



# Psychological Difficulties of Adopting Distance Education Technologies in Higher Education During the COVID-19

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## ABSTRACT

The subject of the study is the psychological difficulties of adopting distance education technologies by university students. The materials of exploratory research obtained on a sample of students from several universities of the Sakha Republic (Yakutia) are presented. The study involved respondents aged 19 to 22 (N = 86), 39% of whom were males. In the research, the unstructured interview method was used, during which we asked students to share in detail about their user experience, describing not only the learning process itself but the whole learning context in general. Considering the results using the TAM model, it can be assumed that students are not satisfied with any of the components. Distance learning technologies are not perceived by students as easy to use, and there is a low assessment of the perceived usefulness of these technologies. The attitude towards technology is also rather negative. From the point of view of student acceptance of technology, it can be said that distance learning causes some difficulties associated with cognitive, and emotional aspects, as well as interaction in a virtual environment, and the learning process. Learning creates anxiety and dissatisfaction with the learning process itself.

**Keywords:** distance education, psychological difficulties, pedagogical communication, students, technology adoption model (TAM)

## INTRODUCTION

Distance education is a complex system in which the interaction between the actors of the educational process is mediated by technical means. Accordingly, it is necessary to consider the use of technology, which also affects the quality of education. An individual's adoption and use of technology are determined by both external and internal factors. Delone and McLean (2003) proposed an information systems success (ISS)

model that includes six factors: System Quality, Information Quality, Service Quality, Intention to Use, User Satisfaction, and Individual Benefit.

A cursory analysis of the national publications in RSCI on learning through distance education technologies showed that most of the research is aimed at identifying and analyzing the positive aspects. The benefits of distance learning include autonomy, cost-effectiveness, lack of stress due to lifestyle changes, and the mediated nature of the interaction between a student and a teacher (Gatan et al., 2021; Kirby, 2021; Marchuk, 2013; Qarkaxhja et al., 2021; Serebrennikova, 2015; Tovar-Gálvez, 2021; Tugun et al., 2020; Usak et al., 2020; Zachariou et al., 2020). Some studies address the psychological aspects of distance education technology use among higher education students. These studies focus on parameters of dominant cognitive style (Kasatkina, 2010), the level of subjective control and self-regulation (Aismontas & Udin Aktkher, 2013), the peculiarities of perception and reconstruction of the image of the teacher by students of psychological and pedagogical specialties in the process of viewing video lecture fragments (Panferov et al., 2018), and the psychological status of higher education students in Covid-19 (Wang & Zhao, 2020; Wang et al., 2020). The transition to distance education revealed several significant challenges, the least of which is technical unpreparedness. The introduction of technological means into the educational system with which educational actors interact leads to the emergence of various phenomena of psychological nature: resistance to new technologies and activities, a change in communication style, confidence in interacting with technology, neuropsychic tension, and stress, etc. Unfortunately, as Zhuravlev and Nestik (2019) note, thinking about the future has tended to focus on technological issues of digitization, and very little research has been done on understanding the processes and changes that happen to a person (Nestik, 2018; Zhuravlev & Nestik, 2019). DeLone and McLean's (2003) information systems success model is one of the first explanatory models; it has been tested in various areas of human life: Enterprise systems, knowledge management systems, e-commerce, online stores, etc. (DeLone & McLean, 2003). The research results show that the use of the system and user satisfaction is directly related to the quality of the system itself and the information transmitted.

The Technology Acceptance Model by Davis (1989) has become widespread (TAM - Technology Acceptance Model), which was developed based on Fishbein and Ajzen's (1975) theory of reasoned action. This model makes it possible to predict the practical use of technologies, and numerous studies have confirmed its validity. Its aim is to explain and predict the adoption of information technology. It analyzes and explores the factors that influence the acceptance of particular information technology. The model includes six elements: perceived ease of use, perceived usefulness, attitudes towards technology, intent to use the technology, and actual use. The actual use of technology is determined primarily by variables such as ease of use and usefulness. The perceived ease of use of the technology is when a person does not have to make any additional effort when using the system. The perceived usefulness reflects one's opinion of whether the productivity and efficiency of activities are improved by the use of technology (Davis, 1989; Tkáčová et al., 2021).

