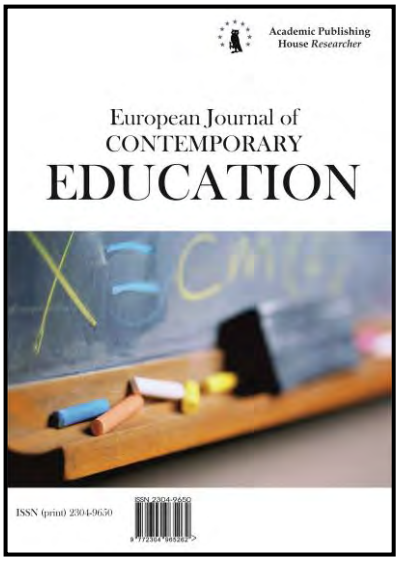
Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 43-52
DOI: 10.13187/ejced.2021.1.43
www.ejournal1.com



Online Student Education in a Pandemic: New Challenges and Risks

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Abstract

The epidemiological crisis made it necessary to transform the practice of higher education in the conditions of transition to remote mode. Online training has become an alternative to the face-to-face format of classes, which updates the analysis of key risks and problems of the educational process in the context of the pandemic. The leading research method was a questionnaire survey of students with online learning experience (N = 146 people). The survey was conducted in May 2020. For a deeper interpretation of a number of conclusions, the authors conducted a focus group in September 2020 (N = 12 people), which included students of 2-3 years of study at Russian universities. The authors set a goal to study the degree of adaptation of students to new learning conditions, the specifics of their perception of various aspects of learning in an online environment, problems and risks. The results of the study showed that every fourth student when switching to online mode could not successfully adapt to the new format of training. It is concluded that the key risks of online learning are associated with the lack of direct communication channels, the spread of the practice of imitating students' learning activities in the context of reducing the control function of the teacher. The lack of readiness of students to maintain the necessary level of self-organization led to a decrease in students' requirements for themselves as an active participant in the educational process, while increasing requirements for digital competencies and personal qualities of the teacher. In terms of online learning, students demonstrate the need for additional measures to maintain interest in learning: game context, network interaction in the "student-student" system, charismatic presentation of material.

Keywords: higher school, online education, digital technologies, digital literacy, pandemic.

1. Introduction

The global pandemic has significantly transformed all spheres of public life. Modern education is facing new challenges due to the need for an urgent transition to online learning

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(Favale, 2020). The urgent transition of face-to-face classes to a remote format required the development of an "online methodology" for higher education (Garcia-Penalvo et al., 2020). This online methodology should be considered as a mechanism for transferring knowledge and developing professional competencies of young people without losing the advantages of face-to-face interaction.

The results of a study conducted by Dubreil S. in 2020 illustrate the threat of violation of the integrity of the educational process in the context of widespread forced transition to online learning. Combining pedagogical tools with game design can be considered as a constructive solution for learning in the era of social distancing (Dubreil, 2020). Expanding the boundaries of these conclusions, Timmis S. and Munoz-Chereau emphasize the importance of improvisation and collective activity in the learning environment, and draw attention to students' informal digital practices (Timmis, Munoz-Chereau, 2019). A group of scientists from Brazil made similar conclusions in a study. It is noted that there is a need to review learning scenarios in the period of isolation, to find a balance between the use of pedagogical skills and information and communication technologies. Scientists point out the risks of social injustice due to heterogeneous access to digital technologies. These trends lead to an increase in pre-existing educational asymmetries in the context of digital inequality (Prata-Linhares, 2020).

Most studies show a positive perception of digital technologies in general, and the possibilities of their use in online learning, in particular. M.A. Shchadnaya's work focuses on increasing the flexibility of the education system, which allows all participants to choose a convenient time for classes, take into account individual characteristics and needs of students (Shchadnaya, 2020). According to medium-term forecasts, the use of digital technologies will increase the effectiveness of education by increasing the manageability of the educational process, the prevalence of data control, de-territorialization of the educational space (Selwyn et al., 2019), the formation of individual educational trajectories of students, differentiation of forms and methods of teaching (Frolova et al., 2020).

