REMOTE LEARNING IN UNIVERSITY EDUCATION
- EXPERIENCES OF THE PARTICIPANTS IN THE DIDACTIC PROCESS

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Abstract. Education using the Internet that characterizes the current generation of remote learning, thanks to the emergence of the COVID-19 pandemic, has become a necessity at the beginning of 2020 and the subject of new, previously unknown educational experiences for all actors in the higher education process around the world. The purpose of this paper is to present the results of these experiences with particular attention to the perception of this process and its consequences - by students. The author's intention was to pay special attention to the differences in the perception of selected aspects of the analyzed form of education by students of different modes of study, which, despite the small size of the research sample, fills the gap in this thematic area. In the paper, the results of the analysis of secondary sources and primary surveys were used. The research, carried out using a face-to-face survey and CAWI, was conducted among 119 students of both full-time and part-time studies at two public universities in Rzeszow - Rzeszow University of Technology and the University of Rzeszow. Summarizing the results of the study, it was found that the perceived benefits of e-learning, which mainly include time savings, convenience of studying, less stress during classes, justify the positive attitude of most students towards the remote form of education. The balance of the aforementioned benefits as well as numerous perceived drawbacks of such a form of education implies the preference of the majority of students surveyed for hybrid education, which they expect to continue after the end of the pandemic.

Keywords: education, remote learning, higher education

Introduction

The periodization of the history of e-learning is presented in the literature in the form of three generations: correspondence (such education consisted of sending printed educational materials through the mail, supplemented over time by audio cassettes, videos, CDs and DVDs), associated with the spread of radio and television, and using modern information and communication technologies, including primarily the Internet (Górnikiewicz, 2004). Education using the Internet that characterizes the current generation of remote learning, thanks to the emergence of the COVID-19 pandemic, has become a necessity at the beginning of 2020 and the subject of new, previously unknown educational experiences for all actors in the higher education process around the world. The vast majority of them were not prepared for such changes in educational methods, tools and organization. The need for rapid implementation of remote learning was accompanied by the appearance of publications on, among other things, the effective mentioned methods and tools of such a form of education and the experiences of teachers and university authorities in this area, most often expressed in the benefits and risks of e-learning described by them (Ejdys & Kozłowska, 2021; Godewa & Kutek-Sładek, 2020; Górnicka, 2020; Olszyńska et al.,

2021; Prokopowicz, 2020; Salahshouri et al., 2022; Sulla, 2022; Li et al., 2022; *E-learning in the Time..*, 2021).

The purpose of this paper is to present the results of the experiences of those involved in the process of remote learning with particular attention to the perception of this process and its consequences – by students. The author's intention was to pay special attention to the differences in the perception of selected aspects of the analyzed form of education by students of different modes of study, which, despite the small size of the research sample, fills the gap in this thematic area. In the paper the results of the analysis of secondary sources, primary surveys and statistical methods, including the analysis of structures (proportions) of responses, tests of significance of differences between selected indicators of structure, and Pearson's $\chi2$ test were used.

The research, carried out using a face-to-face survey and CAWI, was conducted in 2021 among 119 students of both full-time and part-time studies at two public universities in Rzeszow – Rzeszow University of Technology and the University of Rzeszow.

The starting point for the presentation of the results of the empirical research is the presentation of the results of the analysis of scientific publications on the ways of defining, forms and experienced by

teachers and researchers the benefits and drawbacks of using e-learning in higher education. The following sections of the article are devoted to them.

Literature review

Distance learning – definition and forms

Definitions of the term e-learning (used in the literature interchangeably with such terms as distance learning, distance education, remote learning, electronic learning, or distance education) reflect the essence of teaching taking place in an alternative form to traditional teaching, in terms of the unity of place and time of the participants of the didactic process, carried out by classical didactic methods with observance of the applicable rules of the institutions that organize such processes (Stanisławska, 2003), i.e. – distance learning. Authors of e-learning definitions describe this phenomenon using different terms for the key tools applied in this model of education. These include, depending on the author of the definition:

– appropriate software and hardware (Sewastanowicz, 2021);

– electronic and IT media, mainly the Internet, but also other computer networks (Basińska & Garnik, 2014, pp. 77-94; Cojocariu et al., 2014, pp. 1999-2003);

– information technology (Hyla, 2016) and information systems, portals and platforms (Olszyńska et al., 2021, pp.135-152);

– ICT technologies, especially the Internet ones (Stecyk, 2006, pp. 295–300).

