive attitude towards the platform but know or use a service that is more convenient for them. The other reason could be simply the nature of their personality. The available data was not enough to further determine the reasons behind the given answers.

4.1 Interview results

The interview part strongly connected to the questionnaire results and gave the asked opportunity to express their opinion in more details. The participation was voluntary. The first set of questions was related to programming experience gathered prior university studies. Most student responses were negative, mainly reporting the short amount of time secured to programming. However, they acknowledged high school as the main place for gaining programming experience and practising. The authors of the paper suspected that students do not prepare regularly for lessons. Sadly, this idea found support both in the questionnaire and during the interview. As a result of this attitude the learning process shortened and wedged in right before the exam. The reasons included two main factors, which were repeated about notetaking again: time and energy consuming. Another reason some respondents mentioned was that they considered notes provided by the teacher primary and unalterable, therefore they did not see any reason to write down the exact same note again. Finally, some students voluntarily admitted that they did not

think they had the necessary skills to point out the key information and take notes on their own.

In order to better understand the outcome of the data displayed on Figure 4 we attempted to further uncover the details. We asked the subjects to describe characteristics of good learning material. The most frequent answer was the time factor and quick success (solving a concrete exercise, e.g.: generate random numbers between 1 and 10) was preferred over comprehensive knowledge (understand how a function works and how to parametrize it, e.g.: generate random numbers on any given interval) of the given topic. Although this attitude is reprehensible, especially in higher educational environments, we think it is also a virtue of the current generation. The last questions focused on the shortcomings of the university JupyterHub server. Some students missed the high-level code completion features present in modern IDEs. While others missed the shared library and integrated file sharing functionality of Colaboratory.

Finally, the interview section ended with 3 teachers who are actively using JupyterHub during their lessons. We asked the participants open questions and let them express their opinion. First, we wanted to know their point of view on the importance of notetaking. The answers were divisive, since according to two respondents making notes was important. On the contrary, the third person stated the opposite and considered source codes appropriate. On the other hand, they all agreed that the majority of students have bad notetaking methods and skills. They pointed out the uselessness of students taking photographs of the projected material with phones. Respondents considered this frequent phenomenon useless and a waste of time, not to mention that most materials (presentations, notes, source codes, examples) are available for the students online. As a supplement to this problem, it was pointed out that the access of information and technology went through a huge development over the last decades. Some years ago, the best and only sources of information for students were the textbooks, professional literature and the teachers themselves. Nowadays every student owns devices capable of snapping high quality pictures and has access to the Internet. Although the necessary information came within reach Figure 4 shows that students prefer to digest specific forms and dosage.

The next topic was to evaluate the JupyterHub platform, list arguments for and against it. Overall, these types of interfaces are seen as a good option. However, one of the interviewees did not choose the mentioned platform because, "Many free and maintenance-free programming-oriented document editors are available, such as Colaboratory". Disadvantages were mentioned such as, "Using the platform deprives students from real IDE experience" or "It lacks some core features such as code completion". The harm the former statement outlines can be overcome by teaching the students to use IDEs and Jupyter in parallel and draw attention to the differences of the environments. The lack of auto completion was considered by the respondents as useful during the early stages of programming, but uncomfortable while dealing with advanced topics where students already have the necessary skillset to write code.

5 Conclusion

IT earned its place at all levels of education. The interdisciplinary usability further ensures that such skills are not going to be redundant in the near future. This field of science has its place in most industry sectors and students must be equipped with suitable skillset to be successful. We believe that programming in education has come a long way but teaching and learning processes are far less refined compared to traditional core subjects like mathematics or languages. The questionnaire pointed out that some differences between the current and older generations must be taken into account if one wants to improve and adapt the learning process. Actual students were born into rapid development of technology and a fast-paced lifestyle. As a result, they tend to cut down on learning time which may end in

superficial learning. We plan to repeat and further refine the survey and observe the operation of JupyterHub more closely.

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EXTRACTION OF MEDICAL DATA FROM ELECTRONIC MEDICAL RECORDS USING NLP ALGORITHMS

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Abstract: Development of artificial intelligence methods in medicine requires large volumes of input data available. The source of this data is electronic health records. Extraction of data from health records is accompanied by a number of difficulties, mainly associated with their being filled out in any form and doctors using various abbreviations when putting down the information. The paper describes a method of processing electronic health records which allows extracting the necessary information from them – the one needed for building work algorithms of artificial intelligence software complexes and their learning. The method was developed and tested out on electronic health records filled out in Russian. For working with medical documents filled out in other languages, it needs no special adaptation. For this, it is sufficient to change teaching data and perform complete learning of all models.

Keywords: electronic health record, artificial intelligence, patient, prediction of disease development, machine learning.

1 Introduction

To diagnose and predict the development of diseases in medicine, machine learning (ML) methods are increasingly being used as a part of artificial intelligence (AI). Using ML requires a large amount of medical data, called Big Data. This data can be obtained from prospective studies, such as 70 years long Framingham heart study (FHS). The FHS was the first longitudinally-followed large cohort to study cardiovascular disease (CVD) epidemiology in the USA, now including a multigenerational community-based cohort of Framingham population.

Such study requires a lot of time, effort and money. More and more financing of medicine is required every year for medical research, therefore the new less expensive methods to get medical data are on demand. One of them – obtain the medical data from already existing medical documents. Electronic medical records (EMRs) and/or electronic health records (EHRs) can be considered as such medical documents. Currently, a large number of EMRs and EHRs are available, on the one hand, using their content by a physician is too time consuming and costly, and on the other hand, using algorithms to extract medical data and medical facts from them make this task very promising, makes the clinical information contained therein more accessible. The medical data, such as, EMR and EHR contains sufficient information to predict medical events successfully, can be considered sufficiently complete for this purpose (Malmasi et al., 2019).

Natural language processing (NLP) is a subsection of AI that deals with the intellectual processing of everything related to human language. Currently, there are many frameworks and libraries for working with natural languages, that are aimed at solving common problems, for example, for analyzing text, such models are trained on texts taken from newspaper articles or scientific papers. And this explains the many errors and inaccuracies in the operation of NLP algorithms with medical documents, this is due in addition to medical topics and the specifics of the type of documents, as well as using the abbreviations that the physician makes when filling out medical

documents. It has often been necessary for a new NLP tool to be developed or adapted for each medical database, and even for each clinical event, when processing EMR free text. This is labor intensive, as it requires the tools to be tested on significant amounts of text already annotated by human experts.

Modern machine learning methods model the temporal sequence of structured events from a patient's clinical record using convolution and recurrent neural networks to predict future health events. There are other approaches extracting knowledge from data through data mining based on the domain ontology. Using the approach of extracting medical data in Russian is difficult because there is no necessary software and labeled medical corpora for this. To use AI methods in medicine we need «big medical data», to get it we need algorithms to extract this data from medical documents.

Re-use of medical data based on their extraction from the EHR has appeared relatively recently and has become used, especially when data is needed to train artificial intelligence algorithms. One of the problems of using this method in Russia is that all medical texts, including EHR, are written in Russian. All available solutions are only developed for English and a small amount for German, French and Chinese. An attempt to translate EHR from Russian into English would lead nowhere since in Russia a different system of clinical guidelines is used. Clinical guidelines are a document based on proven clinical experience on the prevention, diagnosis, treatment, and rehabilitation, including models of patients, actions sequence of a health worker, diagnostics schemes and treatment, complications and comorbidities, and other factors influencing treatment outcomes. There are many NLP libraries for the English language, and there are several medical corpora to work with medical documents. Even there is a scispacy – Python package containing models for processing biomedical, scientific or clinical text.

The major challenge holding back the use of artificial intelligence technologies in medicine is the difficulty of extracting data from medical records. This is particularly pressing in working with EHRs filled out in Russian. With regard to this, the research topic covered in the paper is deemed relevant.

2 Literature Review

Electronic medical records tend to contain a variety of medical information, both structured and in the form of arbitrary text. It is rarely possible to use only one method of extracting information from an electronic medical record. The rules-based method, Classification Machine Learning method, and NLP Name entity recognition (NER) are used in the Webiomed system simultaneously (Gavrilov et al., 2020).

The most common machine learning algorithms for text classification: The Naive Bayes family of algorithms, support vector machines, and deep learning.

The Naive Bayes classifier is one of the basic classification algorithms. However, very often it works as well as, or even better than, more complex algorithms. The advantage of a naive Bayesian classifier is the small amount of data required for training, parameter estimation, and classification. All model parameters can be approximated by relative frequencies from the training data set. These are estimates of the maximum likelihood of probabilities.

Support Vector Machines. A text in the section «Complaints» frequently contains «noise» that might cause inaccuracy while applying the SVM as a text classification method.

Advantages of SVM:

- works well with a large feature space;
- deals well with small data volumes;
- the algorithm maximizes the dividing band reducing like «airbag» the number of classification errors;
- a problem always has a single solution (the dividing hyperplane with certain hyperparameters of the algorithm is always one), since the algorithm is reduced to solving the problem of quadratic programming in a convex domain.

Disadvantages of SVM:

- long learning time for large data sets;
- instability to noise: outliers in the training data become reference objects that violate it and directly affect the construction of the dividing hyperplane;
- general method for constructing kernels and straightening spaces that are most suitable for a specific problem in the case of the linear inseparability of classes are not described. Selecting useful data transformations is an art.

Hybrid Systems. This approach combines all or most of the principles discussed above and consists of applying classifiers based on them in a certain sequence.

To work with text data, unlike rule-based methods, words have to be converted into a vector representation. Unfortunately, there are no universal recommendations for choosing a particular method and a word vectorization method for particular information. Therefore, it has to be checked which vectorization method and which classification method gives the best result in each particular case.

It is difficult to perform a medical text, ignoring features of the language structure, which analyses the proposals, i.e. the essential or identifying relationships between objects of sentences or syntactic analysis of the sentence structure. For these tasks, numerous methods and ready-made software tools for the English language have been developed. There are fewer ready-made solutions for Russian, and many of them are commercial.

