

The Quality of Interaction with Teachers During the Forced Transition to E-learning: Assessments of the Pedagogical University Students *

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Abstract

The article presents the results of a survey among 2801 pedagogical university students. The research was conducted during a forced transition to e-learning in connection with the Covid-19 pandemic (spring 2020).

Students noted a decrease in the quality of interaction with teachers associated with transition to e-learning. The resources for maintaining evaluations of interaction were stage of studying at the University, experience in using an electronic learning management system, and preference to computers/laptops (as opposed to smartphones) as tools for educational activity.

Keywords: *e-learning, Covid-19-Emergency-Remote Teaching, pedagogical university, students, teachers, interaction*

1 Introduction

The forced transition to e-learning with the use of distance learning technologies, which occurred in the spring of 2020 and was caused by the COVID-19 pandemic, determined the opportunities for studying the psychological effects of integrating online technologies into the educational process of universities. The urgency of this transition was determined by the lack of time to prepare for a full e-learning format. This feature of current situation in higher education is reflected by the concept “Covid-19-Emergency-Remote Teaching”, which is widely used today in scientific publications [Radu et al., 2020], [Nokukhanya et al., 2021], [Czerniewicz et al., 2020]. The specifics of the emergency transition to e-learning do not allow us to fully use the information about the psychology of planned e-learning to understand the patterns that emerged during the pandemic. Each of these patterns, which were described before the forced transition to e-learning, needs to be empirically verified under new terms [Krüger et al., 2020].

This article discusses the results of a study aimed at analyzing university students’ evaluations of the quality of online interaction with teachers as the most important prerequisite for the effectiveness of the educational process, and at identifying organizational factors that can influence these evaluations.

Socio-psychological studies suggest that the most vulnerable components of interaction in the online format are the transmission of educational content from teachers to students [Chapin, 2018], as

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well as feedback between teachers and students [Cole et al., 2017]. In this regard, our study tested the hypothesis was about decreasing the quality of interaction between teachers and students (in students' evaluations) in a situation of forced transition to e-learning. With the support of our previous studies [Miklyayeva and Bezgodova, 2020], [Panferov et al., 2020], we considered educational stage, experience in using an electronic learning management system implemented in educational process, as well as students' preference for a technical device as a tool for e-learning activity as the organizational factors that can hypothetically mediate changes in the students' evaluations of quality of interaction with teachers in the situation of Covid-19-Emergency-Remote Teaching.

2 Literature Review

Socio-psychological aspects of learning, which are associated with the interaction between the subjects of the educational process, are one of the most sensitive factors during Covid-19-Emergency-Remote Teaching, since the main changes of lockdown affected the areas of social interaction [Krüger et al., 2020]. Studies conducted around the world in 2020-2021 during Covid-19 pandemic show that students reported a decline in the quantity and quality of interaction with teachers. Moreover, students noted that the interaction formats available to them in the context of the pandemic do not meet their expectations for communication with teachers, control and feedback [Yang et al., 2020a], [Yang et al., 2020b], [Gabelaia and Vasadze, 2021], [Gaglani et al., 2021].

The lack of social interaction is a problem for many students during the lockdown period [Ewing, and Cooper, 2021]. The reduction in interaction between teachers and students is accompanied by decreasing student involvement in the educational process and declining their motivation [Frolova et al., 2020]. Studies show that during the pandemic lockdown students most often prefer synchronous classes (i.e., direct interaction with teachers using information and communication technologies), which allow them to maintain engagement and motivation by mitigating feelings of isolation [Nguyen et al., 2021]. Other organizational measures that teachers have taken to maintain a social presence when face-to-face contact is not possible also demonstrate a positive impact on students' satisfaction with the educational process during the pandemic [Munoz et al., 2021], [Langegård et al., 2021] and the quality of life of students in general [Silva et al., 2021], including personalized and supportive feedback [Istenič, 2021].