– Within the framework of remote learning, different specific forms of it can be distinguished. The remainder of this section of the paper highlights the most relevant objectives of the paper.

– Depending on the mode of participation in remote learning of students and teachers, four basic forms of e-learning are distinguished (Lawn et al., 2017; Littlefield, 2018; Karcewicz, 2007, pp. 147-151; Heba, 2009, pp. 145- 152; Piskorowska, 2017):

– asynchronous education (contact between teachers and students is not simultaneous; learning content is used by participants at any place and time),

– synchronous education (contact between teachers and students is simultaneous using video meetings, among other things, but from different locations),

– blended learning also referred to as complementary or blended-learning (distance learning tools are used to support traditional teaching),

– self-learning (does not require contact between participants in the didactic process).

– Taking into account the form of transmission of educational content, within the e-learning formula teaching one should distinguish (Piskorowska, 2017, pp. 24-34):

– a delivery form – this includes lectures and materials for self-study in the form of multimedia presentations, text files, audio recordings and videos made available through an educational platform;

– an interactive form – this form requires active participation and involvement of students; it includes tests, games, simulations, quizzes, among others;

– a collaborative form – it is based on the interaction of two or more people in teamwork, their discussion, working out solutions to tasks and problems.

Remote teaching with the use of the Internet, which is the focus of the remainder of the paper, will be understood as teaching independent of place, and in the case of most of its forms, also of time, allowing contact between participants in the teaching process characteristic of the widely understood communication via the Web (Stanisławska, 2003). Such teaching, despite its many undoubted advantages, also implies many problems related to the process and effects of education. These will be discussed in the next part of the paper.

Benefits and problems of e-learning in the area of process and learning outcomes – synthesis of research results

The literature on e-learning devotes a lot of attention to the benefits it brings to participants in the educational process. The authors of the publications usually draw attention to the obvious benefits, resulting from the essence of e-learning, which include the convenience of studying (related to the possibility of learning at the place, time and pace chosen by the student), greater accessibility of studies (including the possibility of benefiting from the knowledge and experience of geographically dispersed experts), lower costs of studies (Olszyńska et al., 2021), but they also draw attention to specific ones, resulting from their experience as teachers and researchers of this issue. These are closely related to the continuous development of information technology and the resulting capabilities of modern platforms and programs designed for remote learning. These benefits include:

– the formation of the ability to think independently (Dumford & Miller, 2018), learn and work creatively (with the possibility of implementing also

teamwork, which, however, is more limited than in the case of traditional teaching),

– the possibility of obtaining new or supplementing existing qualifications (*Nauka zdalna na studiach..*, 2023),

– realization of the paradigm of lifelong learning (Czarkowski, 2012),

– greater involvement of participants in the learning process, thanks to the possibility of continuous use of various teaching materials, including texts, sounds, interactive graphics, videos, and the ability to share them with each other (Rusu & Tudose, 2018; Raspopovic et al., 2016),

– lack of "school stress" (Kochan, 2020),

– eliminating the barrier of socioeconomic status (Sannino & Engeström, 2017),

– making new friends with people who are physically distant but close in terms of interests, experiences and problems (Truskolaska et al., 2015),

– minimizing barriers for people with disabilities (Kent, 2015);

– an opportunity to develop social contacts for shy people (Truskolaska et al., 2015),

– freely combining study with work and other responsibilities and with private life (Turan et al., 2022).

The mentioned multifaceted (economic, social, psychological, among others) benefits of e-learning, do not determine its uncritical recommendation, due to the numerous disadvantages of this model of teaching and, according to many researchers, worse educational results (Co et al., 2021) than in the case of the traditional model.