Obtaining EHR-derived datasets for COVID-19 used in others research, one of them this work (Pedrera-Jiménez et al., 2021). It showed effective reuse of EHRs in a tertiary Hospital during COVID-19 pandemic. Extracting household patient EHR data proved to be as effective at tracking transmission as COVID-19 contact tracing, according to research (Metlay et al., 2021). Additionally, analytic methods do not always give real-time results, it is easy to overlook or underuse EHR data. Overall, EHR data could support COVID-19 control efforts, so as long as infrastructure and methods are in place to put this to scale.

EHR data extraction errors can be explained by the following problems:

- numerous spelling errors in EHR,
- abbreviations, specific for this medical institution,
- inconsistent sentences, not in accordance with language rules.

The results of automatic text extraction can be improved by using automatic spelling correction methods, improving dictionaries (for dictionary-based methods), and training sampling (for machine learning methods) (Meystre et al., 2008).

Instead of relying on the manually created method based on rules, text classification with the help of machine learning solves the problem of classification based on the marked up training data set. Using pre-marked examples as training and validation data, the machine learning algorithm can identify associations between text excerpts and a particular opinion (diagnosis) expected for the particular input (e.g., the text of complaints). To apply this classifier, machine learning features have to be extracted: the method is used for transforming each text into digital representation in the form of a vector.

Classification results can be improved with the use of boosting technology. Boosting is a procedure for sequentially constructing a composition of machine learning algorithms when each next algorithm seeks to compensate for the shortcomings of the composition of all previous algorithms. Boosting is an optimization algorithm for constructing a composition of algorithms. Initially, the concept of boosting arose in works on probably correct training dealing with the question whether it is possible to obtain a good algorithm from the number of poor (slightly different from random) ones (Mayr et al., 2014).

For the past 10 years, boosting has remained one of the most popular machine learning methods, along with neural networks and reference vector machines. The main reasons are simplicity, versatility, flexibility (the ability to build various modifications), and most importantly, high generalizing ability.

Boosting over Decision Tree is considered one of the most effective methods in terms of classification. In many experiments, there was an almost unlimited decrease in frequency errors on an independent test sample as the composition grows. Moreover, quality on the test sample often continued to improve even after achieving error-free recognition of the entire training samples. This upended long-held perceptions of the fact that to increase generalizing ability, it is necessary to limit the complexity of algorithms.

Of interest is an open-source natural language processing (NLP) package SpaCy. It is written in Python that performs tokenization, Part-of-Speech (PoS) tagging, and dependency parsing. It is the fastest NLP parser available and offers state-of-the-art accuracy. It is presented on the site «Training SpaCy's Statistical models» at <https://spacy.io/usage/training>.

The most recent extensive evaluation of existing dependency parsers has been performed by. They evaluate 10 different off-the-shelf parsers for accuracy and speed; reporting labeled attachment scores (LAS) of 85% to 90%. While SpaCy does not perform the most accurate in their evaluation, it shows to be fastest maintaining comparable accuracy.

SpaCy models are statistical, and every decision they make, which part of speech tag to assign or whether a word is a named entity is a prediction. This prediction is based on model training examples. To train a model first training data, the special text, and placemarks, the model has to predict, are needed. This can be a part-of-speech tag, a named entity, or any other information. This package also used in Healthcare NER Models (Amogh et al., 2020).

SpaCy does not offer a pre-trained model for the Russian language, but provides an opportunity to conduct a Russian model training. SpaCy 2.0 offers new neural models for tagging, parsing, and entity recognition (Honnibal & Johnson, 2015).

3 Materials and Methods

The objective of this work is to develop a solution which allows extracting specific data from electronic health records using artificial intelligence technologies.

The tasks completed in the course of the research consisted in the following:

- to study the nature of data contained in EHRs;
- to identify data sets required for building prognostic models of the course of diseases;
- to select methods which are the most suitable for structuring and extracting data from EHRs, taking into account the objective of information search and convenience of its subsequent use;
- to develop and verify the prediction model finding out relationships between data extracted from health records and predicting the development of medical events on this basis.

When completing the tasks and achieving the set objective, the following methods were used:

- information search through sources of scientific technical information and medical information ones on the research topic;
- analysis of the collected material with its subsequent systemization;
- the comparison method which has allowed finding the most suitable ways of solving the problem under study in line with the set objective.

The research was conducted with anonymized medical data of patients from three hospitals in Russia. The authors used data on the condition of patients aged 18 to 70 having cardiovascular diseases; the data was collected by their physicians in charge during the patients' first in-office visit to the health facility. Medical records were made by different attending physicians in a free form and represented non-structured text.

As medical data to be analyzed, the following information about patients was extracted: gender, age, height, weight, arterial blood pressure (systolic and diastolic), respiratory rate, heart rate, Covid-19 symptoms, information on bad habits (smoking, alcohol abuse), the list of previous diagnoses (according to ICD-10), patient complaints, results of examination by the physician, and presence of cardiovascular diseases in parents. Recommendations outlined by doctors and indicated medical therapy were taken into account, too.

Medical records made in EHRs in the Russian language were used. Table 1 shows an example of such entries.

Table 1 Example Medical Records in Russian EHR (Originally in Russian Language)

General information: woman, 48 y.o.
Diagnosis List (ICD-10): F20.0, K02.1, I10, M42.1, N95.1, D10.4, D27
Objective: Overall condition satisfactory, emotionally labile. The skin is clean, normal color. Peripherals don't work. The throat is pink and clean. Cor tones are rhythmic. Blood pressure 130/80 mm Hg A pulse of 65 beats per minute. In the lungs, respiration is vesicular. Percussion pulmonary sound. The abdomen is soft b/b on palpation. Liver, spleen not taken away. T-36,5., Physiological functions are normal. The pasty stop. Smoking for 15 years.

Source: compiled by the authors

This data was downloaded as a text file from the clinical decision support system (CDSS) Webiomed that containing more than 50 million records (Gavrilov et al., 2020).

4 Results and Discussion

For an artificial intelligence model to start making accurate forecasts, one has to train it promptly. Training requires a large number of data samples mined from EHRs. This circumstance demanded solving a problem associated with studying the nature of data contained in EHRs.

It was found that the principal problem for artificial intelligence to overcome when extracting data from EHRs in the automated mode is the following: medical workers' using their own word abbreviations and brief note forms; spelling errors in the text; inconsistent summary of the results of examination and patient's complaints; building descriptive sentences with violation of the conventional grammar rules; and careless attitude to filling out all fields of the electronic record.

At the next stage of work, the authors selected methods which fitted best for structuring and extracting data from EHRs, taking into account the objective of information search and convenience of their subsequent use.

It has been found that at this stage of working with information, several methods have to be used simultaneously, because none of the existing methods can completely satisfy current needs in handling the data of EHRs which contain both structured information and free text. Detailed information and methods for extracting it are shown in Table 2. The rules-based method, Classification Machine Learning method, and NLP Name entity recognition (NER) are used in the Webiomed system simultaneously.

Table 2 NLP Methods in HER

Categories	Text data	Sections	NLP	Examples of Data
Presenting Problem	Structure or semi-structure (pre-defined sections)	Detailed description of problem(s)	NER Rules-based Hybrid	Up-to-day of important health problems, including diagnoses, symptoms, physical findings and physical test findings
		List of symptoms	Text classification	«chest pain» identifies portions of clinical note text where 1 of the terms describing PAIN (eg, pressure) either precedes or follows 1 of the terms describing the LOCATION (eg, chest).
		Mental status	NER	
Clinical Notes	Unstructured	Progress notes		
		Consultation letters	NER, Rules-based	
		Hospitals additional notes		
		Previous treatment history	NER	
Personal History	Structure or semi-structure (pre-defined sections)	Developmental milestone	NLP: Diagnoses extraction	
		Medical history		Past medical, surgery, developmental & social history
		Physical, emotional, sexual abuse		
		Diet, exercise		
Substance Abuse History	Unstructured	Pattern of use: onset, frequency, quantities		
		Drugs/habits of choice: alcohol, smoking	NLP: Extract information	ML methods
Family History	Unstructured	Age and health of parents, siblings	NLP: data extraction	Medical history of the family members
		Description of relation		Rules-based methods
		Cultural and ethnic influence		
		History of illness, mental illness		
Employment and Education	Unstructured	Educational history		
		Employment history		
		Achievements, patterns and problem		
Labs Tests	Structure or semi-structure (pre-defined)	Interpretations of laboratory, radiology, pathology	NLP NER	Labs test data

Other	sections)	and other	NLP Annotation
	Imaging data	Echocardiology & electrocardiology	
		CT scans	
	Scanned documents	MRI scans	
Medical documents from external sources			

Source: compiled by the authors

The use of machine learning system based on rules requires special markup of the text. The excerpts singled out during the markup are used by artificial intelligence for finding relationships between them, in particular, between snippets identified in the text of patient complaints, results of tests, examination, and the subsequent confirmed diagnosis. The use of this method requires transformation of each text record symbol into numeric representation in the vector form which is accessible for the computer software complex to process.

We used the method «bag of words», where the vector represents the frequency of a word in a predefined dictionary of words. The machine-learning algorithm then receives training data consisting of pairs of feature sets (vectors for each text example) and tags (diagnosis) to create a classification model. The common question for training data: how much data will be enough? There's still no «Golden Rule». It depends on the type of machine learning problem we are going to solve. In our case, we came to the following rule: 100 sentences of using one feature for training and 30 sentences for validation.

When developing the software for classifying the information listed in the Complaints section of the EHR, we used the following network architecture:

- input layer;
- convolution layer;
- max-pooling layer;
- fully connected hidden layer;
- output layer.

Additional layers will be added between the main layers to protect against network retraining (dropout). The principle of their operation is that the network «forgets» a certain percentage of weights (passed as a parameter in dropout). As activation in the convolution layer and the hidden layer will use the rectified linear activation function «Relu». For the output layer selected activation function «Softmax» is one of the special cases of the sigmoid function applied for multi-class classification. To implement this task the following software was selected:

- Python programming language containing a variety of libraries for dealing with data and neural networks;
- Keras part of the Tensorflow now enabling CNN, LSTM & biLSTM implementation.

