ADVANCED EDUCATIONAL TECHNIQUES AND THEIR ROLE IN ENHANCING LEARNING OUTCOMES

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Abstract: Against the background of active globalisation of the educational environment and the dynamics of the labour market, there is a need to formulate new requirements for students' knowledge, skills and abilities. In turn, the educational process requires the introduction of innovative pedagogical methods. The article aims to analyse the impact of modern, innovative pedagogical technologies on the quality of the educational process. The study reveals the specifics of students mastering various types of skills and competences with the help of innovative pedagogical tools. The prospects for developing specific innovative teaching methods are analysed, in particular, learning through argumentation, methods of knowledge-intensive research training, immersive projects, cross-, practical and embodied learning, pedagogical technology of subject portfolio, storytelling and gamification methods, and tutoring. It has been established that the formation of essential skills and abilities of the student requires an integrated approach based on the principle of combining individual pedagogical technologies, primarily in the context of individualisation of the educational process (personalisation of education, tutoring). Several factors that influence the process of forming a value-based approach to competitive human capital development, the basis of which is formed at the learning stage, are identified: communication and cross-cultural competence, critical thinking, digital literacy, and leadership skills. It is substantiated that modern pedagogical technologies, approaches and tools should be adapted to actively implement successful international practices against European globalisation principles of sustainable development, especially in the context of practical and knowledge-intensive research training. The specifics of innovative teaching methods' impact on the quality of education, including in the context of European countries, are investigated. The most promising effectiveness of digital platforms and mobile applications has been established. It is proved that integrating innovative pedagogical solutions into the educational environment increases students' motivation, stimulating the development of basic skills for successful social and professional realisation, competitiveness in the labour market, continuous self-development and self-improvement.

Keywords: Integration processes, teaching methods, digitalisation, innovative teaching tools, pedagogical technologies, motivation.

1 Introduction

Against the backdrop of active, innovative transformation of all areas of social life and the ever-growing volume of educational information, traditional educational approaches, methods, and tools cannot effectively implement their intended functionality. Today, mechanisms to increase students' motivation to continuously develop themselves and improve their competences are particularly relevant.

In European countries, the need to implement innovative pedagogical solutions to ensure a high level of competitiveness for future specialists was earlier realised. Therefore, the practical pedagogy experience in these countries is valuable for Ukraine. The relevance of introducing innovative teaching methods into the modern education system is intensifying given active European integration processes, which require optimal conditions for promoting students' personal and professional development.

In this context, improving the quality of education, which is formed under the influence of both pedagogical methods and students' independent updating of knowledge, is of great importance. Innovative learning solutions require specific structuring and research from the standpoint of universality for different educational process forms and levels.

2 Literature review

Several scientific developments and publications by researchers have reflected the problem of introducing innovative teaching methods in the educational programmes of the modern digitalised educational environment. In particular, Susanty et al. (2021) investigated the potential of innovative pedagogical tools in forming skills and abilities of primary importance. Scientists pay special attention to digital opportunities, namely mobile applications.

Researchers Kennedy and Sundberg (2020) placed a vital education in science, technology, engineering and mathematics (STEM) at the centre of all recommendations. In addition to a vital STEM education, the skills of today, according to the authors, should also include several specific generic skills and dispositions, including intercultural skills, collaboration, critical thinking, and problem-solving. The central issue of this study is the need for creativity and innovation. In continuation, Sinambela et al. (2020) insist on developing self-competence and supervision for modern professionals to achieve professionalism in any field.

Researchers Bratianu et al. (2020), Nurtanto et al. (2020) analyse the method of problem-based learning in Industry 4.0 in terms of intensifying the quality of education. Bratianu et al. (2020) focus on business education: knowledge transfer, competence, skills and attitudes. The research focuses on the need to change the paradigm of business education by creating a new learning environment focused on business competences and the new dynamics of the knowledge ecosystem. At the same time, Nurtanto et al. (2020) see a promising opportunity to improve the quality of learning through symbolic literacy and professional skills training.