Among the disadvantages of this form of education that take place in the learning process, researchers include:

– the need for appropriate computer equipment, software and Internet access, as well as a larger number of computers in the case of large families, which implies the need for high costs and, in a situation of problems with their possession, the possibility of lowering students' self-esteem, unequal educational opportunities for young people (Krawczyk, 2011),

– inability to study in remote form all fields of study and participate in laboratory-type classes (Krawczyk, 2011),

– problems with the motivation of students to study due to the lack of direct contact with the lecturer and with other participants in the classes and the associated lower opportunities for competition and

cooperation (lack of motivation is also considered an important factor affecting the abandonment of further education) (Davis, 2019; Islam et al., 2015; Raspopovic et al., 2017; Sife et al., 2007),

– social isolation ("loneliness in the Network" syndrome) affecting abnormalities in future social functioning, anxiety during direct contact with other people (Witoń, 2020),

– the risk of deepening students' addiction to the Internet and digital devices (D. Witoń, 2020),

– technical problems during classes and use of teaching materials,

– limited ability to control illegal activities, such as cheating during credits, plagiarism, etc. (Arkorful & Abaidoo, 2015).

– various psychosomatic problems, including those related to lack of concentration, with sleep, with digestion, immunity, fatigue (including – digital fatigue) (*Psychosomatyczne konsekwencje*, 2022),

– symptoms of depression (Kapasia, 2020),

– digital inequalities on the part of both students and teachers, related to the ability to use communication tools such as email inboxes and word processing (Kisanga & Ireson, 2015; Chang & Fang, 2019),

– the tendency to surf social networks during classes, download games and watch YouTube videos, leading to a decrease in concentration during participation in the teaching process (Rawashdeh et al., 2021).

The mentioned inferior effects of remote learning (compared to the traditional form) are mainly due to problems related to the motivation of students to study, individual approach to the student (*Długotrwałe nauczanie...* 2021), learning from electronic sources (which give worse results than printed (Pachociński, 1999) from the fact that reading from a computer monitor is often slower, less accurate and much more tiring than when using the printed form (Góralewska – Słonka, 1999).

The next part of the paper presents selected positive and negative aspects of remote learning in the area of educational process and outcomes as perceived by students of the Rzeszow University of Technology and University of Rzeszow.

Methodology

The purpose of the research was to find out the evaluations and opinions of Rzeszow university students regarding the process and effects of remote

education during the COVID-19 pandemic, as well as their preferences related to the form of education after the pandemic.

The research problem consisted of the following questions:

1) What form of education (desktop, remote or hybrid) do students prefer?

2) Does the preferred form of education differ significantly by mode of study?

3) Does the preference for remote learning differ significantly by mode of study?

4) What are the reasons for students' preferences for particular forms of education?

5) What type of remote learning do respondents prefer?

6) What is the attitude of respondents toward remote learning?

7) Does the attitude towards remote learning differ significantly depending on the mode of study?

8) On which platforms have the surveyed students participated in remote classes and which platform do they rate the best?

9) What impact has remote teaching had on the level of students' knowledge (according to the declarations of the surveyed students)?

10) How did remote teaching affect the well-being and mental state of the surveyed students (according to their opinion)?

11) Would the students like to introduce elements of remote learning also after the pandemic?

The following research hypotheses related to preference for and attitudes toward title remote learning were identified:

1) There is a significant difference between full-time and part-time students in terms of preference for remote learning form.

2) There is a significant difference between full-time and part-time students in terms of attitudes toward remote learning.

The research method applied in the study was an online survey (CAWI) and a face-to-face survey (classic). The measuring instrument was a survey questionnaire (electronic and paper version, respectively). It included closed (with non-metric scales – nominal and ordinal), semi-open and open-ended questions.

The subject scope of the survey included students of Rzeszow public universities, both full-time and part-time. The temporal scope of the entire survey is from November 2021 to January 2022. The survey was carried out in the area of Rzeszow University of Technology and the University of Rzeszow (PAPI method) and on selected online groups of students of these universities, on social media (CAWI method).

The survey was primary (due to the source of information), quantitative (due to the nature of the information) and non-exhaustive (given the selection of respondents for the study).

The sample size accounted for 119 students. The sampling method was non-random sampling (selection of typical units).