Until now, a technology based on rules and regular expressions was mainly used to extract words from texts. But even now, this method is the most effective for extracting features that can take a small number of values and practically do not change over time.

This method is used in the Webiomed system to extract COVID-19 symptoms from patient's medical records. The examples are given in Table 3.

Table 3 Examples of COVID-19 Symptoms

<p>«The condition is extremely serious. Consciousness is a deep stupor. The situation is forced. The physique is correct. The normothermic Constitution»</p> <p>«Complaints (according to the mother): weakness, low mood, lack of mobility, decreased appetite: «very thin», stupors state: «sits and looks at one point, does not sleep at night» The patient herself confirms these symptoms and</p>

<p>indicates that she has suicidal thoughts»</p> <p>«The numbness of 2-5 fingers of the left hand is constant, burning in them. Vertigo is not permanent. Anosmia for more than 20 years»</p> <p>«Pain in the eyes when turning to the side. Noise in the ears. When asking questions, the sense of smell decreases»</p>
--

Source: compiled by the authors

Classification results can be improved with the use of boosting technology, the essence of which was discussed above.

When extracting data from electronic medical records, we used an open-source natural language processing (NLP) package SpaCy. The advantages of using package SpaCy were discussed earlier.

The spacy pre-train command enables using transfer learning to initialize your models with information from raw data, using a language model objective similar to the one used in Google's BERT system, State-of-the-art techniques (SOTA) in NLP. While training, a model has to memorize examples as well as learn to make assumptions that can be generalized to other new examples on the site «Training SpaCy's Statistical models» at <https://spacy.io/usage/training>. To test the ability of models to generalize, new test data is needed. To train a model from scratch, hundreds of examples for both training and validation are required. To update an existing model, the results with very few examples can be achieved if they're representative.

Example of data description for training from the program in Python:

```

TRAIN_DATA = [
("vesicular breathing, no wheezing, RR 18 in min, heart tones clear, rhythmic, BP 130/80 mm Hg heart rate 72 beats per min.",
{'entities': [(34, 46, 'RR'), (79, 97, 'BP'), (98, 113, 'HR')]}),
.... ]
    
```

Example of data description for training from the command line interface (CLI):

```

"id": 9, "paragraphs": [
{"raw": "BP 120/70 mm Hg",
"sentences": [{
"tokens": [{"id": 0,
"orth": "BP",
"ner": "B-BP"},
{"id": 1,
"orth": "120/70",
"ner": "I-BP"},
{"id": 2,
"orth": "mm",
"ner": "I-BP"},
{"id": 3,
"orth": "pr.ct",
"ner": "L-BP"},
{"id": 4,
"orth": ".",
"ner": "O"}],
    
```

"brackets": [[]],

"cats": [[]]

Text classification is one of the main tasks of NLP and allows solving problems related to the text belonging to a particular class. We applied this method to determine the main diagnosis of an EHR based on labeled medical data. Features in section «Complaints» will be used as the dependent variable, and «Diagnosis» as the target.

Major problems of the traditional method of the text classification:

1. It is necessary to choose a method for converting text to a vector representation since the best classification quality is frequently shown for various tasks various methods.
2. The resulting feature space will have a high dimension, and so it will be highly discharged.
3. Frequently stop words have to be removed from the text to improve the classification quality.
4. To apply this method, it is necessary to use stamping or lemmatization, since the words with different declensions have the same meaning.

While doing pre-processing with the text in feature «complaints» the lemmatization Python library PyMorphy2 is used. There are many algorithms for automatic text classification, which can be grouped into three different types: rule-based, Machine Learning based, and hybrid.

Metrics and Evaluation

To choose a proper method for text classification and other NLP tasks as metrics we applied:

- accuracy: the percentage of texts that were predicted with the correct tag.
- precision: the percentage of examples the classifier obtained from the total number of examples predicted for a given tag.
- recall: the percentage of examples the classifier predicted for a given tag out of the total number of examples it should have predicted for that given tag.
- F1 Score: the harmonic means of precision and recall (Chip, 2019).

An important problem with text processing for feature extraction is a large number of errors and misprints. The electronic medical records are an official medical document signed by a physician; therefore, any corrections and adjustments can't be made. In this case, preprocessing of the input text, correcting errors, misprints and abbreviations have to be done.

SpaCy provides way to increase the accuracy of the new, created from scratch model. The models take a long time to train, so not enough experiments can be run to figure out the best hyper parameters for the model training. The following algorithms for optimization we came up:

- initialize with batch size 1, and compound to a maximum determined by the data size and problem type;
- use Adam solver with a fixed learning rate;
- use averaged parameters;
- use L2 regularization;
- clip gradients by L2 norm to 1;
- on small data sizes, start at a high dropout rate, with linear decay. This was developed experimentally.

To extract various features from the EHRs, an ensemble of 4 models was developed. The results of all models are shown in Table 4, where an indication of the purpose, extracted features, used methods for extraction, data sets for training, the corresponding metrics are specified for each model.

Table 4 Developed NLP Models for Extracting Features from Medical Records

Model name	Purpose of the model	Features	Method ML	Datasets	Metrics
Objective Data	Model for extracting features of objective patient data from medical records	height, weight, respiratory rate, respiratory rate, BP	NER	More than 500 annotated texts	Precision=97.6% Recall=99.5% F1=98.6%
Smo-king Extract	Model for extracting the sign of «Smoking» from medical records texts	smoking, non-smoking	CAR, TF-IDF, LSA	More than 500 annotated texts	Precision=88.5% Recall = 96.1% F1 = 92.3%
Labo-ratory data	Model for extracting features from laboratory analysis texts	glucose, cholesterol, creatinine, urea, glycemic profile, hematocrit, triglycerides, HDL, LDL	NER	More than 700 annotated texts	Precision=91.4% Recall=87.2% F1 = 89.2%
Covid-19-Symptoms	COVID-19 symptoms extraction model	body temperature, cough, shortness of breath, chest congestion, myalgia, confusion, headaches, hemoptysis, diarrhea, anosmia, conjunctivi-tis, stupor	NER	More than 1500 annotated texts	Precision=83.6% Recall = 80.6% F1 = 82.1 %

Source: compiled by the authors

For example, the model «Objective Data» was trained in more than 500 annotated texts, using the NLP Name entity recognition (NER) method, for 120 epochs, using Stochastic gradient descent (SGD) optimizer and binary cross entropy as the loss function. The loss function results were also weighted according to the proportion of samples with positive and negative samples.

There are two methods available to obtain the models: the program on Python and the command line methods. The program method significantly loses in training time, since it uses an interpreter, while the command line method uses the program on C using the GPU.

The models were applied by the Spacy train command-line method. The «Scorer» and «nlp.evaluate» now report the text classification scores, calculated as the F-score on a positive label for binary exclusive tasks, the macro-averaged F-score for all exclusive features. Most tokens in real-world medical documents are not a part of entity names as normally defined, so the baseline precision, recall, and F1 is extremely high, typically >90%; so, the entity precision, recall, and F1 values are reasonably good.

5 Conclusion

The result of this work, extracting features from EHR, was the creation of an industrial system, which is built into the Clinical Decision Support System (CDSS) Webiomed (<https://webiomed.ai>). Features were extracted from over 600,000 electronic health records and more than 45 million features were extracted just for one month. Thanks to this work, it became possible to create datasets to create predictive models on medical data not from available datasets from other countries, but train on data from the population where the model will be used – in Russia. This made it possible to significantly improve the prediction accuracy. On Dataset – 3521 patients with 24 features, a model for predicting hospitalization in 12 months of patients with cardiovascular diseases from 18 to 70 years old was trained using this method.

The results obtained on the test data show good accuracy = 83 % and AUC = 0.89. The accuracy is captured in two metrics: the «False Alarm Rate» (the fraction of false positives out of the negatives) and the «Detection Rate» (the fraction of true positives out of the positives). For a binary classification system,

the evaluation of the performance using these two metrics is typically illustrated with the Receiver Operating Characteristic (ROC) curve, which plots the Detection Rate versus the False Alarm Rate at various threshold settings. Using the proposed method for extracting structured and unstructured data from medical documents in Russian, they will allow creating datasets for machine learning models that will be responsible for medical tasks and, most importantly, allow creating medical data of the local population with more accuracy.

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Primary Paper Section: I**Secondary Paper Section: IN, FS**

COMPANIES USAGE OF AI IN THE CZECH REPUBLIC

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Abstract: AI provides the concept of machine learning that helps to automate the decision-making process by analyzing data inputs. This paper is focused on the usage of AI mechanisms in the Czech Republic across business segments. The data from the Czech statistical office provided from 6 794 companies on the usage of mechanism as text mining, speech recognition and generation, image recognition, and machine learning robotic process automatization. The most used mechanism is image recognition, which used all of the sectors and the least are speech generation and machine learning.