The problem of integrating various pedagogical innovations into the traditional educational environment is paid attention to by Greene et al. (2021), Cebrián et al. (2020), Fatima et al. (2024). In particular, Greene et al. (2021) explore the issue of incidental learning, that is, learning that occurs when people pursuing a goal other than education, such as entertainment, encounter information that leads to a change in thinking or behaviour. At the same time, Cebrián et al. (2020) study the educational competences required for sustainable development. According to the researchers, the modern educational environment should create interactive, learner-centred teaching conditions, requiring transformational pedagogy, participation and collaboration, problem orientation and the principle of transdisciplinarity. At the same time, the connection between formal and non-formal learning should be implemented as a key to essential sustainability competences.

Bauman and Lucy (2021) propose an innovative foreign language teaching model using an extensive data corpus. At the same time, Pate (2020), Viunenko et al. (2023), Wang et al. (2023), Valero Haro et al. (2022) explore the possibilities of discussion methods and incidental learning, learning through argumentation. In particular, Viunenko et al. (2023) identify innovative areas of application of information and computer technologies and advantages, obstacles, and mistakes in their implementation. Among the advantages, the authors note open access, cost-effectiveness, integration of students of all forms of education, and the ability to independently solve educational and research problems. Instead, Wang et al. (2023) substantiate a promising vector for improving education technology and the scientific field: the development of research projects and digital modelling, the use of game-based learning, improving assessment, and improving feedback.

Baird and Parayitam (2019), Larionov et al. (2021) study the model of informal education, positioning it as an essential area for intensifying the quality of education in the context of adaptive and socio-cultural educational functions and the necessary skills of continuous self-education. The researchers identify several skills and competences that modern employers assess as the most important: communication skills, critical thinking skills, listening skills, professionalism (hard skills), and personal motivation.

Without negating the significance of scientists' achievements in the field, it is necessary to note their specific fragmentation, which necessitates the synergistic use of the most compelling

universal innovative teaching methods and further active scientific and methodological development of their practical implementation in the educational process.

3 Aims

The article aims to analyse the impact of modern, innovative pedagogical technologies on the quality of the educational process. Within the framework of this goal, several tasks can be identified:

- to study the specifics of mastering different types of skills and competences by students with the help of innovative pedagogical tools;
- to analyse the prospects for the development of specific innovative teaching methods;
- to identify the factors that influence the process of forming a value-based approach to the concept of competitive human capital development;
- to study the specifics of the impact of innovative teaching methods on the quality of education.

4 Materials and methods

The research methodology is based on several modern scientific methods, including the following:

- a systematic method that allows the study of the phenomenon of innovative pedagogy as a systemic formation, and the methodology of developing core competences of students as its integral subsystem, which functions based on approved theoretical views and effective practices;
- a method of retrospective analysis, which is founded on the concepts of theory and practice of innovative approaches to the educational process in the context of formation and modern development; it is based on diagnostic analysis, which allows the find specific problems or shortcomings of the proposed educational technologies, and ultimately to evaluate the successes achieved. Retrospective analysis is established on achieving goals in the future, but it is based on data from the past;
- comparative analysis, which allows the study of the specifics of the impact of pedagogical strategies and methods of different countries on the level of quality of education, taking into account practical experience and existing challenges; comparative analysis in the research was used in comparing the characteristics of two or more than two teaching methods in order to identify standard and different features, identify the innovative component, and perform typology;
- other theoretical methods: analysis, classification, systematisation, generalisation. The methods of analysis and synthesis were utilised to identify the factors and stages of development of the object under study, as well as its defining elements. Induction was used to forecast indicators of future development. The method of scientific abstraction was operated to formulate theoretical generalisations, clarify the conceptual apparatus, identify the main concepts and categories, and formulate the study's conclusions.