Later, Davis' (1989) model was extended to include other variables such as perceived enjoyment (Davis et al., 1992; Ngo et al., 2021; Saade et al., 2008; Venkatesh, 2000), self-efficacy, people's assessment of their ability to perform a given task (Venkatesh et al., 2012). Later, playfulness was added to the TAM model. It is characterized by focusing on activities and sensory or cognitive curiosity and feeling pleasure (enjoyment) when finding what is happening interesting (Moon & Kim, 2001).

Another model widely used in the literature is TPACK (Technology, Pedagogy, and Content Knowledge). The TPACK framework divides target knowledge into three types: Content, Pedagogy, and Technology. The intertwining of these three areas results in four main domains: Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technology, Pedagogy, and Content Knowledge (TPACK).

What competencies we need is another question that arises in the context of the widespread use of distance education technologies. Wan et al. (2008) introduced the concept of virtual competence, which is the ability to make the best use of the virtual environment. The virtual competence framework includes the following components: virtual self-efficacy, virtual media competence, and virtual communication competence. Virtual self-efficacy is determined by the degree of confidence in using information and communication technologies to solve problems and also contributes to the willingness to make efforts to

overcome difficulties. The authors consider virtual media competencies as technical skills for performing in a virtual environment. The third component refers to the knowledge and skills in building social relationships in a virtual environment. Research has shown that experience in using information and communication technologies (e.g., searching for information, communicating) does not guarantee successful e-learning and user satisfaction. Students should build virtual competencies that determine their success in their studies.

The researchers note that the TAM model is commonly used in the banking and technology sectors. For successful implementation of technology in education, it is necessary to understand what factors are critical for effective e-learning and student satisfaction. The purpose of this study is to explore the psychological difficulties in the adoption of distance learning technologies in higher education during the 19th century.

## MATERIALS AND METHODS

This article presents the results of the analysis of the distance learning experience of university students and considers the main psychological difficulties that they face. The research is exploratory and aims to identify those areas that may be of interest in the future for a deeper study.

*Description of the study.* The study was conducted between April 2020 and April 2021. The transition to distance learning in our region (the Sakha Republic (Yakutia) took place on March 17, 2020, and by the time the study began, students had been studying remotely for three weeks.

*Participants:* A total of 86 undergraduate students from various specialties were the participants in this study. They were enrolled in various courses at the university. Among the participants, 60% of them were male, while the rest (40%) were female. All of them were higher education students at the university in Russia.

*Data Collection:* The unstructured interview, which is one of the qualitative methods, was used to explore the psychological difficulties of university students in adopting distance learning technologies. During the interviews, we asked students to tell in detail about their user experience, describing not only the learning process itself, but in general the entire learning context (what they do while listening to lectures, what is happening around at this moment, etc.). The unstructured approach was chosen to acquire rich information about the difficulties of adopting distance education technologies. This kind of data collection allowed researchers an opportunity to obtain much information about the experiences of the students and provided participants the freedom to explain the psychological difficulties that they may have faced during the use of distance learning technologies. In its nature, unstructured interviews are open-ended, while "*structured interviews are similar to surveys*" (Zhang & Wildemuth, 2009, p. 239). In addition, unstructured interviews are "*... a way to understand the complex behavior of people without imposing any a priori categorization, which might limit the field of inquiry.*" (Zhang & Wildemuth, 2009, p. 240). Hence, unstructured interviews can be accepted as one of the qualitative data collection tools (Moyle, 2002; Zhang & Wildemuth, 2009).

*Procedure:* In this study, researchers using Zoom and WhatsApp conducted the interviews. In most cases, excerpts from interviews have not been edited in terms of language use. In this work, we used terms such as UX design and computer science for a consistent understanding of these terms. We understand user experience as a set of effects experienced by the user as a result of interaction with a system or device, including perceived ease of use and usefulness, emotional impact during work, and memories that remain after interaction (Hartson & Pyla, 2012). The study of user experience will allow understanding of the difficulties that students experience when studying remotely.

*Data Analysis:* The data obtained from the interviews were analyzed by researchers. For the analyses, all researchers read the interviews. While reading the interviews, they took notes. Later, they determined codes and themes that were used in the data analysis. Then, two researchers individually analyzed the data separately from each other. After the analyses, two researchers compared and discussed their analyses to reach a consensus for the data analysis. Afterward, it was calculated agreement between the two researchers. Accordingly, a level of %89 agreement was found among researchers.