Keywords: Artificial intelligence (AI), data mining, machine learning, image recognition, speech recognition, speech generation, RPA

1 Introduction

Artificial intelligence (AI) agents driven by machine learning algorithms are rapidly transforming the business world, generating heightened interest from researchers [1]. Due to the fast development of AI, we can see an increase in researchers trying to understand the latest trends and developers trying to develop major updates and advance its possibilities. Any technology opens enormous opportunities for individuals as well as societies [2]. This undoubtedly will contribute to the welfare of individuals and the growth of society [3]. Since any technology is the creation of human intellect, it may also carry issues of sociocultural and environmental concerns, such as issues of acceptability, access, and equity [4]. AI is no exception to this [5]. Nováková and Kučera [6] saw, that artificial intelligence can be used in a variety of business sectors. Artificial intelligence (AI) in the context of customer service, we define as a technology-enabled system for evaluating real-time service scenarios using data collected from digital and/or physical sources in order to provide personalized recommendations, alternatives, and solutions to customers' enquiries or problems, even very complex ones [7]. The AI can be the future of our lives. In today's world AI can be helpful in a variety of tasks, from mundane tasks we have to conquer every day to data-driving analysis and much more [8]. Through all the advancement of AI-based solutions, it can solve societal issues effectively [9]. One of the used methods done by AI can be text mining [10]. Text-mining, one of the most popular Artificial Intelligence (AI)-based data analytics approaches for extracting information from social media is exploited [11]. With social media being used every day, it is one of the most effective text sources. After text mining, another highly used feature of Ai is speech recognition and generation. An Automatic Speech Recognition (ASR) module transcribes the speech signal into a textual representation from which a Natural Language Understanding (NLU) module extracts semantic information [12]. The speech generation but lack of the human "touch" it only follows the basic of human responses. Task-oriented dialogue system (TOD) is one kind of application of artificial intelligence (AI). The response generation module is a key component of TOD for replying to user's questions and concerns in sequential natural words [13]. Another notable feature used in our daily lives by companies is image recognition. With the development of digital image processing technology and the updating of computer electronic products, digital image processing technology has been applied to various fields and has made great contributions to the progress of science and technology and the development of productivity [14]. Other interesting features are machine or deep learning for the needs of

data analysis. It trains machines by providing it sample data and thus makes the system intelligent that is helpful for real-world AI applications. Machine learning algorithms are applied to such social feedback data to excerpt useful information that confers a competitive edge to several enterprises [15]. Robotic process automation with elements of artificial intelligence (so -called intelligent RPA), in recent years, Robotic Process Automation (RPA) has been widely adopted across the industry as an important enabler for business process automation and digital transformation [16].

2 Literature research

The stochastic nature of artificial intelligence (AI) models introduces risk to business applications that use AI models without careful consideration [17]. Findings It is found that social entrepreneurship will use the opportunities of Industry 4.0 for optimization of its activities until 2030, but will refuse full automatization, using human intellect and AI at the same time.

2.1 Mining from text (advanced text analysis)

The data mining from text became one of the most key features to analyze responses from customers, based on their messages. Recognizing the importance of these applications and the role of challenge evaluations to drive progress in text mining [18]. These data can be gathered even from scanning articles on the internet any many more. Artificial Intelligence (AI) is not a general method but an umbrella that includes many digital tools that are changing the library environment. Chatbots, document classification, personalized services, text, and data mining (TDM), intelligent education, and user discovery are some of the AI tools that offer new and broad possibilities for research, access, and use of vast amounts of data [19]. This corresponds with say from Chatterjee et al. [20]. Specifically, it has been identified that different approaches are needed to tackle various types of customer data so that those may be made fit and actionable for appropriate utilization of AI algorithms to facilitate business success of an organization [20]. Since AI is still evolving so the text mining options. Advances in the availability and sophistication of software to facilitate the analysis of secondary data have contributed towards the growth of textual analysis [21]. But the Ai still lack some human reliability depending on which texts are important and which are not. Commonsense knowledge acquisition is one of the fundamental issues in realizing human-level AI. However, commonsense knowledge is difficult to obtain because it is a human consensus and rarely explicitly appears in texts or other data [22].

2.2 Speech recognition and speech generation

Automatic speech recognition often refers to converting human speech or voice to textual information with the help of artificial intelligence algorithms. With the advancement of Artificial Intelligence technologies and extensive research being conducted in AI, speech recognition has received much attention and has emerged as a subset of Natural Language Processing where the advancement and accuracy in speech recognition will open many ways to provide a high standard of human-computer interaction. Existing systems that employ Automatic Speech Recognition (ASR) technology to retrieve information from the BIM model fail to provide remote interaction, retrieve a wide range of data, and automate the entire process [23]. As we discovered earlier, AI lacks human abilities. In this example, it can be emotions and it corresponds with the research done by Amaz Uddin et al. [24]. Human speech indirectly represents the mental state or emotion of others.

The use of Artificial Intelligence (AI)-based techniques may bring revolution in this modern era by recognizing emotion from speech [25]. This corresponds with the research from Firdaus et al. [25]. Previously, research on either emotion or sentiment-

controlled dialogue generation has shown great promise in developing next-generation conversational agents, but the simultaneous effect of both is still unexplored [26]. Speech recognition can be used in business and also for educational purposes. The model presented by Zhang and Cao [26] combines voice recognition and text-to-speech technology to create functional modules of an English teaching system that change the traditional teaching mode and adjust teaching strategies in real time based on student status based on feature recognition [26]. Another important thing about speech generation is that the AI cannot consider the previous communication with the customer. However, existing works ignore the fact that not each turn of dialogue history contributes to the dialogue response generation and give little consideration to the different weights of utterances in a dialogue history. In this article, we propose a hierarchical memory network mechanism with two steps to filter out unnecessary information of dialogue history [27]. As modern AI-powered systems are cooperating with human users by not only providing raw reports but also producing information based on text generation algorithms and text-to-speech functions, it is essential to ensure that this sensitive, security-related information is not biased [28].

2.3 Image recognition

With the development of artificial intelligence (AI), the use of intelligent identification technology, invoice information for digital image recognition, extraction of information and recording in the financial accounting system, will greatly improve the efficiency of accounting workflow and information accuracy [29]. The help of image recognition can make many processes easier. The feature extraction and recognition part of the software robot image recognition function is arranged in the edge server so that the judgment and recognition can be quickly realized and the system operation efficiency can be improved [30]. Image recognition can be used in for example retail about a customer. Image recognition and other techniques are used by AI to offer more relevant data to business entities regarding customer behaviour and purchase intention [31]. Other than basic image recognition in retail or marketing it can be used for detection of position. By transplanting the artificial intelligence (AI) based image classification algorithm into the embedded platform, this method uses a forward neural network to analyse the position information coming from the coded optical frequency image received by a camera, and then the positioning results can be obtained [32].

2.4 Machine or deep learning for the needs of data analysis

Manually analyzing the discourse and different rhetorical structures can be a tedious and time-consuming process allowing some deceptive reviews to remain publicly available. However, coupled with artificial intelligence tools such as deep learning approaches, discourse analysis could be performed in a manner that is both efficient and timely. The proposed study used a balanced publicly available deceptive and truthful reviews dataset to design a discourse analysis-based credibility check scheme with high accuracy [33]. This corresponds to the paper from [22] in which he stated. However, the data-driven model processes substantial data, resulting in excessive processing time. The processing time includes the time spent to form a diagnosis model and the time for the model to evaluate the machinery condition with quantitative accuracy [22]. And it's followed by Yska, Bustos & Guedes [34]. It can be concluded that the potential of ML in management systems is dependent on the amount and quality of data. However, this latter comes at a high cost and therefore, careful cost-benefit analysis should be made before adopting ML in businesses. Overall, this review provided promising perspectives for applying ML within quality systems and potential leading ways for continuous improvement in safety, environment, and integrated management systems [34]. Deep learning, machine learning and their features can save companies a lot of important time. Since constructing data pairs in most engineering problems is time-consuming, data acquisition is becoming the predictive capability bottleneck of

most deep surrogate models, which also exist in a surrogate for thermal analysis and design [28]. We can see the future of the business and the internet depend on the development of AI, machine learning and other technologies. Even to this day, it can help. Due to the Internet, a vast amount of data is generated day by day; from those data to find useful insights, there is a need to identify and extract subjective information [35].

2.5 Robotic process automation with elements of artificial intelligence (so -called intelligent RPA)

The function of RPA is closer to human behaviour than AI. Robotic Process Automation (RPA) is a software solution that mimics human behaviour in the form of a 'Software ROBOT,' which is configured and programmed to perform repetitive organizational chores that humans accomplish [35]. Recent advancements suggest that the next generation RPA will require advanced human-robot collaboration capabilities for providing a more natural conversational interface and supporting more complex automation orchestration needs [16]. The tendencies and perspective directions of the development of modern digital devices of relay protection and automation (RPA) are considered. One of the promising ways to develop protection and control systems is the development of fundamentally new algorithms for recognizing emergency modes [37]. Automatization has been one of the greatest improvements in the production segment. Robotic process automation (RPA) has emerged as a lightweight paradigm for automation in business enterprises, making automation more accessible to non-techie business users. We can see the usage of RPA in corrosion simulation and monitoring. This RPA engine will change the world of routine corrosion simulation and monitoring. Also, it can be supplied to any routine engineering simulations. For this project, the well will be produced safely with close monitoring of corrosion and an alarm system. In the work of Wang et al. [38] we can see the future of RPA. Fully exploiting RPA technologies potential will empower higher education and finance, which makes a better future together. The mechanism of RPA to mimic the process of human thinking in solving financial problems was discussed [38].

3 Data a methodology

The data used for this article are from the Czech statistical office. Specifically, the data set is called 1. ICT in Czech companies - Results for the period 2021. The data were conducted in the form of a questionnaire, where companies could use an online form and then send an editable PDF file, via Dante Dante Web, or to a printed questionnaire, which has been sent to the news units into the data box or to the postal address. 8 166 companies were contacted but 6 794 companies participated in this research. The companies were divided into categories based on their number of employees and the field of activity, according to the classification of economic activities (CZ-NACE).

Which is the following:

- Processing industry - C (10–33).
- Production and distribution of energy, gas, water, heat and waste -related activities - D, E (35-39).
- Construction - F (41–43).
- Wholesale and retail; repair and maintenance of motor vehicles - G (45-47).
- Transport and Storage - H (49-53).
- Accommodation and hospitality - I (55-56).
- Information and Communication activities - J (58–63).
- Real estate activity - L (68).
- Professional, scientific and technical activities - M (69–75).
- Administrative and Support Activities - N (77–82).

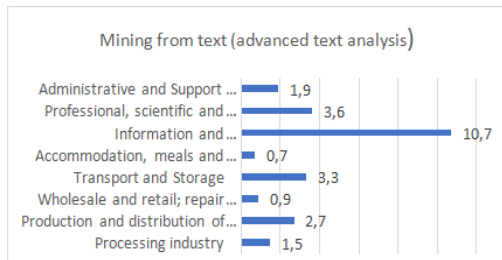
The only sectors that were excluded from this research are Agriculture - A, mining and mining - B, money and insurance - K, and sections O up to U including education, health and cultural activities.