5 Results

The introduction of innovative teaching methods is now considered from the perspective of the need to improve the quality of education and the effective development of practical communication skills and digital and other competences by students. The active integration of a wide range of active forms of work, non-standard methods, and innovative technologies contribute to a deeper understanding of the educational material by students. The definition of "innovation" in Greek means "renewal" or "change". Innovative technologies in education are positioned as a purposeful, systematic set of techniques and means of organising learning activities, covering the entire learning process from setting goals to obtaining results. Among the innovative educational methods of our time are learning through argumentation, methods of research-intensive teaching, immersive projects, cross-fertilisation, practical and embodied learning, pedagogical technology of subject portfolios, storytelling and gamification methods, and tutoring.

In particular, the methodology of teaching through argumentation helps to master the skills of discussing diverse issues with the practical application of theoretical subject skills, which helps to improve the critical thinking of students, teaches them the methodology of differentiating arguments, persuasive communication, and helps to optimise speech and grammar skills. Listening is a necessary component of the argumentation process, contributing to developing universal valuable skills for personal and professional development. At the same time, active discussion of current issues significantly increases learning motivation (Susanty et al., 2021; Kennedy & Sundberg, 2020).

The methodology of research-intensive teaching involves acquiring knowledge, skills and abilities through developing targeted research projects or implementing research. In doing so, valuable skills are acquired in data analysis and presentation, critical thinking, communication, and collaboration. The methodology allows for an interactive approach to learning and motivates students to actively integrate into the research system (Sinambela et al., 2020; Bratianu et al., 2020).

The cross-curricular learning methodology in modern educational programmes is a comprehensive pedagogical approach that combines formal and non-formal learning elements. The methodology promotes the development of the ability to conduct a constructive discussion, stimulates students to learn to form open questions, forms an individual linguistic and communicative model of argumentation, intensifies motivation for the learning process, and greatly facilitates students' understanding of abstract concepts (Baird & Parayitam, 2019).

The methods of experiential learning and embodied learning are potentially effective. Practical learning promotes maximum interaction of students with the environment. It actively motivates them to apply the knowledge, skills, and abilities acquired in the course of study in real-life situations (Larionov, 2021).

The basis of the embodied learning methodology is the impact of physical activity on the academic and cognitive results of the educational process. At the same time, learning acquires the features of a game activity. Partner and group formats of activities improve sharing experiences and communication skills. The benefits also include the ability to communicate thoughts and feelings to others, actively developing imagination and creativity, and effective teamwork (Nurtanto et al., 2020; Greene et al., 2021).

Integrating various interactive technologies and digital methods can significantly improve learning outcomes. In particular, it is promising to use the capabilities of innovative digital educational platforms, online resources, and mobile applications. It is advisable to create a learning environment that is as close as possible to the actual conditions of activity using *immersive technologies*. The latter are identified as integrating virtual content into the physical environment, creating conditions for effective interaction. At the same time, the user recognises virtual components as an integral part. The spectrum of immersive technologies covers several applications and tools that allow for integration, immersion or interaction with simulated environments and objects (Valero Haro et al., 2022; Lucy, 2021).

The subject portfolio's pedagogical technology deserves attention. The methodology involves self-assessment of personal achievements, accumulation of knowledge, skills, and experience while studying a subject, and recording one's achievements. This methodology is most popular and influential in language learning, demonstrating the effectiveness of the learning process and a way of self-assessment of achievements.

The tutoring methodology is positioned as an individual educational practice. The tutor's competence allows for the most accurate analysis of the learner's personal choice in learning,

which helps to form a sustainable motivation for the learner in the effectiveness of the process. The methodology represents a new trend in education towards individualisation of the process (Cebrián et al., 2020; Fatima et al., 2024).