The empirical results from different countries indicate that first-year students experience a reduction in interaction with teachers much more acutely, in comparison with students of advanced stages of education. Thus, they significantly lower estimate the quality of interaction with teachers during the lockdown period [Sarwar et al., 2021]. There is the evidence that maintaining active contacts between first-year students and teachers is an important factor in overcoming the anxiety associated with lifestyle changes and the uncertainty of the Covid-19 pandemic situation [Srivastava et al., 2021]. In turn, students of advanced educational stages demonstrate a higher readiness to learn in the context of reduced interactions with teachers [Yu, 2021], which may be related to their more stable motivation [Tang et al., 2021].

Another reason that could explain the difference in evaluations of the with teachers, as well as its importance for successful learning, is due to the fact that senior students are usually more competent in using specialized electronic tools that organize their interaction with teachers during the Covid-19-Emergency-Remote Teaching. Thus, previously to the Covid-19 pandemic, many universities applied the course management systems (e.g. Moodle et al.) as an additional tool to support the educational process, which was used only sporadically by students [Zharova et al., 2020]. During pandemic lockdown, the intensity of work with them has increased significantly [Dascalu et al., 2021]. The increase in the intensity of use of course management systems resulted in increasing mediacompetence of students [Vite León, 2021] and created a more favorable learning environment for students who are proficient in these tools. Empirical studies indicate that the greatest number of problems was observed in those educational institutions that had little experience of e-learning before the pandemic

and were not ready to learn using electronic educational tools [Narang et al., 2021].

One of the problems faced by students during the period of intensifying work with electronic educational tools was the need to use different electronic devices [Naddeo et al., 2021]. Studies conducted prior to the COVID-19 pandemic show that computers, laptops, tablets, and smartphones provide different capabilities for learning and communicating tasks due to specific functionality (keyboard, screen size, etc.) [Dashtestani, 2015], [Vazquez Cano et al., 2018], [Witecki and Nonnecke, 2015]. In general, devices with a larger screen size and keyboard are likely to provide more opportunities for solving educational Problems related to information processing, while smartphones, on the contrary, contribute to more successful communication. Our previous research has shown the benefits of computers and laptops for maintaining students' engagement in the educational process in a situation of Covid-19-Emergency-Remote Teaching [Miklyeva and Bezgodova, 2020].

In general, the literature review allows us to conclude that the organizational factors that could affect the quality of interaction between students and teachers during the Covid-19-Emergency-Remote Teaching are quite diverse. Among them, it is necessary to highlight the stage of education, the previous experience of using specialized educational tools and the characteristics of electronic devices used by students to organize interaction with teachers in educational process. However, we should note that the literature review includes empirical data, which were obtained by researchers in different countries. These data may not be fully reproduced in the context of a particular country due to the organizational specifics of the educational system and the specifics of educational policy during the Covid-19 pandemic. Therefore, before applying in educational practice, it is necessary to test them empirically, taking into account the educational realities of a particular country. In our study, the verification of these patterns is carried out for Russian education on the model of the functioning of a pedagogical university during Covid-19-Emergency-Remote Teaching, since the teacher's profession belongs to the socioeconomic class, where the interactive aspect is critically important. We assume that these features of pedagogical education provide identify existing trends more clearly.

3 Current study

The current study was aimed at identifying the organizational factors that determine university students' evaluations of the interaction with teachers during Covid-19-Emergency-Remote Teaching. The research program involved the search for answers to the following research questions:

- How do students evaluate the change in the quality of interaction with teachers during the Covid-19-Emergency-Remote Teaching?
- How do organizational factors (such as the educational stage, the experience of using electronic educational tools and the electronic devices that are used to work with them) affect these evaluations?

We tested the hypothesis that factors that determine the preservation of favorable evaluations of the interaction with teachers are more senior stages of education, higher competence in using the electronic educational tools and systems, as well as a preference for electronic devices that provide more favorable opportunities for solving educational problems.