However, a number of scientists warn against the perception of online learning as a panacea for education (Menashy, Zakharia, 2019). A number of papers conclude that there is an objective need to rethink educational practices in order to minimize the negative impact of modern information and communication technologies on people (Tyurikov, Bolshunov, 2019). Problems of online learning are associated with a decrease in the level of cognitive skills of students (Vinichenko et al., 2018) and insufficient conditions for the formation of communicative competencies (Cladis, 2018). According to experts, it is particularly difficult to conduct an online assessment of students' knowledge and skills in the new environment, compliance with the requirements of transparency, fairness and legal certainty. Research results have shown that the problem that causes the greatest stress for students is the situation of uncertainty when conducting a semester's knowledge assessment (Moawad, 2020). The loss of transparency in the assessment of knowledge creates additional barriers to student motivation. There is a loss of interest in educational activities, a decrease in the level of students' involvement in the educational process, and a violation of communication both within the study group and with the teacher (Frolova et al., 2019). It should be noted that the specifics of remote interaction between teachers and students in the online learning system is a central topic of research on the transformation of the educational process in the context of COVID-19 (Murray, 2020; Kim, 2020). J.R. Bryson and L. Andres distinguish two forms of interaction: surface and deep. The first of them implies a limited practice of conducting a dialogue with students, while the deep form includes a process of joint creativity and educational reflection (Bryson, Andres, 2020). A study led by Ana A. in Indonesia and Malaysia during the COVID-19 outbreak shows the problem of students' psychological resilience to e-learning systems. It is argued that the lack of face-to-face meetings with the teacher should be compensated by an effective learning strategy based on e-learning activities (Ana et al., 2020) and virtual reality technologies (McGovern et al., 2019).

International research materials demonstrate the importance of taking into account the negative aspects and dysfunctions when switching to online training. In particular, according to a group of researchers led by Bataineh K. B., the majority of students at Jordanian universities are dissatisfied with the online learning experience, as they faced the problems such as low Internet speed, insufficient software availability, and unsatisfactory design of online content (Bataineh et al., 2021).

A possible compensator for the problems associated with low interest and lack of motivation of students in online learning is the use of gamified technologies. Scientists pay attention to the fact that modern students are representatives of the digital generation – Net Generation. The specifics of the socio-psychological portrait of a digital generation student require a close interweaving of formal and informal activities in education. For example, digital comics and other visual effects can help generate sustained student interest and increase their enthusiasm and motivation to learn (Craciun, Bunoiu, 2019). Similar results were obtained in the course of conducting focus groups with graduate and undergraduate students. The respondents' preferences in the practice of online learning were identified: visual elements, interactivity, accessibility, and the use of applied scenarios. Of particular importance for modern students is the teacher's ability to switch their attention to different types of work in a virtual learning environment (Groton, Spadola, 2020).

Conclusions drawn from international research demonstrate the special importance of personal and professional qualities of a teacher in the context of digitalization of education. In particular, attention is drawn to the teacher's experience in the online environment, digital skills, and the ability to use information and communication technologies for data analysis. The conclusion is made about the need for continuous improvement of professional knowledge in the field of digitalization, the formation of a teacher's sustainable desire to improve their skills (Kumar et al., 2019).

2. Methods

In modern scientific and practical literature, there are results of research on the possibilities and effectiveness of using distance technologies in certain segments of educational services. However, there is no analysis of the risks of a widespread transition from face-to-face classes to online training. The authors conducted an intelligence study aimed at studying the degree of adaptation of students to new learning conditions, the specifics of their perception of various aspects of learning online, its effectiveness, problems and risks of negative trends. The questionnaire survey was conducted in May 2020 (N = 146 people). The timing of the study was determined by the formation of students' primary experience in online learning. It is of interest to obtain primary data that shows the most significant problems and dysfunctions that students have encountered.