The storytelling methodology is an aspect of a didactic pedagogical resource. Elements of the methodology are introduced into the educational process to create a positive learning atmosphere and improve speech skills. Digital storytelling, in listening and reproducing a story and highlighting its elements, ensures the development of universal skills of paramount importance.

The OECD Skills Studies series, implemented by the European Education Area (2023), aims to provide a strategic approach to policy on the skills of today's graduates. It presents international OECD indicators and policy analysis covering issues such as the quality of education and curricula, including innovative learning. Figure 1 shows the dynamics of integrating innovative teaching methods into the European educational environment.

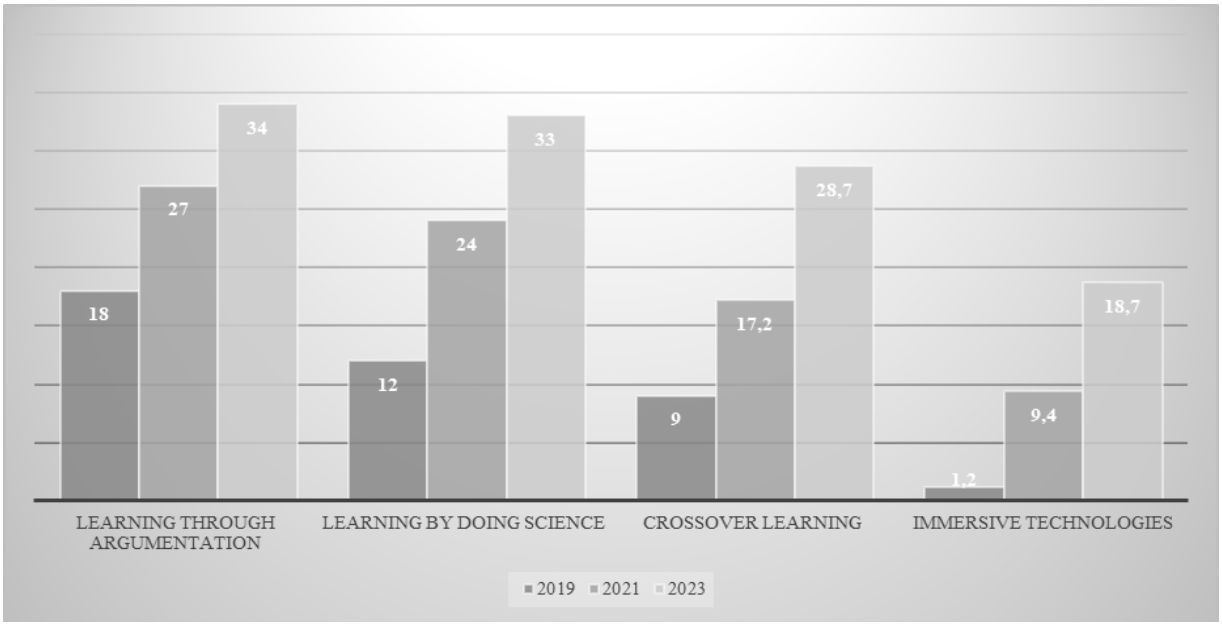

Figure 1: Integration of Innovative Teaching Methods in the European Educational Environment, % of higher education students.
Source: Systematised by the author based on (European Education Area, 2023).

As shown in Figure 1, there is a clear trend towards the active implementation of modern teaching methods. The dependence of improving the quality of education on the level of implementation of innovative pedagogical technologies is apparent (Pate, 2020; Viunenko et al., 2023; Wang et al., 2023). At the same time, the format of information education is gaining relevance. The reports of the European Community (Eurostat, 2023) in the series Participation Rate in Informal Learning by Learning Form and Educational Attainment Level provide indicators of the proportion of students in individual member states of the European community involved in the system of informal education (Figure 2).