The number used for this analysis represents share of the total number of businesses with 10 or more employees in a given size and sectoral group.

4 Results

Figure 1 represents the usage of data mining from text inputs. We can see that the Information and communication activities sector uses it the most. This corresponds with the literature findings', that data mining will be highly used in the analysis for future prognostics. Most usage of text analysis is used in professional, scientific and technical activities, transport and storage segments and production and distribution of energy, gas, water and heat and waste-related activities. None of the companies in the sector of construction and real estate activity used this technique.

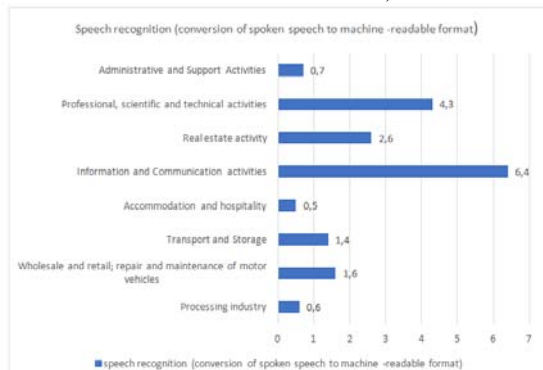
Figure1: Mining from text (advanced text analysis)



Source: Author.

Figure 2 represents the usage of speech recognition (conversion of spoken speech to machine-readable format). We can see that yet again the Information and communication activities sector uses it the most. It's followed by professional, scientific and technical activities. And the third most used sector of business is real estate activity. Most usage of text analysis is used in professional, scientific and technical activities, transport and storage segments and production and distribution of energy, gas, water and heat and waste-related activities. None of the companies in the sector of the construction and real estate activity used this technique.

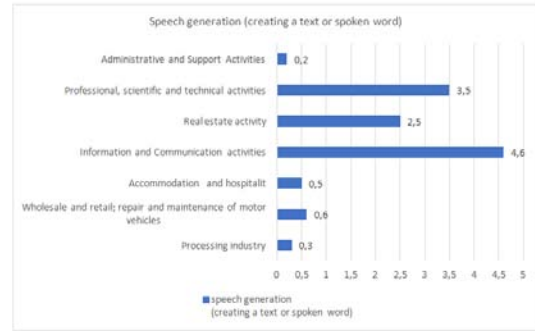
Figure 2: Speech recognition (conversion of spoken speech to machine -readable format)



Source: Author.

Another feature of the Ai in the questionnaire was speech generation which can create text or spoken words. Its results can be seen in Figure 3. The trend continues as Information and communication activities use this the most. Another large usage was in the sector of professional, scientific and technical activities, followed by real estate activities. The least amount of usage was recorded in administrative and support activities and the processing industry. Without any data was the production and distribution of energy, gas, water, heat and waste-related activities, Construction, Transport and Storage sectors.

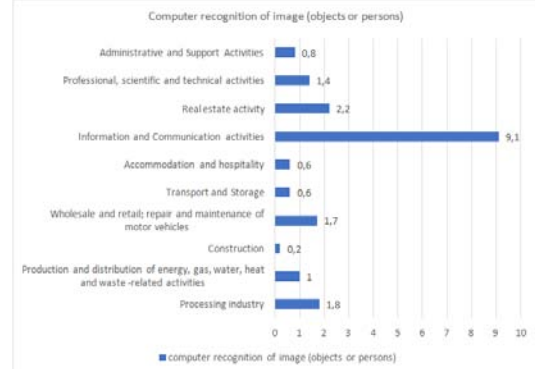
Figure 3: Speech generation (creating a text or spoken word)



Source: Author.

In Figure 4 we can see the usage of image recognition. In this case, every segment used this technique. The most are again Information and communication activities. Followed by real estate activities. The least usage was recorded construction, accommodation and hospitality and transport and storage sector.

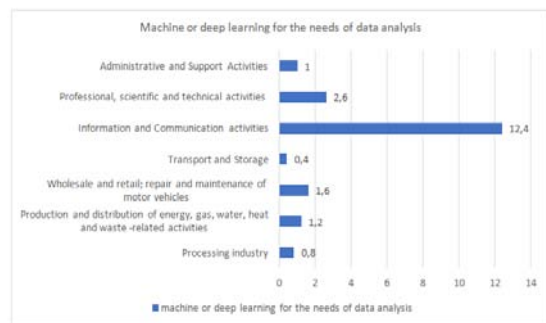
Figure 4: Computer recognition of image (objects or persons)



Source: Author.

Machine or deep learning for the needs of data analysis and its usage shows in Figure 5. The only sectors without using this feature are real estate activities, accommodation and hospitality and construction. As the results above the information and communication activities lead the chart.

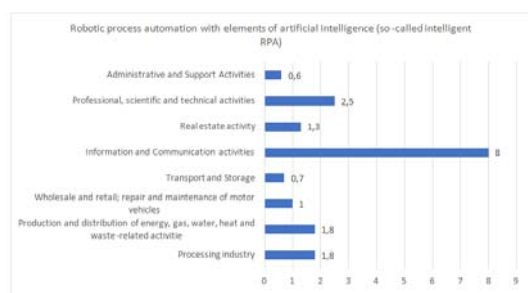
Figure 5: Machine or deep learning for the needs of data analysis



Source: Author.

The last Figure 6 represents the results of robotic process automation with elements of artificial intelligence (so-called intelligent RPA). It was highly used in information and communication activities, then professional, scientific and technical activities and the same amount of usage is represented by the production and distribution of energy, gas, water, heat and waste-related activities and the processing industry. Without any data are accommodation and hospitality and construction.

Figure 6: Robotic process automation with elements of artificial intelligence (so -called intelligent RPA)



Source: Author.

4 Discussion

The sector of administrative and support activities used every aspect of AI and machine learning in every asked technique. The most used was text mining with the value of 1,9 and the only other feature close to the value of 1 was machine learning. The least used technique for this segment was speech generation. Professional, scientific and technical activities also used all of the asked features. The most used are speech recognition and speech generation, followed by text mining. The least used technique is image recognition. Real estate activities used only 4 mechanics and those are speech recognition, speech generation, image recognition and RPA. The most used were speech generation and recognition.

The most usage of any mechanics shows information and communication activities. In all of the charts, they presented the highest results. Machine or deep learning for the needs of data analysis represents the highest value of 12,4 and the least is speech generation (creating a text or spoken word). Accommodation used text mining, speech generation and generation and image recognition. The feature with the highest value is 0,7 for text mining. Businesses in the transport and storage industry did not use only one mechanic which is speech generation. The highest used feature is text mining, and the least is the usage of machine learning for data analysis.

Wholesale and retail segment same as other 4 segments marked, they use all of the mechanics. The most used is image recognition, closely followed by deep learning for data analysis and speech recognition. The least used is speech generation. production and distribution of energy, gas, water, heat and waste – related activities used four features which are text mining, image recognition, machine learning and RPA. The most used is text mining and the least is image recognition. The last segment focused in this research is processing industry which used all of the features. The most used is image recognition and RPA and the least is speech generation.

5 Conclusion

The results show that the most used mechanics across the business portfolio is image recognition. The results show it highly used in information and communication activities, with the value of 9,1. The only segment that was over the value of 2 is real estate activities. And considerable number of segments didn't even cross the 1 value mark. This shows that the image recognition can be used in every business and provides many features that can help save time and money.

Text mining, speech recognition and the usage of RPA was used in 8 segments across the business. Apart from the information and communication activities with the value of 8 only 2 segments didn't got over the value of 1 (administrative and support activities and transport and storage activities). The fact that a large number of sectors used the mechanics for speech recognition represents the future of this mechanism. Human

speech indirectly represents the mental state or emotion of others. But it still has lack of human touch. The use of Artificial Intelligence (AI)-based techniques may bring revolution in this modern era by recognizing emotion from speech (Amaz Uddin et al., 2023).

Speech recognition and machine learning was adopted and used by 7 sectors. Speech recognition was mostly used in information and communication activities, then by professional, scientific and technical activities and closely followed by real estate activity. Only 3 sectors didn't cross the value of 1, which are administrative and support activities, accommodation and hospitality and the processing industry. The fact that deep learning for data analysis is not common, since this mechanic can help save a lot of time in the processes. Deep learning can produce excellent designs by learning from a large number of design examples (Jiang, He & Chen, 2023).

Literature:

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ARTIFICIAL INTELLIGENCE ON GUARD OF REPRODUCTIVE HEALTH

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Abstract: According to large-scale international studies, infertility affects about 186 million people around the world. The number of infertile couples increases every year. There are chances to solve this problem by implementing assisted reproductive technologies, mainly in vitro fertilization, into clinical practice. Despite high level of modern reproductive medicine development, only about a third of interventions succeed. Artificial Intelligence technologies are being integrated to make the stages of infertility diagnosis and treatment more accurate and effective. The most progressive directions of current studies are: improvement of quality of biomaterial assessment for IVF, prediction of IVF outcome based on patient data, as well as other methods. This review presents main applications of machine learning algorithms in reproductive medicine, steps involved in creating learning models, some of limitations as well as prospects for implementing these methods into clinical practice.

Keywords: artificial intelligence, machine learning, neural networks, infertility, artificial insemination.

1 Introduction

According to prior research, infertility affects about 186 million people worldwide (Inhorn & Patrizio, 2015). Main causes of infertility in women are menstrual disorders, diseases of the endocrine system, ovulatory dysfunction, damaged fallopian tubes, etc. Main factors of male infertility are abnormal spermatogenesis, genetic factors and vascular diseases. It should be noted that in about 30% of cases, diagnostic measures are unsuccessful and the cause of infertility remains unknown (Masoumi et al., 2015).