4 Materials and methods

The study involved 2801 students enrolled at undergraduate programs of the Herzen State Pedagogical University of Russia, including 906 first-year students, 707 second-year students, 543 third-year students, and 645 fourth-year students. The study was conducted in the spring of 2020 during the Covid-19-Emergency-Remote Teaching, when the educational process was organized using the elec-

tronic learning management system Moodle. The survey was implemented using the online service Google Forms.

The questionnaire included questions that allowed students to describe changes in their interaction with teachers in terms of the quality of feedback from teachers, the clarity of the presentation of educational content and the productivity of interaction with teachers in general (the question “Evaluate the changes that have occurred due to e-learning using distance technologies in comparison with contact work in the classroom”; parameters “quality of feedback from teachers”, “clarity of the presentation of the educational content by teachers”, “productivity of interaction with teachers” (integral parameter); answer options: “significantly deteriorated”, “slightly deteriorated”, “did not change”, “slightly improved”, “significantly improved”). At the stage of processing the results these answers were translated into a numerical scale and encoded in the range from -2 (“significantly deteriorated”) to +2 (“significantly improved”). To assess the variables that were considered as potential factors determining the evaluations of interaction with teachers, closed questions were used: “How often did you use Moodle before the period of e-learning using distance technologies?” (answer options: “never”, “rarely”, “often”); “What course do you study in?” (“in the first”, “in the second”, “in the third”, “in the fourth”); “What do you prefer to use in the educational process?” (“computer/laptop”, “smartphone”, “tablet”). After initial processing, 11 respondents were excluded from the analysis, because they noted that they had only one device freely available and, accordingly, had no choice, as well as respondents who indicated a tablet as their preferred device, since their number was not comparable to the number of groups of respondents who reported a preference for a computer/laptop or smartphone (n=68, n=2159 and n=563, respectively).

Statistical processing of the empirical data was carried out using the software package “Statistica 10.0” and included the calculation of descriptive statistics, frequency analysis and ANOVA analysis of variance (F).

5 Results

The empirical results show that students generally noted a deterioration in the quality of interaction with teachers during the Covid-19-Emergency-Remote Teaching in all the assessed parameters, while the parameters “clarity of presentation of the content” and “productivity of interaction” suffered more than the parameter “quality of feedback” (see Figure 1).

The frequency analysis, however, suggested that the respondents’ evaluations were not uniform. About a third part the students did not notice significant changes in the interaction with teachers (according to the parameters proposed for evaluation), and about one in five students reported an improvement in the quality of this interaction (see Table 1).

The degree of influence of these factors is illustrated in Table 2.

A refinement of the results of variance analysis is shown in Figures 2-4. Thus, it was found that the decrease in the quality of interaction with teachers during the Covid-19-Emergency-Remote Teaching is determined by the experience of working with specialized electronic educational tools used by teachers: the most striking decrease is observed in students with minimal user experience, more stable evaluations – in students who had actively used the relevant educational tools before the outbreak of the pandemic and had extensive experience with them (see Figure 2).