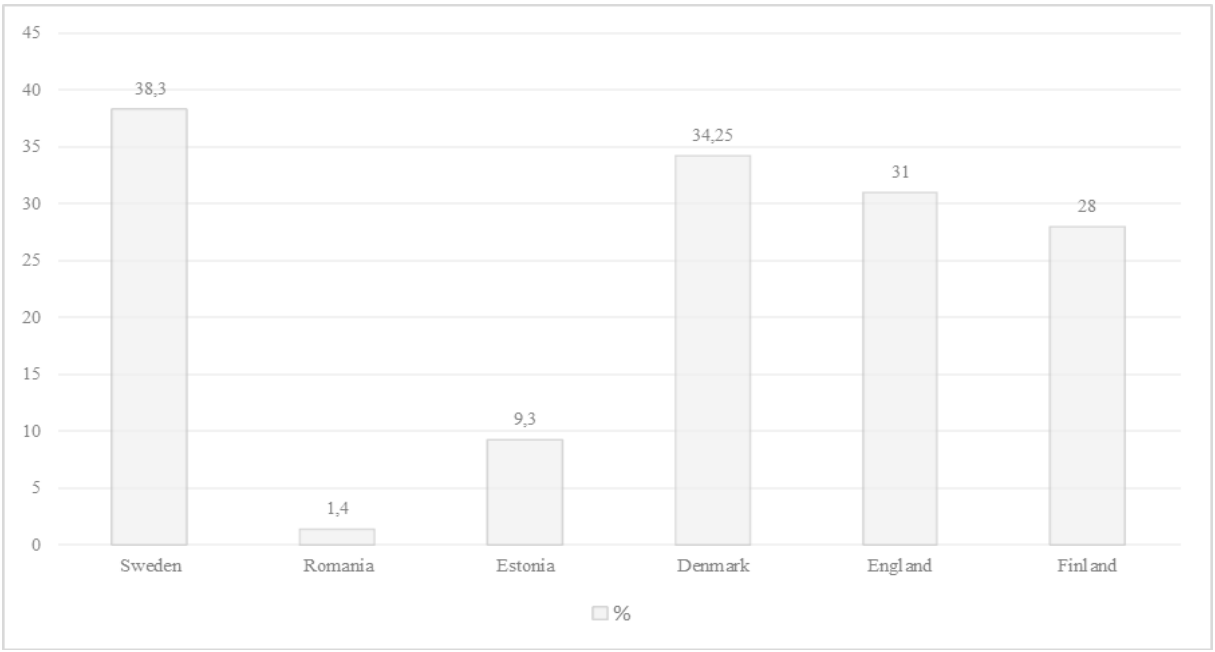

Figure 2: Involvement of European Educational Institutions in the E-learning System, % of students.
Source: Based on data from (Eurostat, 2023).

Analysing Figure 2, it can be argued that the average European value of student involvement in informal learning is about 10 %, i.e., every tenth student, and for the most developed countries in the region — every third. The strategy of informal education in internationalisation allows for the optimal development of students' life skills and healthy lifestyles and compensates for the lack of professional competence. In the process of interaction with formal and non-formal education, informal learning acquires innovative qualities.

Information education can be implemented by integrating innovative teaching methods of modular, distance, and blended learning, which promotes the development of creativity and motivates the individualisation of the educational process. In particular, the following methods of informal learning can be successfully used in the process of informal learning:

- trial-and-error method, which motivates independent search for answers to problematic issues;
- mutual learning in the process of jointly solving tasks;
- development of a system for acquiring up-to-date knowledge using innovative information technologies and artificial intelligence;
- engaging in global experience by visiting exhibitions, museums, projects, including online;
- using the potential of innovative online educational platforms, mobile applications, and chats that adapt the learning process to the concept of modern youth's worldview.

Holon IQ accumulated analytical information on integrating innovative pedagogical technologies in the European educational environment in the 2023 Europe EdTech 200 report, shown in Figure 3.