Results & Discussion

The metric variable of key importance in analyzing the responses obtained from respondents was the mode of study. Taking this variable into account, the survey included: 72% of full-time students and 28% of part-time students. Taking into account the universities at which the respondents studied, an effort was made to ensure that the size of the two subgroups (there are two public universities in Rzeszow) was similar, but due to the electronic posting of the questionnaire on selected groups on social networks, it was difficult to avoid discrepancies in the number of people who self-recruited for the survey. In the end, 45% of the respondents were students of the Rzeszow University of Technology and 55% were students of the University of Rzeszow.

In the analysis of the data obtained, due to the use of mainly non-metric scales (nominal and ordinal) in the questionnaire, the structures (proportions) of responses, the dominant, tests of significance of differences between selected indicators of structure, for verification of the hypotheses set, and Pearson's $\chi 2$ test (for nominal scales) were calculated.

The first substantive question in the questionnaire concerned the preferences of the surveyed students related to the form of education. According to the survey, the largest group (43% of respondents) declared a preference for the hybrid form (figure 1).
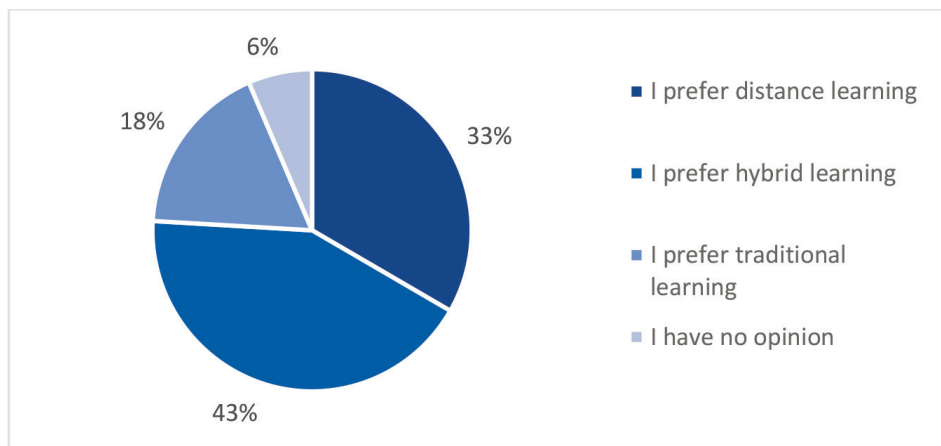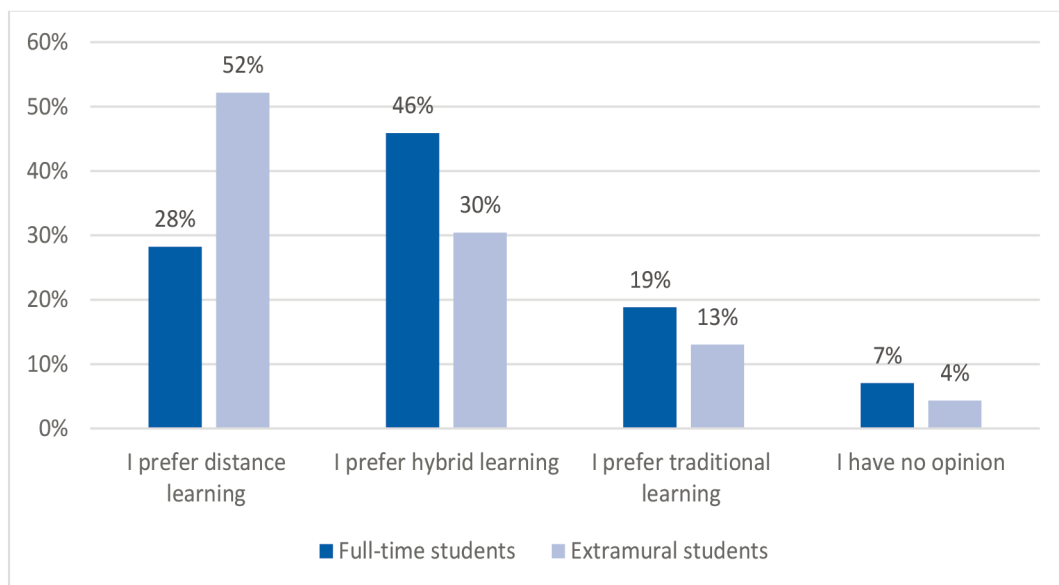
Figure 1 – Students' preferences regarding the form of education.
Source: own study based on completed primary research.