Low IVF success rates are alarming in the context of the increasing number of infertile couples (Sun et al., 2019). Assisted reproductive technologies (ART), the most common of which is in vitro fertilization, came to the aid of infertile couples. Despite its high cost, complicated technique and rather low success rate (20-30%) (Wang & Sauer, 2006), in vitro fertilization remains the main method of infertility treatment. Result of IVF is influenced by many factors: age of woman, condition of uterus, quantity and quality of obtained biomaterial (oocytes), morphological features of sperm, etc. (Greil et al., 2010). Perhaps one of the main factors affecting the outcome is quality of embryo. Careful evaluation of this parameter is especially important for the fastest pregnancy-onset (VerMilyea et al., 2020). In modern laboratories, embryo evaluation is done manually, through visual assessment of embryo morphology through an optical microscope. However, this method has significant disadvantages. First of all, evaluation is subjective because it depends on the level of knowledge and experience of the specialist. Therefore, it is difficult to make it objective, even within the same clinic. Secondly, evaluation is not universal; this is often due to the fact that medical centers use different grading systems (Steptoe & Edwards, 1978). A possibility to select one embryo with the highest potential would increase the chances of successful fertilization outcome (Wang et al., 2019). In addition, it would eliminate the risk of multiple pregnancies due to transfer of several embryos into the womb (Saedi et al., 2017).

ART includes other complex stages of prevention, diagnosis and treatment as well as large amounts of digital data. Thus, reproductive technologies become a vast field for Artificial Intelligence (AI) algorithms and classical statistical methods,

which could play a key role in development of systems medicine and improvement of health care quality for infertile couples. This paper discusses basic principles of Artificial Intelligence algorithms in the context of ART, applications of AI as well as some limitations and disadvantages.

The term "Artificial Intelligence" was first introduced by John McCarthy in 1956, defining AI as the ability of machines to learn and exhibit intelligence different in its properties from human and animal intelligence (Patel et al., 2009). Artificial Intelligence explores potential relationships in large data sets using mathematical algorithms. Moreover, to increase the accuracy of the algorithms, AI is capable of obtaining new information from successful clinical cases. Therefore, AI has a potential to reduce the number of unavoidable errors in diagnosis and treatment, and to make predictions about the health of patients (Patel et al., 2009).

Machine learning is the most commonly used class of AI-based methods in medicine, which provides tools that allow a computer to improve the analysis of present events using previous (previously entered) data. The computer, facing a familiar task, uses prior knowledge to find the most successful solution (Ranjini et al., 2020). Thus, machine learning is a subset of AI that includes computer algorithms that are able to model the relationships between sets of observable variables (input data) and sets of known output data (Camacho et al., 2018).

There are some limitations and unsolved problems with the application of machine learning algorithms, related to both the technological side of the issue and the implementation of the algorithms in real-life settings. «Underfitting» and «overfitting» are among the main challenges.

«Overfitting» manifests itself in creation of overly complicated models. Creation of such models is associated with the necessity of using large data volumes. In cases of overfitting, the situation is created when the developed model describes a particular situation under study to a high degree of certainty, adapts to teaching examples, but later yields erroneous results with new data. Frequently, the overfitting problem is due to the use of incomplete information and overly complicated models where inputs are very similar to each other.

«Underfitting» is basically the opposite to «overfitting». Underfitting consists in creating overly simple models. "Underfitting" is a situation, when the algorithm cannot capture the main trend in the data, the relationship between input and output data. The reason may be the choice of an overly simple or unsuitable algorithm (Jenkins et al., 2020).

Both overfitting and underfitting of artificial intelligence indicate a mismatch between the model and the nature of data relationships. The underfitting problem is solved by making the model more complicated, the overfitting one – by simplifying the model.

Deep learning algorithms require the use of really large databases for training, which is not always possible. Otherwise, the results may be incorrect and, consequently, all of the work on the model could be useless (Krittanawong et al., 2017).

Even if an algorithm has already been created, tested and validated, researchers face another problem – the so-called "AI Chasm". The "chasm" means that there is a huge difference between the development of a robust algorithm and its implementation in the real work of clinical workflow. Since the model is initially tested on a sample of data from a particular population, there is no guarantee that it will be able to successfully deal with the samples from another population or with a different type of data (Keane & Topol, 2018).

Reproductive medicine can render its prediction, diagnosing, and treatment of diseases more accurate and effective, respectively; to achieve this, the use of software based on artificial

intelligence technologies is expedient for medical community in their daily practices. Creation of such software products requires selecting a model and machine learning method to fit into specific features of the problem in question best, as well as creating an algorithm to help timely discover and study potential associations in big data belonging to the domain of reproductive medicine. All the above confirms relevance of the topic of this study.

2 Literature Review

The main algorithms used in reproductive medicine include Decision tree, Random forest, Support vector machine (SVM), Bayesian network (BN), Convolutional neural network (CNN), Artificial neural network (ANN) etc. (Wang et al., 2019).

Decision tree. Compared to other algorithms, Decision tree is easier to understand and interpret. The disadvantage of it is the high risk of "overfitting" (situation when the model demonstrates poor performance with examples that were not involved in its training) (Wang et al., 2019).

Decision tree can be used to identify the embryo with the highest implantation potential. Carrasco B. et al. performed a study, in which 800 embryos with known implantation data were selected. The morphological and morphokinetic parameters of the embryos were evaluated retrospectively, resulting in a hierarchical model that allows to make predictions about the success of embryo implantation using the parameters listed above (Carrasco et al., 2017).

Using such algorithms as Decision tree, Support vector method, Logistic regression, Multilayered perceptron (MLP), Sahoo A. J., Kumar Y. (2014) established the relationship between some lifestyle and environmental parameters and human sperm quality in their study. They demonstrated that age, surgical interventions, alcohol consumption, smoking, and accidents are the parameters that have the strongest impact on sperm quality. In addition, the results of the study reveal that information filtering methods increase the accuracy of algorithms.

Random forest is an algorithm consisting of an ensemble of decision trees. It corrects for the risk associated with decision trees "overfitting" and provides more accurate results than an individual model. However, Random forest requires complex maintenance.

Liao S., Pan W., Dai W., Jin L., Huang G., Wang R., Hu C., Pan W., Tu H. (2020) developed a dynamic infertility assessment system based on the parameters of patients such as age, body mass index, follicle stimulating hormone level, antral follicle count, anti-Mullerian hormone level, number of oocytes, and endometrial thickness. A Random forest algorithm was used to determine the weight of each parameter. After testing and validation, an infertility assessment system was obtained that is capable, using the above parameters, to assign a patient to one of the five categories (A, B, C, D, E), simplifying the diagnostic process.

A group of researchers led by Hafiz P. (2017) made a comparison of Random forest, Recursive partitioning (RPART), Adaptive boosting, One-nearest neighbor algorithms in the context of IVF and ICSI outcome prediction using 29 variable parameters. Data from 486 patients were chosen. According to the results of the study, RF and RPART outperform the other decision-making algorithms. It was also found that a woman's age, serum estradiol level on the day of chorionic gonadotropin administration, and the number of developed embryos were the most appropriate parameters for this type of prediction.

Support vector machine. Classifiers based on this algorithm divide the data into two classes, using the construction of one or more linear boundaries - separating hyperplanes (Jakkula, 2011). Typically, this method is used in classification and regression tasks. Its disadvantage is the complexity of model training (Wang et al., 2019).

Filho E. S., Noble J. A., Poli M., Griffiths T., Emerson G., Wells D. (2012) used the SVM algorithm to create a semi-automated system for assessing embryo viability based on the morphological features of blastocysts. Images of blastocysts obtained by microscopy were segmented using image processing and analysis technologies. Parts such as zona pellucida, trophoctoderm, and inner cell mass (embryoblast) were distinguished. These data were further processed and then entered into the algorithm to assess the viability of the embryo by its morphological features. The authors are convinced that the developed system will help to avoid subjective evaluation and make the analysis of embryos more accurate.

Support vector machine can also be used to assess the quality of sperm that is used for in vitro fertilization. Mirsky S.K., Barnea I., Levi M., Greenspan H., Shaked N.T. (2017) suggested applying quantitative phase maps for automated sperm evaluation. Obtained by interferometric phase microscopy, images of spermatozoa were processed - cell structure features such as 3D morphology, contents and parameters of spermatozoa heads were extracted. Data in the form of 378 sperm images from 8 donors were used to train the SVM-based classifier. The authors point out that to obtain more correct results, it is necessary to continue searching for a suitable algorithm, as well as to use more extensive data sets for training.

Bayesian network. Multiple studies have been conducted on the Naïve Bayes classifier. This is the simplest algorithm among the many algorithms based on Bayes' theorem. The main disadvantage of BN is that the input data must be statistically independent; otherwise, there are problems with the performance of the algorithm.

Although the Bayesian classifier is a simplified classifier, it can handle complex tasks, such as predicting the probability of successful embryo implantation after IVF.

Uyar A., Bener A., Ciray H. N. (2015) conducted a retrospective survey designed to predict the outcome of embryo implantation as a result of sperm injection into the oocyte cytoplasm (ICSI). A database comprised of the information of about 2435 transplanted embryos was used to train the algorithm. As a result, they obtained a model that can predict the outcome of embryo implantation after ICSI with an accuracy of 80.4%.

In this way, the Bayesian classifier can also be used to select the best material for in vitro fertilization. In particular embryos, as demonstrated in the study of Morales D. A., Bengoetxea E., Larrañaga P., García M., Franco Y., Fresnada M., Merino M. (2008). In order to create a database, information on embryos from 63 clinical cases was selected. The variables that determine, according to the researchers, the success of implantation was highlighted: the thickness of the zona pellucida, the degree of fragmentation, multinuclearity and blastomer size. In addition, the following parameters were used: age, number of previous IVF cycles, sperm quality, cause of infertility, number of transferred embryos, whether embryo was frozen or not, and day of embryo transfer. The information was then used to train several types of Bayesian classifiers, including the Naive Bayesian classifier, which demonstrated an accuracy of 68.25%. The authors believe that this finding will not only help as a decision support system for infertility treatment, but can also serve as a training tool for young embryologists (Morales et al., 2008).

Artificial neural networks are algorithms that, to varying degrees, imitate the behavior of the human brain. Their working principle, respectively, is based on neuronal interaction. In ANN, the neuron's role is played by Artificial neural network nodes connected hierarchically. Therefore, input data for some nodes serves as output data for other nodes. In the field of assisted reproductive technologies, ANN can be used to solve problems of classification, prediction and sample selection. Some of the disadvantages include the "black box" principle (Artificial networks have limited abilities for the user to determine causal relationships between input and output data), the significant

computational load, and the tendency of these algorithms to "overfitting" (Tu, 1996).