**Table 1.** The psychological difficulties of accepting distance educational technologies by students

No	Psychological Difficulties	Reasons
1	Lack of emotions in the process of communication	Reducing the completeness of the implemented communication tasks
2	Low technological efficiency of the introduction of e-learning technologies	Poor technical equipment, poor quality of the Internet
3	The psychological barriers	Subjective education, the experience of the subject of some complexity, unusualness, non-standard, contradictory situation
4	Weak digital competencies	The problem of personal preparedness for distance learning education

## RESULTS

Initially, let us turn to the analysis of those statements that affect various aspects of communication, since the entire learning process is, in fact, communication. This position is also confirmed by a large number of students' statements, which touch upon its various aspects (Table 1).

*Lack of emotions in the process of communication:* Perhaps the greatest concern, disappointment, and dissatisfaction of the respondents are associated precisely with communication issues in the broad sense. Students note a lack of emotions in the process of communication, which can be due to various reasons. Not all participants turn on their video during classes, the lack of feedback in the form of emotional reactions of the interlocutor causes discomfort ("sometimes the teacher or classmates do not turn on the camera and it's very strange as if I'm talking to myself, so you can go crazy", "when you answer to the question, it is not clear whether you are answering correctly, because often you don't know the correct answer, but you answer randomly"). In the digital space, there are tools and means for expressing emotions, perhaps they are not so diverse, but at the same time, they reflect the basic emotions (various stickers, emojis, gifs, slang interjections, and phrases), but their use has not yet become familiar to the educational process. Many studies carried out in the field of human-computer interaction (Hartson & Pyla, 2012) also confirm that non-basic emotions such as frustration, boredom, and confusion play an important role in scenarios of interaction in a virtual environment. Unfortunately, today we have a really limited number of tools that allow us to express our emotions and understand the emotions of the interlocutor in virtual communication. Although according to Wan et al. (2008), there are such options though we do not fully use them in the educational process.

Interestingly, when communicating with a teacher, students need to see the teacher's image, and not only the teacher's face but also his gestures, movements, postures (the effect of the teacher's full presence), which contributes to better perception and understanding of the educational material ("... I would like the teacher was like a blackboard so that you can see how he moves", "... the teacher sits completely motionless"). Research results show that the presence of a teacher in a video lecture increases the efficiency of mastering educational material (Lazarenko et al., 2018).

Interestingly, many respondents express a desire to see the faces of others but prefer not to show their faces. Many explained this by the fact that outwardly they were not ready for communication ("I am sitting in my homemade pajamas," "I didn't wash my head," "I don't want to see my face in the cell, it looks thicker"). The results of the study can be analyzed from different perspectives. For example, from the point of view of analyzing the phases of activity, it can be assumed that students don't dress up for online meetings, the phase of the pre-working state is not supported by actions that allow them to concentrate on work, respectively, an important stage of attunement to the upcoming activity is curtailed, which can affect the effectiveness of the activity. Another interesting aspect for further analysis is the phenomenon in which students choose not to show their faces. This is also evident in the fact that the most preferred service for students is Discord, where participants have the opportunity to communicate verbally and in writing, but their faces are hidden.

*Low technological efficiency of the introduction of e-learning technologies:* Feedback from teachers is extremely important for students ("... I don't like it because teachers give a lot of tasks and don't check it", "... some teachers give a lot of tasks and don't check it, and this is the most offensive"). Feedback from the teacher allows not only controls the process but also serves as a support in learning. In addition, high-quality feedback and teacher support can compensate for the low technological efficiency in the implementation of e-learning technologies, which is important against the background of insufficient technical equipment and Internet

connection. It is known that one of the main problems of online courses is the low percentage of course completion. Among the many reasons, lack of interactivity and a sense of isolation is recognized as the most significant.

Students' statements indicate that the familiar pedagogical communication in a virtual environment is changing, the students themselves feel it, according to one student: "I don't feel the learning process". Thus, we still have to master new ways and tools of communication through information and communication technologies.