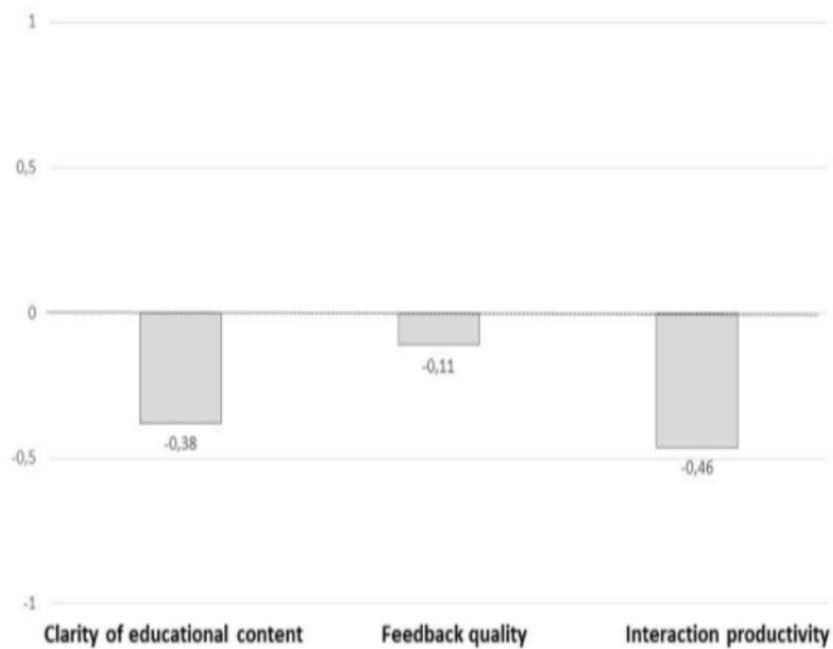


Figure 1: Students' evaluations of changes in the quality of interaction with teachers during the Covid-19-Emergency-Remote Teaching

Table 1. Number of respondents who evaluated the changes in the interaction as "improvement", "deterioration" or "no change" (%)

Evaluation parameters	Evaluation of changes due to Covid-19-Emergency-Remote Teaching		
	Improvement	Deterioration	No changes
Clarity of educational content	17.46	41.38	41.16
Feedback quality	28.10	35.38	36.52
Interaction productivity	21.56	50.95	27.49

Table 2. The results of the variance analysis.
Note: * – $p \leq 0.05$; ** – $p \leq 0.01$; *** – $p \leq 0.001$

Dependent Variables	Independent variables		
	experience of the Moodle use	Stage of education	Preferred device
Clarity of educational content	13.63***	3.03*	0.61
Feedback quality	8.42***	0.59	0.01
Interaction productivity	9.61***	5.08**	6.41***

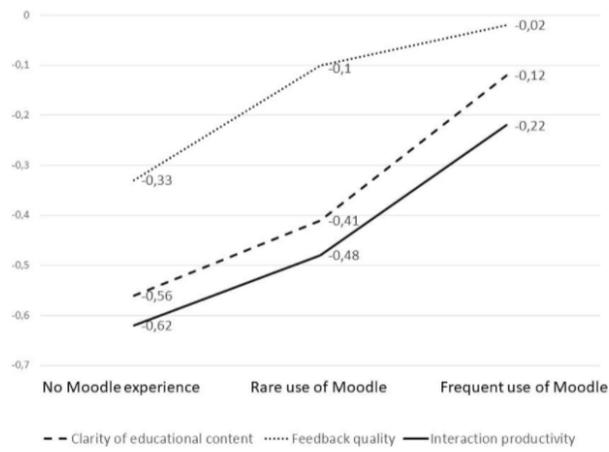


Figure 2: Average evaluations of the quality of interaction with teachers among students with different experience in Moodle

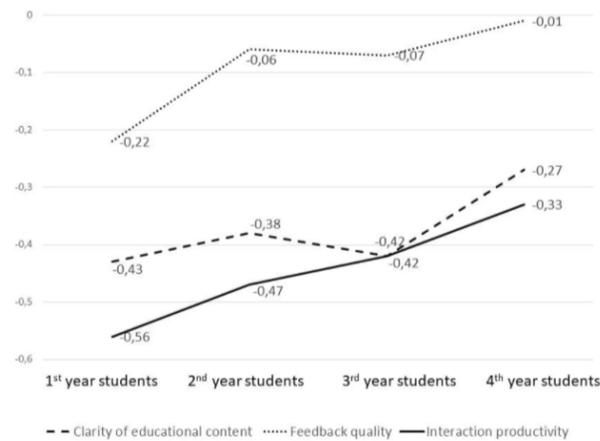


Figure 3: Average evaluations of the quality of interaction with teachers among students with different experience in Moodle