Taking into account the mode of study of the preferred form of education, the greatest differences can be observed in the area of preference for hybrid and remote forms. The hybrid form is preferred by 46% of full-time students surveyed and 30% of part-time students. Remote form, 28% (full-time students) and 52% (part-time students), respectively. Traditional education turned out to be the best form of education for 19% of full-time students and 13% of extramural students (figure 2). Pearson's χ^2 test showed that the difference between the preferences regarding the form of education among full-time and part-time students was not statistically significant ($p>0.05$). On the other hand, the result of the test of the significance of the difference between the preference for the remote form by students of full-time and part-time studies turned out to be statistically significant ($p<0.05$).

Figure 2 – Student preferences regarding the form of education depending on the mode of study
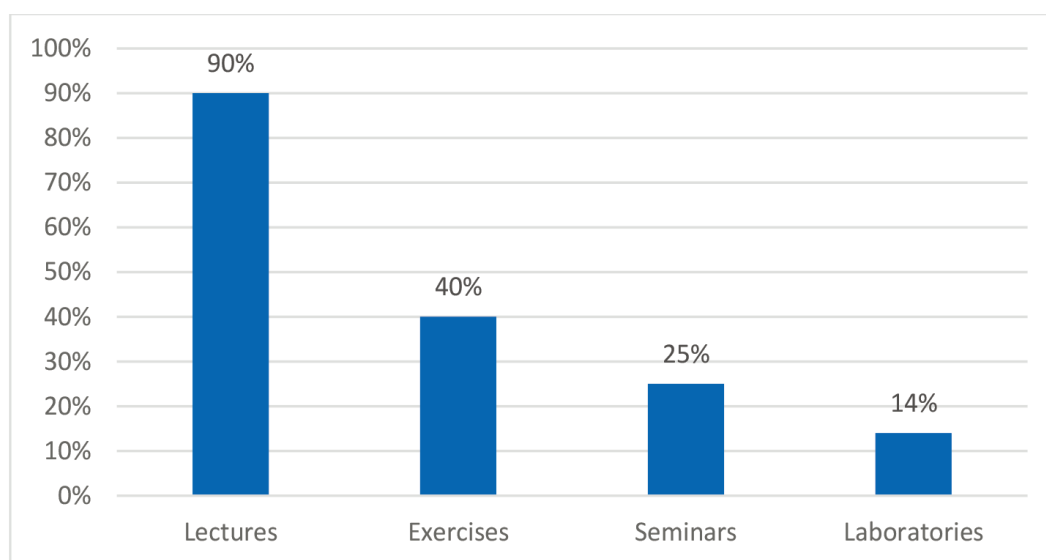Source: own study based on completed primary research.

As for the reasons for preferring the traditional form of education, 45% of the respondents declared that it was better assimilation of knowledge. For 41%, the most important reason is the possibility of direct interaction with other participants in the learning process, and for 14% other (different) factors.

The largest group of respondents preferring teaching in a hybrid form (52% of respondents) justified their choice by the fact that lectures in a remote form were more convenient, for 27% saving time was of key importance, 14% preferred hybrid teaching due to the generally better quality of classes conducted in this way (7% of respondents mentioned various other reasons).

Respondents preferring distance education justified their choice mainly by saving time (60%), for 34% the main reason was convenience, while 6% mentioned other factors justifying their choice.

Respondents preferring remote or hybrid education also answered the question of what specific type of classes they preferred remotely. The vast majority of them (90%) chose remote lectures, followed by exercises (40%), followed by seminars (in remote form they are better than the traditional form for 25% of this group of respondents), while the smallest percentage of respondents (14%) prefers online laboratories (figure 3).


Figure 3 – Type of classes preferred in the remote form
(the sum of the values expressed in % is not 100% due to the possibility of entering more than one answer)
Source: own study based on completed primary research.

The analysis of preferred remote classes, broken down by mode of study and type of student, showed insignificant differences between the obtained values.

When asked about their attitude towards distance education, the majority of respondents (60%) declared a positive attitude. Among the remaining respondents, 22% described their attitude as negative, and 18% did not have a precise opinion on this subject.

