

# Experience of Distance Learning Under Emergency Conditions of the COVID-19 pandemic

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**Abstract :** Actions to organize learning under the conditions of coronavirus pandemic (COVID-19) are currently being taken worldwide. In most countries, learning institutions are fully or partially closed, while all students are adopting distance learning. Closure of universities and emergency adoption of distance learning are related to obvious issues mainly caused by insufficient equipment and no or poor preparedness of teachers to work in new conditions. The current level of hardware and software development, limited opportunities of the Internet, and the level of distance learning organization fail to ensure high-quality education that would be comparable to traditional offline classroom education. These and other issues challenge the education system in a crisis situation. This study intends to analyze the modern situation and measures taken to arrange distance learning in the conditions of leaving conventional classroom learning for distance learning. This gave an insight on preparedness of students, university teachers to ensure continuous education in the time of crisis. The obtained data revealed primary issues of adopting distance learning

and advantages of online studies, the need to develop and implement a new model of learning process that can be called combined. Traditionally, this model combines full-time attendance using online courses with synchronous distance learning. The article describes the revealed drawbacks of MS Teams in the learning process and solutions on how to eliminate them.

**Keywords :** online learning - COVID-19 pandemic; higher education; adopting distance learning.

## 1. Introduction

A rapid adoption of distance learning in all learning facilities has become a global challenge to the modern education system. There is no doubt that the field of higher education is one of those mostly affected by the pandemic. It should be said that distance learning is not an absolutely new form of learning since it has been used in higher education before the pandemic, but as an auxiliary method (Glukhikh & Norina 2015; Pukharenskiy & Norin 2016). However, during the quarantine, this form revealed multiple issues related to how the learning process is organized (Effects of COVID-19 pandemic on higher education and master courses 2020).

On the one hand, a rapid adoption of online learning made skeptics plunge into new opportunities and find how rich and convenient modern technology

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is, but, on the other hand, it disclosed weaknesses and imperfections in the technology some of which were uncovered in a wide-scale online learning only (Fominykh 2020). First of all, these issues are related to how the Internet functions, unreliable operation of modern equipment supporting distance learning, unreliable operation of software, and how teachers explore advanced platforms that could be potentially used to organize learning in accordance with the Russian Federal State Learning Standards (FSES). Students also face challenges during studies in electronic informational learning environments. It should be understood that it is not sufficient to digitize some course materials and the distance format is not part-time education. Here, we see an issue of remote management over building competencies in students in accordance with FSES (Tsener & Oshkina 2020; Seale 2020; Covid-19: Higher Education challenges and responses 2020; Larionova 2020).

We should admit that the respective information technology has emerged, which is a must, but requires technical, methodological, and organizational improvement (Altbakh & Hans de Vit 2020). A balance must be found between conventional classroom studies and online learning, and new technologies must be developed, which allow keeping full-scale communication between participants of the learning process. Further advancement of education, its technical, methodological, and organizational support will show whether such an abrupt adoption of online learning will become a breakthrough, a flight or will cause decay of education and longing for its older forms.

Such an adoption was technologically, but not methodologically complete. The learning processes have been transferred to a different plan almost without change since there has been no time for them: Zoom, Teams and Skype lectures are almost the same both in content and form (Dikova 2020). Nevertheless, it seems apparent that online learning tools must feature more opportunities and consider the cognitive area, features of attention, motivation, and psychological condition of students.

## 2. Covid19 Pandemic. International Context

Universities in 130 countries have taken part in an unprecedented experiment – closure of campuses and adoption of distance learning (Karpenro O.M. (2020). Thanks to the development of online learning and digital technology, most higher education systems had

an experience and infrastructure in 2020 that helped them keep the learning process organized. These systems experienced similar processes in the countries with various levels of economic development, area, and political conditions (Analytical report. Stress-test lessons: universities during and after pandemic 2020; Education responses to covid-19: embracing digital learning and online collaboration 2020; AI-powered COVID-19 watch 2020; Kapasia et al 2020; Nguyen et al 2020; Manzoor 2020).

In most countries:

- campuses were rapidly closed and mobility of students and teachers was restricted;
- IT infrastructure was adjusted to organize distance learning;
- regulatory framework was developed at the national level to adopt remote work (especially in terms of entrance and graduation examination);
- channels of informational support were arranged for students and teachers;
- specific formats of psychological support were provided;
- measures were taken to support higher education institutions financially;
- all national systems of higher education faced the challenge of income reduction and that was especially prominent in countries with a high share of extra-budget funding (including universities with a high share of foreign students).