The study used a random sample. The selection was carried out on the principle of voluntariness and availability of inclusion of units of the general population in the sample. The respondents were students of Russian universities. Signs of representation: the status of a student of a higher educational institution in the territory of the Russian Federation, the experience of online training for at least one month. The last requirement was due to the fact that not all universities were able to implement the practice of switching to online mode. The questionnaire was posted on the platform google.com/forms.

The authors used a set of general scientific research methods and analytical procedures: comparative analysis, classification and systematization of data, analysis of documents and scientific literature. In order to verify the data obtained and increase the expertise of the conclusions made, the authors conduct a comparative analysis of the survey results with empirical materials from other research groups.

In order to verify the data obtained, in September 2020, the authors conducted a focus group with 12 full-time students. The students participating in the survey were sent invitations to a focus group study. Out of 32 students who expressed potential readiness to participate, 12 respondents of the 2nd and 3rd years of study with different levels of academic performance were selected. The 1st and 4th year students were excluded due to the lack of sufficient full-time training experience for the first of them and the special expectations of the final year students.

In the course of data processing and interpretation, the authors used statistical analysis methods. In particular, a correlation analysis was carried out, which was carried out by calculating the Pearson correlation coefficient.

3. Results

According to the data obtained, the majority of students have successfully adapted to the transition to online education. Every third respondent chose the answer "excellent" (33.6 %), "good" – 34.9 %. These proportions fully correlate with the assessment of digital competence of

Russians. The results of the VTSIOM survey illustrate the division of Russian citizens by the level of digital competence into four groups, where 30 % have a high level of proficiency and 32 % are above average. Both in study and in professional activities, there is a pattern between a high level of digital literacy and the success of switching to remote mode of work. At the same time, the majority of Russians (60 %) are quite satisfied with their level of digital skills (VTSIOM website).

The current situation in the higher education system has shown that students in general have switched to online education quite easily. However, there are serious concerns about the fact that every fourth University student was not able to adapt to the changes successfully and, in fact, was excluded from the educational process. In the face of a pandemic and a widespread online transition, these students are a prime example of digital asymmetry. This problem should be considered in the long term, since the untimely adaptation of a significant number of students (25 %) to the new format of education initiates a decrease in the professional knowledge of graduates.

Despite the fact that 2/3 of the respondents are quite optimistic when considering their adaptive capabilities, the assessment of the level of complexity of learning in the online format is centered in a lower range. Just under half of the respondents (39.7 %) said that learning is "difficult" and "rather difficult". The key difficulties of the students relate to technical limitations and lack of feedback from the teacher.

Table 1. Distribution of answers to the question: "What difficulties have You experienced in the transition to online learning?" %

Difficulty	%
No personal computer at home	10,3
The lack of access to the Internet	15,1
Inadequate skills to operate the computer	8,2
Lack of feedback from the teacher	18,5
Other	9,5
There are no difficulties	38,4

Only 38.4 % of the respondents did not have trouble with switching to total online training. These results update the search for key dysfunctions and problems in online learning. During the focus group, the issue of the lack of feedback from the teacher was clarified. There were such judgments as "the feeling that we are communicating with the screen, and not with a real teacher", "you can't see the reaction", "in live communication, it is immediately clear whether I answer correctly or say the wrong thing". In the online communication format, many students pointed out the presence of psychological clamps that do not allow them to freely express their opinions. It is noted that many teachers, working with the presentation, do not turn on the camera and do not use a personalized address to students. For many students, this has become an undesirable form of interaction, and they want to work with cameras turned on to create a sense of presence in a virtual classroom.

Additional problems relate to the level of digital literacy of a teacher. During the focus groups, the students were very ironic about those teachers who do not have basic digital skills and have not been able to improve their ability to work in the digital environment. Among the respondents' responses, there were the following statements: *"it feels like some people are using Skype for the first time", "it's been a month, and some still don't know how to turn on presentations"*. We assume that the lack of primary digital skills of the teacher in the eyes of the students was "excusable" only at first, while the lack of positive dynamics in the acquisition of digital skills undermines the professional authority of the teacher.