Attitudes towards distance education broken down by the mode of study are presented in figure 4. Pearson's χ^2 test showed that the difference between the attitudes towards the form of education among full-time and part-time students was not statistically significant ($p>0.05$). When analyzing the data obtained in percentage terms, it should be stated that a much higher percentage of extramural students (compared to full-time students) has a positive attitude towards the remote form of classes (74% of extramural students compared to 49% of full-time students). This difference is statistically significant ($p<0.05$). However, the difference between the percentages reflecting the negative attitude towards this form of education, broken down by students of both modes of study, is insignificant ($p>0.05$).
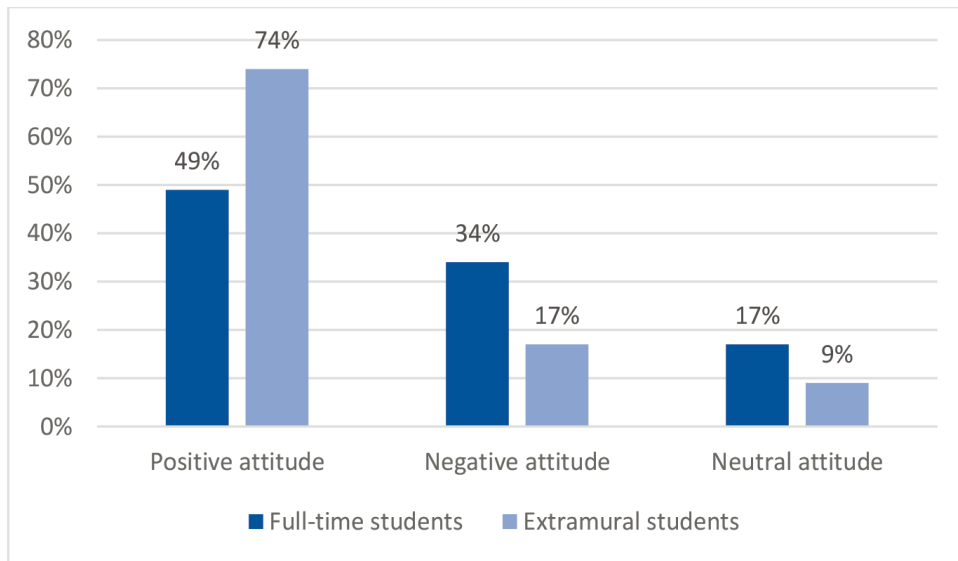
Figure 4 – The attitude of students towards distance learning, broken down by the mode of study
Source: own study based on completed primary research.

The most popular platforms on which remote classes were conducted during the Covid-19 pandemic include MS Teams (96% of responses), Zoom and Moodle (28% each), and Discord (7%). The other platforms mentioned by the students are: Cisco Webex, eduPortal, Blackboard and Skype (figure 5). For the respondents who took part in classes on more than one platform, MS Teams was rated the best.
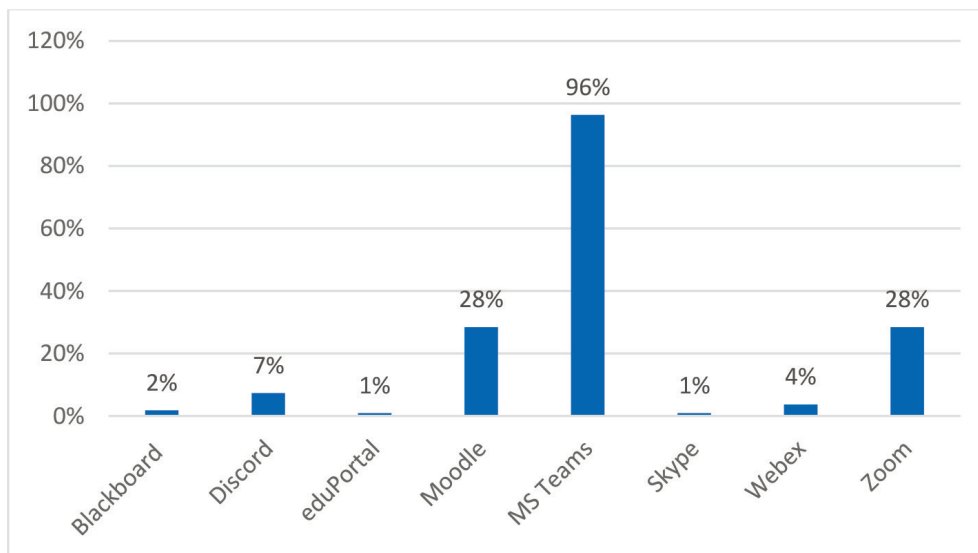
Figure 5 – Platforms where remote classes were conducted
Source: own study based on completed primary research.