El-Shafeiy E., El-Desouky A., El-Ghamrawy S. (2018) used the capabilities of Artificial neural networks, particularly the Multilayer perceptron, to determine sperm quality. The database included the records of 100 patients. As variables 9 lifestyle factors were chosen. The ANN's work was enhanced by another algorithm, the Sperm Whale Optimization algorithm. The result turned out to be promising: the accuracy of the analysis was 99.96%. The researchers believe that this is caused by the combined use of ANN and SWA.

Multilayer Perceptron, Support vector method, Random forest, and Decision tree were used in a study of Hassan M. et al. (2020) to predict the outcome of IVF. Data on infertility treatment of 1729 patients were used to train the algorithms. The 25 parameters that were used to assess prognosis included age, indication for IVF, method of sperm collection, endometrial wall thickness, sperm quality, number of retrieved oocytes, administration of ovulation stimulating drugs, etc. 18 parameters had numerical values and 7 had categorical values. The accuracy of the MLP method was 97.77%. The best results were using the Support vector machine (98.01% accuracy) and the Random forest method (98.83% accuracy) (Hassan et al., 2020).

Convolutional neural network successfully handles large data sets, especially data in the form of images. During their analysis, CNN acts as a mathematical operator, which, having received images and a filter as input data, produces filtered output data. In reproductive medicine, this feature of the Convolutional neural network is actively used to classify embryo images.

In the assessment of embryonic viability, Time-lapse analysis is often used. The technology involves continuous observation of the embryo's development in an Incubator environment. The device includes a microscope and a camera that takes pictures of the embryo at short intervals. The images are then edited into a film, and a specialist assesses the embryo's development using this film.

The timing of the embryo's development stages, such as the time it takes to reach the 5-cell stage, correlates with the embryo quality and viability (Khan et al., 2015).

To perform accurate time measurements, it is necessary to manually track changes in blastocyst morphology. Khan A., Gould S., Salzman M. (2016) proposed to automate the counting of blastocyst cells from time-lapse images. Information of 256 embryos as raw 148,993 frames of time-lapse technique were analysed. As a training annotation, the developed framework used only the number of cells in the image, not requiring such parameters as the shape and size of the cells and their location. As a result, a CNN-based cell counter was obtained with an accuracy of 87.36%.

Miyagi Y., Habara T., Hirata R., Hayashi N. (2020) in their study established a possibility to predict birth in patients of several age groups based on blastocyst imaging data. 5,691 blastocyst images taken 115 (or 139) hours after insemination were collected. The images were then divided into groups based on the age of the patients. A CNN-based algorithm was developed for each of the age groups. At the same time, the data was analyzed using a Conventional embryo evaluation system. As a result, Artificial Intelligence demonstrated higher total specificity and sensitivity values than the traditional evaluation system.

One of the most commonly used embryo grading scales is the Gardner scale, which can be used to classify embryos. According to Chen T. J., Zheng W. L., Liu C. H., Huang I., Lai H. H., Liu M. (2020) the development of an automated system will reduce the subjectivity of evaluation as well as the amount of time spent on this stage of IVF. A total of 171,239 microscopy images of 16,201 embryos were selected. Authors note that this is the first study of its kind to use data from an Asian population. The images were divided into three groups: 60% for CNN training,

20% for validation, and 20% for testing. The algorithm used, based on CNN, was pre-trained on the ImageNet database (a project to build and maintain a massive database of annotated images). The same data was analyzed and assigned to groups according to the Gardner scale by three experienced embryologists. When the results were compared, the algorithm demonstrated an average analysis accuracy of 75.36%.

3 Research Methodological Framework

The objective of this research is to identify machine learning algorithms which can ensure reliable prediction, diagnosing, and treatment of diseases in reproductive medicine.

The following research tasks are outlined:

- to conduct information search for the experience of using artificial intelligence in reproductive medicine;
- to highlight the most advanced machine learning methods which can ensure a higher quality of evaluation of biological material for in vitro fertilization and prediction of the outcome of artificial insemination.

To complete the set tasks and achieve the objective, the following methods were used:

- information search through sources of scientific technical information and medical information ones on the research topic;
- analysis of the collected material with its subsequent systemization;
- the properties transfer method, in particular, transferring the properties of artificial intelligence to reproductive medicine.

4 Results and Discussion

As a result of the information search conducted in relation to the experience of using artificial intelligence in reproductive medicine, it has been found that promising lines of research are the following: a higher quality of evaluation of biological material for in vitro fertilization and prediction of the outcome of artificial insemination based on the data of the married couples.

The principal focus area of modern studies in reproductive medicine is creation of software means based on artificial intelligence; they maintain high accuracy in the work of software algorithms and obtaining results to be able subsequently to ensure reliable prediction, diagnosing, and treatment of diseases. The principal problem holding back on implementation of artificial intelligence systems is the one consisting in systems showing a good result when tested on a certain sample from the data array but yielding a not quite credible result if used on data drawn from another sample, e.g., when studying people from another population. This requires accumulation large databases, building more complex and multi-purpose algorithms, which inevitably leads to the overfitting problem arising.

When studying the opportunities of using artificial intelligence in reproductive medicine, it has been found that the main machine learning methods applied in this domain are the support vector machine, random forest and decision tree algorithms, Bayesian classifiers, and artificial neural networks.

The central problem to the use of artificial intelligence is the necessity of accumulating and systemizing large data volumes. To collect these data, a vast amount of observation of diverse groups has to be conducted, their results have to be systemized, and significant primary and secondary factors have to be identified, with the effect individual factors and various combinations of them produce on the disease course registered as well. When building work algorithms for artificial intelligence, the major challenge consists in overcoming the overfitting problem which arises inevitably out of the necessity of using large data volumes. Software products must contain algorithms which can process data collected from images, digital

data obtained by medical tests, and descriptive characteristics logged during the visual inspection.

The decision tree and random forest algorithms demonstrate good results when used in reproductive medicine as classification tools and means of predicting the disease course.

Overcoming the under- and overfitting situations is the key challenge to development of artificial intelligence algorithms.

Efforts to intensify development of software using artificial intelligence in medicine are associated with rapid development of computer technologies and expansion of the sphere of their use, both leading to accumulation of increasingly larger volumes of digitized information.

Alongside clinical trials proving their success, to implement artificial intelligence technologies into medical practice, tests are required to prevent situations termed «AI Chasm».

Creation of new and improvement of current artificial intelligence models, neural network ones in particular, urges for processing increasingly larger data volumes. Quite frequently, the required data volumes turn out to be insufficient or unavailable due to the modern medicine development level and computer technologies used in it. Thus, the major prerequisites to advance of artificial intelligence methods are to increase the amount of digitized information and to expand the possibilities of sharing it among researchers studying similar problems in people of different populations.

5 Conclusion

In order to improve the quality of care for the patients, experts from the international medical community are calling for help of computer technology.

Artificial Intelligence algorithms, despite their limitations, show promising results.

Assisted reproductive technology is a vast field for the implementation of machine learning algorithms. This field of medicine has not only large databases ("Big Data") represented by electronic medical records, but also modern diagnostic and treatment methods, into which classification, prediction and clinical decision support systems based on the work of AI can be integrated.

Thus, ART is becoming not just a resource for the development of Artificial Intelligence in medicine, but also a platform for the subsequent application of algorithms in the clinical practice.

At present, the use of artificial intelligence in reproductive medicine is not yet developed sufficiently due to imperfection of software algorithms. Some factors curbing its progress are the needed large data volumes and high resource intensity of computing tools.

Analysis of the available artificial intelligence methods has shown there is no single across-the-board method to solve all problems faced by reproductive medicine. For each task, its own method has to be selected which enables one to achieve the target result at the required accuracy level. In the course of the review conducted, possibilities of various information processing methods and reproductive medicine domains where they have shown good results have been found.

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USAGE OF ARTIFICIAL INTELLIGENCE ON SOCIAL MEDIA IN EUROPE

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Abstract: Artificial Intelligence (AI) is becoming more common in our daily life. One of the biggest segments of AI is used in business. Technologies are changing at a rapid pace and in unpredictable ways. The research was done by systematic literature of the most recent (2020-2022) academic articles from the database Scopus covering the usage of AI on social media. Dividing the find articles based on chosen criteria into categories such as social media platforms used for research and general AI usage on social media. The results show that the implementation of AI will become more and more inevitable for its variety of use on social media, like chatbots, detecting harmful behaviour, data analysis and strategy making.

Keywords: Artificial intelligence, social media, online marketing

1 Introduction

Digital media has revolutionized societies and changed forever how we do business [1]. The rise of digital media and specifically social media changed marketing [2]. From a single platform that was focused on sharing content with friends, today we can find more than 100 social media platforms all over the world. With the rise of online media platforms, intensified competition has forced platforms to develop their content and even cooperate with rival platforms [3]. The development of social media in recent years was influenced by artificial intelligence (AI). AI is one of the most important developments in the 20th century in technology [4]. By evolving technology, we can evolve another segment of the world. Interest in this technology will increase as the competitive advantages of the use of Artificial Intelligence by economic entities are realized [5]. The world of business has undergone many changes. The introduction of AI in this sector started a revolution in business as we know it. From that point onward many more sectors in business started to use AI to complete mandatory tasks to help employees with their daily jobs. From basic automatizing, data collecting, emailing, analyzing data and many more AI has much more potential in the future. For example, the research from Guru et al. [6] shows the usage of AI in online marketing. In his paper he said, AI facilitates business entities in gathering customer data at the time of searching for products. Brain modelling, time series prediction, image recognition and other techniques are used by AI to offer more relevant data to business entities regarding customer behaviour and purchase intention [6].

We can find usage by insurance companies, the research states that Recent technological and digital developments have opened new avenues for customer data utilization in insurance services [5].