When answering the question: "What do you think is changing for the worse with online learning compared to full-time?" students noted the following aspects:

Table 2. Distribution of answers to the question: "What do You think is changing for the worse in online training compared to full-time?" %

Criterion	%
Understanding the material	42,1
Interest in learning	38,6
Possibility to exchange opinions with other students	43,4
Feedback from the teacher	31,7
I can't answer	10,3
Other	0,7
Nothing changes	17,9

Of particular concern is the decline in "interest in learning" and "understanding of the material". These trends, in our opinion, are related to the traditional, face-to-face teaching methodology, while the online format requires updating pedagogical methods and using fundamentally new approaches to interaction with students. The absence of such important advantages of the face-to-face format as eye contact, "holding" the audience's attention, visual control, etc., should be compensated by the introduction of innovative digital learning technologies.

According to the students, the effectiveness of online learning is reduced due to such factors as lack of live communication (52.1 %), lack of interactivity (7.5 %), routine (3.4 %), heavy loads (15.9 %). These problems could not but affect the motivation of the students to acquire new knowledge. The research materials showed that only one in five students rated their level of motivation as "excellent". More than a third of the respondents gave negative ratings on this issue (23.3 % – "satisfactory", 15.1 % – "bad").

During the focus group discussion, more than half of the participants indicated that their level of motivation decreased when switching to an online training format. For some students who showed high academic performance, the situation was most stressful.

Table 3. Dependence of students' academic performance and motivation to acquire knowledge online (based on the results of the focus group), N = 12

Has the motivation to learn online decreased	Progress of students			Total
	Good	Average	Bad	
yes	4	3	0	7
no	1	2	2	5
Total	5	5	2	12

The value of the Pearson's chi-square test is 3.771. At a significance level of $p < 0.05$, the critical value of x^2 is 5.991. The relationship between factorial and performance characteristics is not statistically significant, the significance level is $p > 0.05$ ($p = 0.152$). Based on the data obtained, it can be concluded that in general, student performance does not significantly affect the change in the level of motivation of students.

However, according to the results of the focus group study, students with a high level of academic performance report a decrease in the level of satisfaction with the quality of online education. The following opinions were expressed: *"I like to make a presentation in front of an audience, get recognition of my success", "when I make a report on Skype, I'm not sure that people are listening to me, maybe everyone is going about their business, with me in the background".* Interestingly, when the students were asked whether they listen carefully to their classmates and teachers, many admitted that they combine classes with other forms of activity: *"I text in WhatsApp", "I can read a book", "I log into social networks".* Based on the responses received, it can be concluded that students reduce their requirements as active participants in the educational process.

Another negative consequence of switching to online education was a drop in interest in studying. Note that the research by K.F. McLay and P.D. Renshaw positions the opinion that an educational institution acts not only as a knowledge constructor, but also as a place of

communication and socialization of students (McLay, Renshaw, 2019). Most of the respondents, having lost the opportunity for informal communication that accompanies the educational process, felt like in a social vacuum.

Table 4. Dependence of students' motivation and feedback quality assessment in the online learning environment, pers

Motivation to gain knowledge in online learning	The quality assessment of feedback between a teacher and a student					Total
	Excellent	Good	Satisfactorily	Badly	I can't answer	
Excellent	12	14	4	0	0	30
Good	12	32	8	1	0	53
Satisfactorily	2	15	12	2	1	32
Badly	0	0	2	2	1	5
I can't answer	8	11	6	0	1	26
Total	**34**	**72**	**32**	**5**	**3**	**146**

The value of the Pearson's chi-square test is 52.635. At a significance level of $p = 0.01$, the critical value of $\chi 2$ is 32. The relationship between factorial and performance characteristics is statistically significant, the significance level is $p < 0.01$.

The data obtained illustrate the relationship between students' motivation to acquire knowledge in online learning and their assessment of the quality of teacher feedback. This relationship allows us to conclude that it is necessary to search for new communication channels that correspond to the format of online work. In the conditions of offline learning, students' communication needs are met within the limits of the time allotted for training sessions. In the online format, when students are limited (psychologically or for technical reasons) in the ability to ask a question or participate in a discussion, feedback should be built on a different principle.