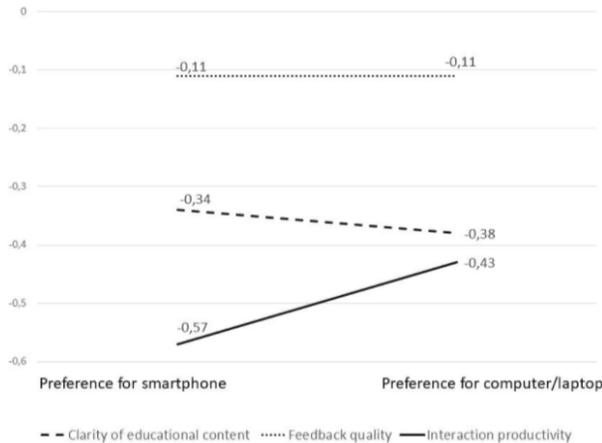


Figure 4: Average evaluations of the interaction with teachers among students who prefer different technical devices in online learning activities

Another important resource for preserving “pre-pandemic” evaluations of the interaction with teachers turned out to be the learning stage. Senior students mostly retained the evaluations of the interaction with teachers that were formed during “face-to-face” learning, in comparison with junior students, and the relationship between the evaluations of the interaction and the educational stage was almost linear (see Figure 3).

In addition, the evaluations of the productivity of online interaction with teachers, which is considered by us as an integral evaluations of the quality of this interaction, was influenced by the preferences that students demonstrated when choosing the “tool” of their online learning activity. Students who preferred a computer or laptop, to a lesser extent, reported a decrease in the productivity of interaction with teachers, in comparison with those who predominantly used a smartphone (see Figure 4).

This relationship does not depend on the educational stage or experience in MOODLE, so we can consider the preference for a particular technical device as an independent factor that mediates the assessment of the quality of online interaction with teachers.

6 Discussion

Our research was aimed at identifying some organizational factors that influence the university students’ evaluations of the interaction with teachers during the Covid-19-Emergency-Remote Teaching. At the first stage of the study, in accordance with the first research question, we analyzed how students evaluate changes in interaction with teachers that occurred due to the Covid-19-Emergency-Remote Teaching. The results showed that students generally evaluated these changes as negative, impairing the quality of interaction with teachers. The tendency to state the deterioration of the interaction is observed, first of all, in relation to the generalized evaluations of the productivity of interaction, as well as in relation to the comprehensibility of educational content. At the same time, feedback quality evaluations were significantly less affected. Thus, we can assume that students note a decrease in the quality of interaction with teachers primarily as the reason for the deterioration in the assimilation of educational content, while feedback from the teacher, in their opinion, remains almost at the same (“pre-pandemic”) level. However, in general, these results are consistent with the data of other researchers that in the conditions of the Covid-19-Emergency-Remote Teaching, student eval-

uations of the interaction with teachers decrease [Yang et al., 2020a], [Gabelaia and Vasadze, 2021], [Gaglani et al., 2021].

At the same time, it is important to note that the downward trend in evaluations of the quality of interaction with teachers in e-learning under lockdown conditions is not the same for all students who participates our survey. A decrease in the quality of interaction with teachers was reported by about a half of the students, while the rest part of sample stated that there were no significant changes or, in some cases, an improvement in certain aspects of communication in the “teachers-students” system. This fact highlights the heterogeneity of the student community, faced with the problem of the Covid-19-Emergency-Remote Teaching, and confirms the relevance of search for factors that mediate students’ evaluations of the quality of interaction with teachers in the learning environment using e-learning technologies.

In accordance with the research program, we studied the influence of some organizational factors on students’ evaluations of changes in interaction with teachers during the lockdown period. These factors included the stage of study at the university, the experience of using specialized electronic educational tools and the type of electronic devices that students prefer to work with them.