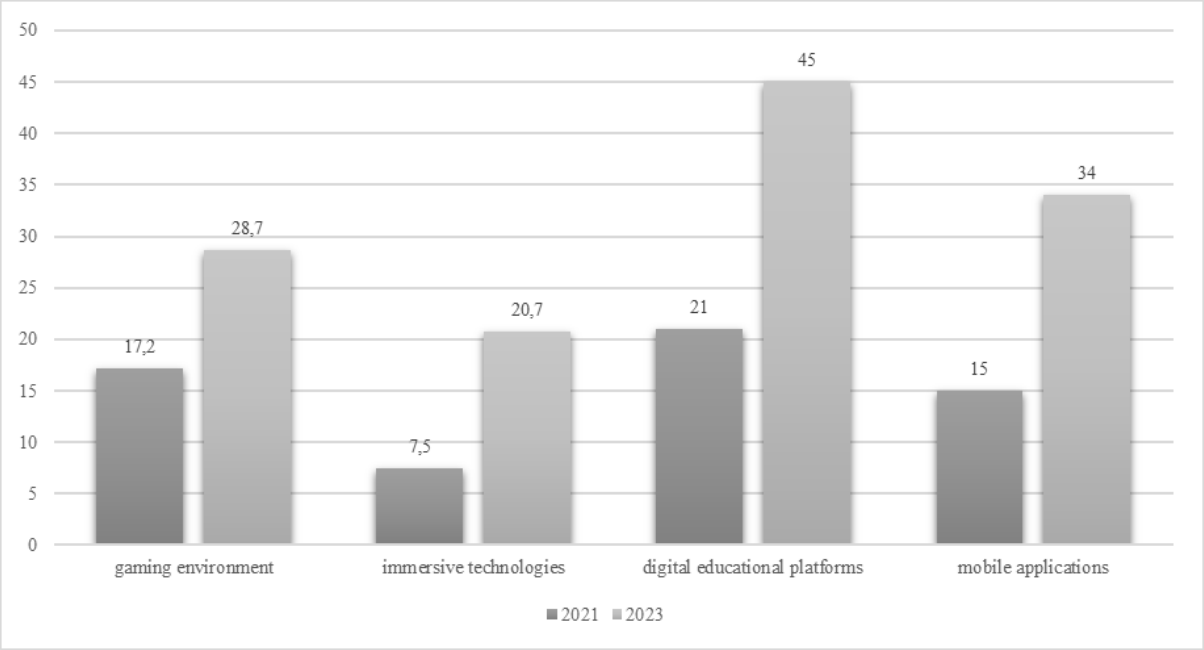

Figure 3: Innovative Learning Tools in European Higher Education Institutions, 2021-2023, % of students involved out of the total number. Source: compiled by the author based on (Holon IQ, 2023).

Given the close interconnection of formal, non-formal, and informal education systems, introducing innovative teaching methods allows for developing the student's existing and new competences. The modern trend of individualisation of learning requires participation in seminars, online events, conferences, and independent analysis of experience using the potential of social networks and information and communication technologies.

The above-mentioned innovative teaching methods in today's educational environment allow for the creation and improvement of an effective learning environment in an innovative format, significantly improving the quality of education. Modern pedagogical tools ensure a sustainable and long-term interest in learning, ensuring students develop the primary competences and practical skills necessary to ensure their competitiveness as future professionals.

Potential challenges and negative aspects must be considered. It should also be noted that the educational process's target audience and teaching staff may not be ready for large-scale changes to the traditional curriculum. Therefore, it is necessary to correctly and tolerantly integrate some aspects of innovative methods into the educational process, taking into account the needs of different groups of students based on constant monitoring.

Introducing various multimedia tools and immersive and interactive technologies in combination with traditional methods can significantly improve the effectiveness of education. The quality of education is currently determined by the need to maximise student motivation and make them aware of the value of communication competences, digital development, cross-cultural tolerance, and critical thinking. This goal can be achieved through innovative teaching methods.