According to the largest group of surveyed students (36%), the introduction of remote learning had a negative impact on their level of knowledge (dominant). According to 33% of students, the form of education had no impact on the level of knowledge. For 21%, the level of knowledge was higher (10% had no specific opinion on the subject) (figure 6).
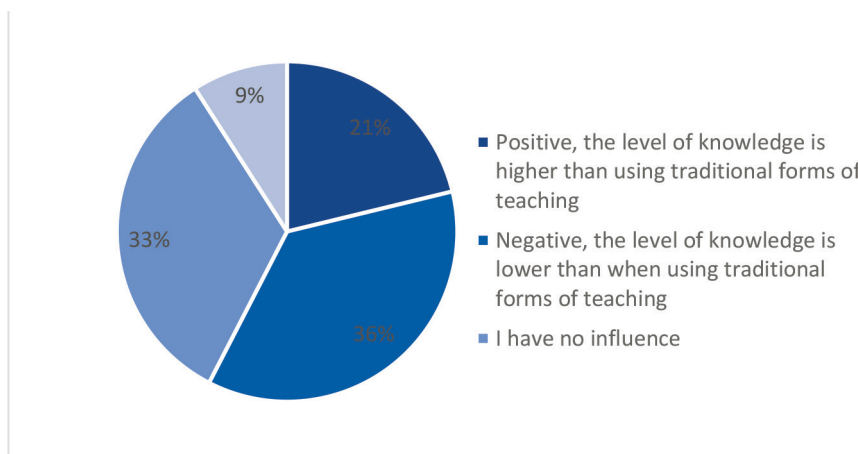
Figure 6 – Impact of distance education on the level of knowledge of students
(according to students' declarations)
Source: own study based on completed primary research.

According to the analysis of the impact of distance learning on the level of their knowledge perceived by students, broken down by the mode of study, the greatest differences in the perception of students relate to the option of a higher level of knowledge in the case of remote learning. Among full-time students, 19% said that remote learning had a positive impact on their level of knowledge, compared to 30% of part-time students.

The impact of distance education on the mental health of students was examined using an indirect (closed) as well as a direct (open) question. The first of them with a Likert scale was aimed at identifying the level of acceptance of the statement "The introduction of remote learning had a negative impact on the mental health of students". Among the students under the survey, 61% agreed with this statement, 21% disagreed, and 18% had no opinion on the matter. When asked about the impact of the introduction of remote learning on their own mental health (direct, open question), students stated in 40% that it had a negative impact on their mental health. For 19% it had a positive impact and for 41% – it had no impact. The negative impact was mainly justified by isolation and limited contact with people. There were also single responses indicating higher stress. Positive was explained by less stress from online classes, time savings for commuting and more time for yourself.

The percentages of answers to the questions about the negative impact of distance learning on the mental health of students, in the indirect and direct form (61% and 40%, respectively), differed significantly ($p < 0.05$) (other answers to the above questions cannot be compared with due to their different meaning – students' disagreement with the statement about the negative impact of distance learning on mental health in the indirect question cannot be compared with the opinion about its positive impact in the direct question).

It is worth noting that full-time students more often complained about the negative impact of distance learning on their mental health (42% of full-time students compared to 30% of part-time students), mainly due to isolation and seclusion. On the other hand, part-time students most often considered that it had a positive impact on their mental state (38% of part-time students to 14% of full-time students), mainly due to less stress related to studying.

In the further part of this section of the paper, the quotes from students' statements related to the justification of the negative impact of remote learning on the mental well-being of students (5 quotes) and then – a positive impact (3 quotes) are presented.

1) *Remote learning was very burdensome, associated with uncertainty, poorer quality of education and lack of contact with other students* (student of part-time studies).