The data obtained correlate with research conducted by the public opinion foundation (POM). To the question "Why do you like studying online less than studying in a normal mode?", a third of the respondents (33 %) chose the answer option: "not enough communication with peers". Every fifth respondent (19 %) noted the lack of communication with the teacher, the lack of his explanation of educational material. In addition, among the disadvantages of online learning, the respondents highlight the inability of students to concentrate on the learning process (44 %), as well as difficulties in mastering the material (37 %) (Distantsionnoe obuchenie shkol'nikov).

During the focus group study, the students noted that despite the use of traditional pedagogical tools by the teacher (lecture presentations, preparation of reports at seminars, case analysis, etc.), the overall level of satisfaction with the quality of training decreased when switching to online mode. The following opinions were expressed: *"I listened to the lecture, the material seems interesting, but I can't bring myself to focus", "the online seminar is almost always boring", "nothing seems to have changed, but it doesn't inspire".*

Table 5. Distribution of answers to the question: "Do You agree with the following statements?", %.

Statements	YES	NO
Interest in learning online depends on the charisma of the teacher	79,5	20,5
Interest in learning online depends on the teacher's ability to «teach to entertain»	57,5	42,5
Interest in learning online depends on the level of use of digital innovation technologies (networking, gamification, virtual reality technologies)	72,6	27.4
Online education today does not meet the needs and interests of students, and interactive digital technologies are not fully used	53,4	46,6
Teachers are ready to work online and have a high level of digital competence	69,9	30,1

During the study, the students were asked to express their agreement or disagreement with a number of statements. The following statements received the greatest support from students: "interest in learning online depends on the charisma of the teacher" (79.5 %) and "interest in learning online depends on the level of use of digital innovative technologies" (72.6 %). Thus, the unity of personal qualities of a teacher and their digital competencies is a necessary basis for a successful transition to online learning. In the new conditions, students' need for additional drivers to maintain their interest in learning increases. Thus, more than half of the respondents consider it necessary for a teacher to have the skill "to entertain when while teaching". Today, students focus on information and communication technologies that do not so much provide knowledge transfer as allow them to use the game format for completing work tasks: network interaction, gamification, virtual reality technologies, etc.

It is worth noting that the students also highlighted the positive consequences of switching to online education. In particular, the rating is headed by the ability to save time on the road (63 %) and increase the manageability of the educational process (the ability to re-watch the video – 19.9 %, download video materials of the lecture – 6.8 %).

At the same time, these positive consequences become a predictor of the dysfunctions mentioned above. Saving time is accompanied by a combination of educational activities and leisure activities. With a reduced threshold of control (no eye-to-eye contact), many students do not spend time revising the material before class, preparing the workplace, and psychological attitude to work.

4. Discussion

The spread of the COVID-19 epidemic has initiated unprecedented measures for the widespread transition to online learning. The phenomenon of online learning has been the subject of international and Russian interdisciplinary research conducted by both major research centers and individual groups of researchers. The need for self-isolation determined the closure of universities to attend, forcing most students to switch to online education.

The opinions of students and teachers are dominated by polar assessments of the transition to online learning: from very optimistic, associated with saving time and improving the manageability of the learning process, to very pessimistic, due to low adaptive capacity, the complexity of organizing effective communications. The results of the study showed that the essence of this problem lies somewhat deeper and is directly related to digital inequality. According to a number of experts, the availability of financial resources becomes a condition for obtaining digital competencies (Manikovskaya, 2019). This conclusion is supported in the materials of the author research. According to the respondents, the main difficulties in switching to online training are associated with insufficient technical support and poor development of digital skills.

It is worth noting that the growth of requirements for digital skills of participants in the educational process, which has been observed for quite a long time, is a response to the challenges of the new digital reality. However, the epidemiological crisis suddenly put both students and teachers in need of updating these skills. Many of them were not ready for the new realities. Expert assessments illustrate a significant gap in the digital skills of young people related to their socio-economic status (Ma, Vachon, 2019). It can be assumed that the long-term presence of students in online education will contribute to maintaining and exacerbating digital inequality.