2 Literature research

Technology facilitated the shift from the analogue to the digital era, starting the comprehensive digital transformation while integrating computer software and technological applications with all business processes (Ljepava, 2022). Marketing is no different from this statement. Marketing today can be done on social media (Scott et al., 2020). Social media marketing requires specific skills and competencies and has given rise to new job descriptions (Peeroo, 2023). That was one of the reasons to develop AI for social media, doing the repetitive task, analyzing data in a much shorter time and making a prediction based on the data provided by social media. Artificial intelligence (AI) has been gaining significant attention in various

fields to reduce costs, increase revenue, and improve customer satisfaction (Johnson et al., 2022). Social media used by companies are mostly used for marketing (Horák and Dlouhý, 2021). For example, Tesla. The entire promotion of the brand and its various products is done through various online social media platforms like Facebook, Twitter, Instagram and YouTube. In fact, 70% of the company's sales are done online [7]. The pandemic of the COVID-19 helped companies to realize of the potential of marketing on social media since it had many sectors struggling [8]. In the COVID-19 pandemic, many developed and developing economies accounted for a negative change in unemployment, health, education, and other social issues [9].

This shows that the usage of social media as a promotion platform can work with the right strategy. To maximize engagement and return on investment, manufacturers, retailers and brands must ensure a close fit between the product type and category of influencer promoting a product within their social media posts [10]. Many platforms provide multiple advertising options to use. Many of the platforms (Instagram, Facebook, TikTok etc.) can be programmed into small shops, so customers do even have to leave the platform and visit the shop. With this quick and compelling way to capture shoppers' attention towards fashion products, the purchase decision may differ between e-shoppers and conventional shoppers [11]. Since they can stay on the same platform the probability of making the purchase is higher, thanks to the continuous communication from brands and influencers [12].

Consumers make purchasing decisions every day, taking into account their needs, preferences and beliefs which may change due to various determinants; some depending on the consumers themselves and others on the organizations acting in the market [13]. The influences are mostly hired by the company to simply show their product to their fanbase, and let social media do its tricks [14]. As influencers are also brands, research is needed to aid influencers with their own brand management strategies [15]. Sometimes even the emotion can help. Extracting sentiment from news text, social media and blogs has recently gained increasing interest in economics and finance [16].

The development of chatbots changed communication with fans on social media and potential customers. Chatbots could be virtual individuals who can successfully make conversation with any human being utilizing intuitive literary abilities [17]. AI-powered social bots can sense, think and act on social media platforms in ways similar to humans [18]. The research done by Kaiser et al. [19] focused on the determine which photos posted online play an important role in social media communication and how can that be used to predict users endorsement to brands. The analysis shows that uploading brand photos (i.e., photos containing a brand name or logo) is related to brand love, brand loyalty, and word-of-mouth (WOM) endorsement of the brand in question [19].

The tools that AI provides can be used for the early detection of harmful bots, which can cost severe image damage to companies, public figures etc. The challenge is that social bots can perform many harmful actions, such as providing wrong information to people, escalating arguments, perpetrating scams and exploiting the stock market [18]. AI can be particularly beneficial in enhancing decision-making processes for complex and ill-structured problems that lack transparency and have unclear goals [20]. This harmful behaviour can cause many effects on the people that see this message. It can cause panic, emotional damage to the person etc. Machine behaviors embed the worst of human prejudice and biases; techniques trying to exploit human weaknesses to skew elections or prompt self-harming behaviors [21].

3 Data and methodologies

A systematic literature review of the most recent papers and journal articles published in Scopus databases from 2020 to 2023 was performed. Following the keywords for this topic and considering the research questions.

Criteria 1: Articles must be related to keywords AI in social media

Criteria 2: Articles must be published between 2020-2023

Criteria 3: Articles must be in the category Business, management and accounting or Economics, econometrics and Finance

Criteria 4: Articles must be published in Europe

The research was done in 5 steps. First, I filled in the keywords "AI in social media" which gave us 1 1338 documents. Then I limited the results to years of publication from 2020-2023, which shorted the result to 967 documents. After choosing the category of the documents there were 119 documents left. Excluding all the articles published outside of Europe gave the result of 49 documents. The initial search was then followed by preliminary screening, where the irrelevant and loosely related articles were removed, by studying their abstracts. For the last step, the full studies were reviewed. The results include the 25 most relevant studies, as shown in the results section for specific social media or nonspecific studies, which can be seen in Table 1.

Table 1: AI application

Category	Area	Articles
Instagram	Influencer marketing; social media, product placement	Rutter et al. (2021); Sands et al. (2022); Yeo et al. (2022)
Facebook	Brand love; Machine learning; Monitoring	Keiser et al. (2020)
Twitter	Social Bots; Spread of Disinformation; Big data analytics; Human error; Maritime accidents	Dominguez-Péry et al. (2021); Hajli et al. (2022)
Nonspecific	Consumer behavior; strategy; research; future development; digital technology; performance marketing; world of mouth	Bailey et al. (2022); Bartosik-Purgat, Filimon (2022); Bienvenido, Barinaga & Mora-Fernandez (2021); Capatina et al. (2020); Ceci, Prencipe & Spagnoletti (2020); D' Cruz et al. (2022); Elkhwesky et al. (2022); Ghouri et al. (2022); Jacobides, Brusoni & Candelon (2021); Jonson et al. (2022); Kunz Walsh (2020); Mahr, Huh (2022); Mardse et al. (2020); Mariani, Perez-Vega & Wirtz (2022); Mrad et al. (2022); Maynard et al. (2022); Pelau et al. (2021); Salminen et al. (2022); Williams, Ferdinand & Bustard (2020)

Source: Author.

4 Results

Category 1 Instagram: The usage of AI on Instagram was focused on 4 studies, the most valuable inside was provided by Sands et al. [22] which focuses on AI influencer marketing done by humans and by AI. The conclusion of their works is that AI in this current stage of development cannot fully replace human influencers. The study by Yeo et. al [11] researched the side of making purchases through Instagram, this one of the newest functions of this platform compared to the traditional ones. They found that adding perceived quality, perceived electronic word of mouth (eWOM) and emotional value, perceived quality, can positively influence purchase decisions for fashion apparel. The last article from my finding that focused on usage of AI on Instagram was from Rutter et al. [10] researched influencers, product placement and network engagement by analyzing the relationship between the between influencers, network engagement, their efficiency and product placement. Influencers achieved higher network engagement efficiencies than celebrities; however, celebrity reach was important for engagement overall [10]

Category 2 Facebook: Since the platform is not on its rising level and more and more people are focusing on other social media platforms that generate more marketing potential, the only study I was able to find about usage of AI on this specific platform was done by Keiser et al. [19] they focused on AI finding the usage of brand in social media posts. The findings show that from almost 44 500 photos researched the AI was able find 17% of brand items. The findings also reveal that a greater intention to post brand-related photos about a brand is associated with higher levels of brand love, brand loyalty, and WOM endorsement of that brand [19].

Category 3 Twitter: Twitter and its functions especially social bots and their spreading of fake news and disinformation, AI powered social bots can sense, think and act on social media platforms in ways similar to humans [18]. The tools that AI provides can be used for early detection of harmful bots, that can cost severe image damage to companies, public figures etc. The usage of AI can stop the spread and contact the social media platform to inform of this harmful behavior. The speed of spreading tweets across the world can be helpful or harmful, the study of DCruz et al. [23] focused on emergency response. ComACom will improve decision-making to minimize human errors in maritime accidents. Social implications: The emergency response will be improved by including the voices of the wider community [23].

Category 4 Nonspecific: In this study total of 19 studies can be found. Basic functions Ghouri et al. [24] as routine decision-making in interaction with customers. This routine provides the opportunity to establish strong relationships with customers [24]. Usage of AI in data science and AI in the research field of interactive and immersive storytelling, including virtual and augmented realities [25]. The impact of law on spreading fake news on social media by Marsden et al. [21]. Artificial intelligence (AI) research and regulation seek to balance the benefits of innovation against any potential harms and disruption [26].

Influencer marketing by Peeroo [27]. They stated that the need for information and news validation is related to the sceptical opinion regarding media information, but in different ways for the determined clusters [27]. The impact of Covid-19 on using social media and doing data processing by AI by [28]. Future development by Mahr and Huh [29], Johnson, et al. [20], Ceci, Prencipe & Spagnoletti [30], Kunz and Walsh [1]. The growth of aWOM is theorized as a result of new developments in AI natural language processing tools along with autonomous distribution systems in the form of software robots and virtual assistants [31]. Also by Capatina et al. [32]. Customer behavior by et al. [13]. Strategy done by AI from Salminen et al. (2022), stated that Artificial intelligence, particularly machine learning, carries a high potential to automatically detect customers' pain points, which is a particular concern the customer expresses that the company can address [33] then by Mariani, Perez-Vega & Wirtz [34].

5 Conclusion

The study provided a systematic literature of most recent (2020-2022) academic articles from Scopus covering the usage of AI on social media, focusing on the usage of specific platforms such as Instagram, Facebook and Twitter and the general topics including the prescribed keywords. The most reviewed platform is Instagram, then Twitter and lastly Facebook. There was no finding on any other platform as Tik Tok, which is one of the most popular these days. The findings indicate that AI is predominantly used to determine the best way to sell product, communicate with customers, and make strategy for social media. Depending on what kind of relationships service providers form with the emerging technologies, they may develop new service communication strategies and new interaction possibilities with customers [29]. The research shows that the implementation of AI will become more and more inevitable since it can easily do repetitive tasks or search a lot of data in a fraction of the time compared to the regular worker.

The trend of evolving AI and its features becoming more and more accessible to small companies, proving that AI will keep evolving and become the basic software for marketing companies and influencers. The relationship between influencers and AI can be positive too. The AI can help predict consumers behavior and detect harmful chatbots, that can harm the image of a company or an individual.

However, AI is far from being independent, so in future years it will still need a human, who can detect emotions, and creativity and relate to customers on a different level than a robot.

The limitation of this study is based on the study design and search terms. Therefore, for future research, I will extend the search keywords and the field of publication. Considering the evolving AI there will be more studies to cover in the future years.

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