2) *Man is a being who needs a sense of belonging, which is one of their main needs [...]. He needs the contact and touch of another person, which is confirmed by many studies. Personally, I felt a lot of lack of contact with other people, loneliness, isolation, alienation and I felt trapped in my own home* (part-time student).

3) *During remote teaching I felt very isolated, and after that, going anywhere outside the comfort zone became a challenge* (full-time student).

4) *I lost contact with friends and other people, which caused me anxiety and problems with talking to people, which I had not had before* (student of full-time studies).

5) *Stress in the case of remote classes is definitely stronger than in the case of stationary classes. In addition, I isolated myself from other people and sometimes it is difficult for me to communicate even when dealing with ordinary matters* (student of full-time studies).

6) *The awareness that I am safe at home and manage my own time was a plus* (part-time student).

7) *During remote learning, I felt much less stress and pressure* (part-time student).

8) *I could relax more and not be constantly stressed that I would fall asleep in class* (full-time student).

Despite the high percentage of answers confirming the negative impact of remote education on the mental health of students and the level of their knowledge (40% and 36% of students, respectively; these were the dominant answers to the above-mentioned questions), as regards continuing elements of remote education after the pandemic, 72% of the surveyed students (83% of part-time students and 69% of full-time students) expressed their approval for such an idea and 25% of students were against it (4% had no opinion on it).

Conclusion

The research carried out made it possible to achieve the purpose of the paper, answer all the questions in the research problem and confirm the hypotheses. Summarizing the results of the study, it was found that:
-    preferences for the form of education among full-time and part-time students do not differ significantly,

-    the largest group of surveyed students prefers a hybrid form of education,
-    there is a significant difference between full-time and part-time students in terms of preference for a remote form of education (significantly more part-time students prefer this form during their studies),
-    the main reason for the preference of teaching in hybrid form turned out to be the convenience of studying, remote learning – saving time, traditional teaching – better absorption of knowledge,
-    the type of classes, the implementation of which in remote form students assessed particularly positively, were lectures,
-    the majority of students declared a positive attitude towards studying in remote form,
-    the most popular platform for remote classes turned out to be MS Teams, and this platform was rated (by students who participated in remote classes on more than one platform) as the best in the context of remote learning,
-    according to the declarations of the largest (in terms of the number of responses) group of surveyed students, remote learning negatively affected their level of knowledge,
-    regarding the impact of remote learning on the well-being and mental health of surveyed students, almost the same number of them declared its negative impact (this was more often the case for full-time students) and no impact,
-    the negative impact of remote learning on students' well-being and mental health was mainly justified by social isolation,
-    the majority of students surveyed expressed a desire to continue their studies (after the pandemic) using elements of remote learning.

The perceived benefits of e-learning, which mainly include time savings, convenience of studying, less stress during classes, justify the positive attitude of most students towards the remote form of education. The balance of the aforementioned benefits and drawbacks of such a form of education, on the other hand, implies the preference of the majority of students surveyed for hybrid education, which they expect to continue after the end of the pandemic. Taking into account that the best perceived and expected type of classes, in the context of implementation in remote form, are lectures, it is worth considering the possibility of their remote delivery at universities, but with the use of methods, allowing to minimize the disadvantages of such a solution, with particular regard to the sense of social isolation, lower motivation to learn, lower level of knowledge obtained by

students and poor psychological well-being. In this regard, it seems necessary to implement lectures of a conversational nature, using methods that activate students, enabling them to increase their motivation, interaction and integration with other students. The transition from the administration and monologue form that characterizes the classical lecture to the above-mentioned student-activating form of lecture (using, among other things, methods of expression, impression, creative solution of scientific problems presented in lectures, team decision-making and the ability to argue the recommended solutions), re-quires lecturers to make mental and organizational changes, as well as to improve digital competencies related to the operation of educational platforms and the tools used within them. The effort associated with the aforementioned changes is undoubtedly a major challenge, but it seems to be a necessary step to achieve greater teaching effectiveness and meet students' expectations of hybrid education. In this regard, it is worth considering publishing studies, based on research and lecturers' experiences, on how to implement modern e-learning methods and tools for various subjects, majors and fields of study.

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