Another problem is the lack of adaptation of the full-time format of the teachers work with students to the online mode. The study notes the widespread practice of replicating pedagogical tools and techniques that have shown effectiveness in the face-to-face format of conducting classes. At the same time, when studying online, students have trouble with focusing and motivation to study. The results of the study demonstrate the increased requirements of students to the charisma of the teacher, his ability to "to entertain while teaching", the use of digital innovative technologies. A student and a teacher, faced in a single digital space, showed different levels of digital literacy development. A significant proportion of teachers, according to students, showed a lack of basic skills in working in a digital environment, which showed their vulnerable position on this issue. The results of the focus group illustrated the decline in the authority of those teachers who experienced particular difficulties in organizing their educational process. This problem is typical not only for the Russian higher education system, but also for other developed countries. In particular, there are difficulties in implementing digital technologies in the educational process

due to the insufficient level of training of teachers, their low motivation to develop digital competencies. Measures to solve these problems can include didactic and methodological training of teachers (Zahorec et al., 2019; Chapman et al., 2010); formation of an effective motivation system, and tutor support (Fleisch et al., 2016)

Another problem in online learning is the lack of face-to-face communication practices and the low efficiency of the selected communication channels. Indirect communication with the teacher through the computer screen reduces the students' emotional involvement and the activity of his position in the learning process. The results of the study showed a correlation between students' motivation to study and the assessment of the quality of feedback from the teacher. It is suggested that student-teacher interaction can be developed through face-to-face meetings and/or e-learning activities. This aspect requires further research to find forms of communication that demonstrate the highest degree of effectiveness.

The lack of direct control of the teacher allows students to combine other forms of activity that are not related to their studies. The extreme form of this dysfunction is the imitation of the presence of students in the classroom. Additional research is required to control the involvement of students in the learning process.

Despite a significant body of work devoted to the problems of organizing online education in higher education, there are no assessments of the risks of switching to online education for modern society in the medium term. In particular, the cumulative percentage of students who failed to adapt to the new format of the educational process varies from 20 to 25 % according to various studies. Being "on the sidelines" of the educational process, this social group not only has a low level of competitiveness in the labor market, but also provokes the deprivation of the professional status of certain types of work.

5. Conclusion

In the course of the study, the authors made a number of conclusions that will make us rethink the risks of switching to online training. The optimistic assessments of the use of remote technologies and stereotypical assessments of digital literacy of modern youth that are dominating in the scientific literature today are based on research materials that demonstrate high adaptive capabilities of students. At the same time, the results of the author's research illustrate the need to draw the attention of the scientific and pedagogical community to the "risk zone", namely, a quarter of students who have difficulties and/or have not been able to adapt to the online learning format. This is due to the fact that the question of the advantages and disadvantages of working online should be somewhat broader and take into account the forecasts of this group of students entering the labor market. It can be assumed that the problems that led to unsatisfactory adaptation of some students, according to the pedagogical community, are temporary in nature, and will be resolved when the quarantine restrictions are lifted. However, we believe that today we need to develop a methodology for online learning, which will eliminate the resulting dysfunctions.

The study found that the key problems of online learning are the following: reduced level of students' motivation, in some cases imitation of student" presence at an online class, unsatisfactory feedback, reduced opportunities to control the students' work, etc. The problem of material and technical provision of online training is quite acute. The results of the study showed that students very poorly perceive online education as an adequate substitute for full-time education. In a remote format, many students have lowered their requirements for themselves as participants in the educational process. At the same time, the requirements for the digital competencies of the teacher and their ability to teach using gamification elements are increasing.

6. Limitations

The limitations of this study include the use of spontaneous sampling, which does not fully ensure representative representation of all socio-demographic groups of students. Intelligence research justifies the choice of a spontaneous sample, but further analysis of distance learning problems requires coverage of a wider range of respondents with all the characteristics of representation. Additional limitations are associated with the specific application of qualitative research methods, in particular, focus groups.

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