The results of the variance analysis clearly show that the previous experience of working with the course management system (for the interviewed students – Moodle) turned out to be an extremely important resource for maintaining the stability of evaluations of the interaction with teachers in a situation of forced transition to e-learning. Higher evaluations of the interaction with teachers during lockdown were demonstrated by students who, by the time of switching to the e-learning format, had a fairly extensive experience in using Moodle in educational activities. Probably, the previous experience determines the formation of “mediacompetence” [Vite León, 2021], [Narang et al., 2021], which allows students to better navigate the course materials, ways to maintain contacts with teachers and receive feedback, which, together with other factors, provides students with the opportunity to maintain relatively favorable evaluations of the productivity of interaction with teachers online (in comparison with students who do not have similar experience). In general, our empirical data support the results of other studies on the importance of mediacompetence as a resource for maintaining productive interaction with teachers in conditions of Covid-19-Emergency-Remote Teaching.

In addition, our empirical data confirm the impact of the education stage on students’ evaluations of the quality of interaction with teachers in an online format [Sarwar et al., 2021], [Srivastava et al., 2021], [Yu, 2021]. Senior students generally showed higher evaluations of the interaction with teachers than students who are at the initial stages of higher education. Probably, the educational experience of undergraduates allows them to better interact with teachers and understand their ideas, while students of primary courses may have difficulties in these matters. It is quite possible that the above-mentioned influence of the Moodle experience on the evaluations of interaction with teachers in the context of the pandemic is also associated with the educational stage. This assumption can be made in accordance with the similarity of the profiles of students’ evaluations of interaction with teachers, which were obtained analyzing such independent factors as the educational stage Moodle experience.

Special attention should be paid to the fact that the electronic devices used by students to solve educational problems affects their evaluations of the productivity of interaction with teachers. Although the best opportunities for communication are usually created by the smartphone [Dastestani, 2015], [Vazquez Cano et al., 2018], [Witecki and Nonnecke, 2015], the preference for a computer/laptop contributed to improving the quality of interaction with teachers. Probably, this contradiction is explained in following way: interaction with the teacher, being embedded in the educational activity, carries not so much a communicative as an educational load, and therefore the most beneficial effects are associated with the use of those devices, which ensure the quality of educational activity as a holistic process.

The results of our study indicate that in terms of the Covid-19-Emergency-Remote Teaching university students are not a homogeneous group, and their educational activity is mediated by various

factors, including factors related to the organization of the educational process. Extrapolating the results which were obtained during the lockdown period to the future stages of e-learning development, it is necessary to take into account that the readiness for productive interaction with teachers is higher among senior students who have more experience in using specialized electronic educational resources that are incorporated in the educational process. Accordingly, special attention should be paid to the formation of mediacompetence of students. As we know, the previous ideas about a high level of user competence of students [Prensky, 2001] often do not correspond to reality when it comes to questions of competencies necessary for solving educational problems [Head, and Eisenberg, 2011], which is also typical for the students who were included the sample of our study [Ikonnikova et al., 2020]. Introducing elements of e-learning at the first stages of students' university life, it is very important to focus on the ways of interaction between students and teachers accepted at the university. A special task is related to actively informing students about the opportunities and limitations of using various technical devices to solve educational problems.

In conclusion, we should outline the limitations of our study. First of all, our study took into account students' evaluations of interaction in the "students-teachers" system, while the teachers' representations were ignored. In addition, we involved students of the pedagogical university. In such sample, the skills of interaction with other people are important professional competences. But we did not study evaluations of the interaction with teachers which would be formulated by students of non-pedagogical specialties. Overcoming these limitations is the perspective of our research.

7 Conclusions

In the situation of forced transition to e-learning students note a decrease in the quality of interaction with teachers. The resources for maintaining stable evaluations of the quality of interaction are the stage of studying at a university, previous experience in using an electronic learning management system, and the preference for a computer or laptop as a tool for e-learning activity. These results should be taken into account for planning measures connected with transition to the implementation of educational programs in a mixed format, which is now becoming one of the priority areas for the development of the higher education system.

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