The psychological barriers: Several difficulties are related to the implementation of pedagogical communication tasks. In terms of the completeness of communicative tasks (Zimnyaya, 1997), one can note their reduction; often communication is limited to some information on the course ("we sit stupidly and listen to the lecture," "talking head") and answers to questions ("at the seminar, we answer questions "). During online classes, tasks such as "motivation to action (verbal or non-verbal)" and "expression of attitude to the verbal or non-verbal action of a partner of pedagogical communication" are realized less often. This problem stems from the fact that at this stage distance learning is still copying "traditional" learning; the technology is used to automate the transfer of content (Wan et al., 2008). The authors emphasize that although technology can provide social interaction; these opportunities are not used in the educational process. Distance learning requires both the teacher and the student to master some methods, and tools for building interaction in a new environment, for example, using the functions "comments", "polls", "likes" and so on.

*Weak digital competencies:* Students when studying remotely in a virtual learning environment, most often do not have the opportunity to communicate with each other without being heard and seen by the teacher. Among our respondents, students who did not attend online classes preferred to study the educational material on their own ("... I do not use the ZOOM application, because the teacher drops the lecture in Moodle and I read the lecture myself"). Informal communication among students takes place outside the "walls" of the virtual classroom, mainly on social networks. Many students want to communicate with fellow students ("of course, I miss my classmates, I miss my normal life, I want to go to college normally, go out with friends, etc.", "I want to see my friends, just laugh with them"). It is known that the educational activity of full-time students is supported by several motives, among which communication, and social interaction occupy the key places. For many full-time students, it is social motives that are dominant in the motivation system.

## DISCUSSION

### Competencies of Students

Considering communication in educational activities, two aspects can be distinguished: communications related to the educational process, and communications between students on informal topics. This division is very conditional since these communications are closely intertwined with each other. The key role of communication in learning is emphasized in the Connectivism Learning Theory by Siemens (2018). According to the author, his proposed learning theory is more consistent with the digital world. Siemens considers it necessary to revise the concept of learning, taking into account modern theories of chaos, networks, complexity, and self-organization. In the context of the avalanche of knowledge and its rapid obsolescence, the Connectivism Theory emphasizes learning as practically meaningful knowledge that is generated and supported by the network of connections that we have: "We can no longer single-handedly acquire the experience and knowledge we need to act. We acquire the necessary competencies through interconnections" (Siemens, 2018). This was pointed out by our domestic researchers, for example, Lomov (1984) wrote that communication is "not the addition, not the imposition of activities one on top of the other developing in parallel ("symmetric"), but namely the interaction of subjects entering into it as partners" (Lomov, 1984), in the process of such communication, mutual enrichment occurs not only with knowledge but also with other meanings.

Referring to the material of our research, we can make some assumptions about the competencies of students. Siemens in his theory formulates the principles of connectivism, in his opinion, the ability to learn new things is more important than the amount of already acquired knowledge, the main skill is to recognize the connections between ideas, areas of knowledge, and concepts (Siemens, 2018). According to the students'

statements, it can be assumed that they do not always understand the connections between different disciplines (“I don’t want to do it because the subject is not interesting”, “useless material”). But when analyzing the nature of tasks for independent work, we find that they are mainly aimed at increasing the amount of information (read, outline, prepare an essay, etc.), fewer tasks are given for analysis, comparison, generalization, and in isolated cases tasks are interdisciplinary.

Distance learning, which was designed to provide new education opportunities, in the current situation leads to the emergence of many psychological barriers, which are understood as “subjective education, the experience of the subject of some complexity, unusualness, non-standard, contradictory situation” (Zimnyaya, 1997). The barriers that arise impede interpersonal communication, and they are accompanied by neuropsychic stress and negative emotions. Almost all respondents say that the number of tasks has increased during the period of distance learning (“they ask too much”, “there is more independent work”), the amount of literature that needs to be read and mastered on their own has increased (“some just give a list of things to read”). If the information overload has increased objectively, then there is a risk of mental overload, in addition, an excessively large amount of information leads to the activation of short-term memory, which means superficial mastering of the material, without its deep understanding and assimilation (Yakovlev & Litovchenko, 2007). If it is a subjective experience, it can arise from immersion in a new activity and mastering new actions. It is known that mental activity, an increased load on cognitive processes requires much more effort (Scholey et al., 2001).

