

STUDENT EXPERIENCES OF UNIVERSITY EDUCATION DURING THE COVID-19 PANDEMIC: EVIDENCE FROM SLOVAKIA

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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; Fosslie, 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

Secondary Paper Section: AM, AH