Among the progressive educational technologies available for use now are genially (a resource for creating interactive multimedia educational content), class VR (exciting approaches to using augmented reality for educational purposes), and STEMlearning (a resource with guides and step-by-step instructions for implementing STEM — science, technology, engineering, and mathematics). Such tools can effectively expand and complement the educational process.

6 Discussion

According to the results of scientific research by modern scientists, in particular Lubko & Sharov (2021), Ismara et al. (2021), the integration of innovative teaching methods is a condition for ensuring the competitiveness of future specialists in the labour market and the acquisition of universal competences by students. Most modern scholars consider all teaching methods beyond the traditional education methodology innovative.

Some scientists, in particular, Sanabria (2017) and Zhu et al. (2015), focus on transforming the existing management system in higher education. According to the researchers, interactive learning technologies make it possible to effectively organise the

management of information flows and the use of digitalisation tools, improve the level of media competence of students, and minimise the resource intensity of the educational process while intensifying its effectiveness.

Scientists Aguayo & Eames (2023), Seufert et al. (2022), Papanastasiou et al. (2019) emphasise that one of the most effective means of intensifying the quality of education is the active use of modern tools of virtual reality technologies. The researchers' works reveal the need to interact with modern, innovative educational solutions in the context of machine learning, artificial intelligence and immersive technologies. According to scientists, introducing training and educational systems based on virtual reality technologies creates a strategic opportunity for their use in the educational process at various levels.

Researchers Arifin et al. (2018), Rudina & Shvanova (2018), Kozub et al. (2024) substantiate the expediency of using game technologies in education. According to scientists, their unique advantage is that they are available for use on smartphones. Unique educational platforms are seen as particularly influential within the framework of the outlined educational concept. Such innovative tools, by intensifying the motivation of students to learn, contribute to the acquisition of practical skills in the use of theoretical knowledge, including in the process of studying natural sciences. To develop this topic, scientists argue that gamification contributes to forming strategic vision and creative thinking, risk assessment skills, and independent decision-making. When used effectively, gamification promotes teamwork and optimises communication between participants in the game process. According to researchers, students improve their self-organisation and self-discipline, and the overall level of efficiency of the educational process increases because, from the beginning of participation in the game process, the participant actively tunes in to practical work (Voropayeva et al., 2022). In comparison, traditional teaching methods focus maximum attention approximately in the middle of the lesson.

Given the position of most modern researchers, the methods presented in the current article can be positioned as innovative solutions in education, as they actively involve the capabilities of information and communication technologies and contribute to the development of students' competences.

Despite the significant scientific achievements in innovative pedagogy, the issue of its large-scale practical adaptation to the traditional educational process remains unresolved, which determines the direction of further research.

7 Conclusion

The rapid development of modern digitised society requires adaptive renewal and intensive transformation of the educational system. In this context, innovative teaching methods are an essential functional tool.

Analysing learners' mastery of various skills and competences through innovative pedagogical tools shows the prospects for developing individual innovative teaching methods. Among them are the methodology of learning through argumentation, research-based learning, immersive projects, cross-cutting, practical, and embodied learning, the pedagogical technology of subject portfolios, the method of storytelling and gamification, and tutoring.

It has been established that forming the learner's primary skills and abilities requires a comprehensive approach based on combining individual pedagogical technologies.

Several factors have been identified that influence the process of forming a value-based approach to developing competitive human capital, which is shaped during the learning stage. These include communication and cross-cultural competence, critical thinking, digital literacy, and leadership skills.

Research on the specifics of the impact of innovative teaching methods on the quality of education in European countries indicates that the integration of innovative pedagogical solutions into the educational environment can enhance learners' motivation, stimulating the development of critical skills for successful social and professional realisation, competitiveness in the labour market, and continuous self-development and self-improvement.

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Primary Paper Section: A

Secondary Paper Section: AM