### The Cognitive Side of Learning

Let’s consider another aspect that affects the cognitive side of learning, namely, the student’s perception of the electronic learning system. The main characteristics of the system, software product include usability, simplicity, and ease of use, usefulness, functionality, and emotional impact (Hartson & Pyla, 2012). All interviewed respondents used the Moodle system; therefore the presented characteristics refer to the same system. When analyzing the students’ user experiences, it can be noted that ease of use and convenience of work are important for them. Many respondents note a low degree of user-friendliness of the interface (“look for the right discipline every time”, “there are a lot of other disciplines that are not related to our field of study”, “the course that is needed may be at the end of the list”, “in the first year we there were of course problems, it was not clear what, where, where to click”). It can be assumed that the principle of material structuring offered by the Moodle system does not correspond to the users’ logic. As shown in the study (Al-Samarraie et al., 2013; Mohammadi, 2015), well-structured content helps to increase motivation, concentration, and interactivity of learning, which affects the metacognitive activity of students and makes it easier to understand the educational material.

Also, some rules are contributing to a better perception of the material: structure (it is easy to find what you need in the material already covered); fragmentation (the process of perception is discrete), assimilation of the next portion of information (Krylova et al., 2018).

The basis of any educational system is high-quality useful content that contributes to the development of competencies, and the achievement of educational objectives. At the same time, at the present stage, users make high demands on the educational platform’s design. Many respondents note the “dull”, and “boring interface” of the Moodle system, and the lack of opportunities for individual interface customization. A factor such as “perceived pleasure in using technology” is not supported. Perceived pleasure is related to whether the activity of using technology gives enjoyment to the person (Zulfiqar et al., 2019, 2021). When a person continues to engage with technology regardless of any performance outcomes, then perceived pleasure is revealed (Zulfiqar et al., 2019, 2021). Meanwhile, research suggests that pleasure in the process of using technology in most cases correlates with intending to learn (Hsu & Lin, 2008; Zulfiqar et al., 2019, 2021). In addition, when the variable “pleasure” is included in the Davis model, it appears that it influences the use of technology more than the variable “ease-of-use” (Teo & Noyes, 2011; Zulfiqar et al., 2019, 2021).

The situation of distance learning has raised the problem of personal preparedness during COVID-19 (Naji et al., 2020). Researchers are unanimous in the opinion that the distance learning system requires a high level of development of personal qualities from a student: motivation, advanced planning skills, self-organization, and self-control. Foreign researchers emphasize that e-learning involves the widespread use of an independent method of self-directed learning (SDL) (Rovai, 2004). Based on the theoretical premises of the

Constructivism Philosophy, e-learning is recognized as an active information process, since knowledge generation is carried out through individual experience and interaction with the environment. Unlike objectivism, students are seen as active creators and creators of information.

Most of the respondents in our study are indicated to have a passive learning style, expecting clear instructions; it is quite difficult for students to readjust. Most of the surveyed students note procrastination (“yes, all the time you think that you need to do the tasks, but for some reason, it seems that I’ll do it later, and then I’m reluctant to do it, and the deadlines for completing the task have passed”, “the tasks are not interesting, there is always something more interesting”), inability to organize their work (“I don’t know how to do everything, they ask so much”, “when they studied, it was all clear: I came, unlearned, but now everything was somehow confused”).

## CONCLUSION

Most of the respondents in our study indicated that the use of distance learning technologies would help reduce stress load, since students have the opportunity to choose a convenient learning schedule for themselves, adjusting it to the rhythm of their own life. In addition, with distance learning, communication is mediated, which increases objectivity during verification, the absence of criticism, and makes it possible to correct errors, and therefore reduce anxiety. Similarly, other technological applications such as mobile learning (Naciri et al., 2020), smartphone applications (Tawafak et al., 2021), virtual laboratory (Radhamani et al., 2021), remote laboratories (Abumalloh et al., 2021) will help students learning to overcome the difficulties of adopting distance education during the COVID-19 pandemic.

Thus, the analysis of the exploratory research results allows us to conclude that at the moment we are faced with the need not only and not so much a technical transition, but mainly to change the goals of education, tools, and results. From the point of view of students’ acceptance of technologies, we can say that they cause them some difficulties associated with cognitive, emotional aspects, and interaction in a virtual environment. Learning creates anxiety and dissatisfaction. According to the TAM model, none of the components is satisfactory. Technologies are not perceived as easy to use, the assessment of the perceived usefulness of distance learning technologies is low, and students are rather skeptical about them.

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