While the risk to financial stability (that may lead to closure of a significant number of universities) was a major risk for Western learning systems (Onder 2020; Vedder 2020; Maloney & Kim 2020), the primary challenge for many developing countries is an increased growth of inequality of access to education caused by infrastructure and economic difficulties that students face and with insufficient methodological training of most teachers (Huang et al 2020). Issues of ensuring proper quality of education have also appeared to be pressing for most countries. More than 60% of universities all over the world claim that they could implement online courses in

response to the pandemic, but in reality, no more than one third of all universities managed to master this format (Martin & Furiv 2020). All countries face challenges in organizing distance learning for multiple engineering and medical professions, in the field of culture, art, etc.

There are differences in forms and features of adopting distance learning in various countries. As the expert interview with UNESCO (United Nations Educational, Scientific and Cultural Organization) specialists (COVID-19 Impact on Education 2020) and Organization for Economic Cooperation and Development (OECD) (Key country policy responses 2020; Learning remotely when schools close 2020) shows, the Russia has the following specific features (Analytical report. Stress-test lessons: universities during and after pandemic 2020):

- rapid adoption of distance learning by one of most massive systems of higher education in the world – 450 universities – in two weeks. In other large countries, universities adopted distance learning by decision of local authorities;
- attention to extra-curriculum student activities and organization of volunteering;
- organization of special measures to protect employees older than 65 against possible infection;
- involving leading universities in development of regulatory documents and promotion of methodological solutions for the entire system;
- from the early days, considering issues of job loss by students and stimulation of students' employment in universities.

### **3. Russian Higher Education Under the New Conditions of Learning, Working and Living**

The unique situation related to the COVID-19 pandemic can be undoubtedly deemed a natural experiment. An unexpected invaluable experience that we have as a result of a forced adoption of distance learning shall be studied. Implementing remote technologies in the field of education under the coronavirus conditions was primarily based on existing technologies of video-conferences, computer equipment being owned by students and teachers, which would allow using those technologies, and

having enough skills to use those technologies (Volchik & Shirayev 2020).

Under the said conditions, organizational mechanisms of learning activity have changed. Remote management is related to efficient coordination. This issue is driven by a multitude of communication means used for management. As a rule, phone communication (calls and SMS), messengers (like WhatsApp), emails (corporate and personal), messages in Microsoft Teams, Zoom, MOODLE, etc. are used for communication. The same communication channels transmit information not related to learning activity management. In this situation, attention of teachers is dispersed and disoriented (Covid-19: Higher Education challenges and responses 2020).

Many studies (Tsener & Oshkina 2020; Blinov et al 2020; Gorlushkina & Fillipov 2020; Skrypnikova 2020) consider increased labor expenses and loss of direct contact with students as the primary disadvantages of digitization. The authors have personally experienced a multiply increased paper flow. Distance learning that had always been shaped as a means to reduce time for organization of a learning process proved to be more time-consuming in practice. A constant need to invent means to solve issues that previously seemed to be simple, such as obtaining signatures for practice reports, issuing examination sheets, and eliminating technical shortcomings takes too much time.

The practice under the pandemic conditions showed that development of digital technologies creates an illusion of saving time in terms of organizational communications. In reality, a relative simplicity and accessibility of electronic forms related to bureaucratic regulation (Volchik & Maslyukova 2018) lead to a rapid increase in reporting, which inevitably takes time that could be used to advance the primary learning and scientific activity.

The issue of expanding bureaucratization in the field of education had specific manifestations during the struggle with coronavirus infection. Due to no opportunity of interaction between teachers and students, with student record books still requiring to be filled in by hand and thesis and practice reports requiring collection and retention, there is a dilemma about how bureaucratic rules can be fulfilled in terms of processing these documents during the lockdown. It is notable that processing hard copies of those

documents is still a must (Volchik & Shirayayev 2020).

While online work was previously undertaken for small groups of part-time students, today full-time students have also adopted distance learning and they are required to perform better during classes. The agenda now includes the question whether it is possible to keep the quality of education should distance learning be adopted in full. The issue of education quality may have various solutions. The education quality may be both improved or reduced as a result of adopting distance learning. On the one hand, distance learning can help many students to take part in classes. Those who can't attend the class for some reasons may take part in a video-conference. On the other hand, distance learning prevents from transferring some part of implicit knowledge (Volchik & Maslyukova 2018; Volchik & Maslyukova 2019). New opportunities for invisible slacking off classes appear.

Those practices that will be successfully reproduced under the conditions of coronavirus struggle or new practice that will be formed under those conditions will most likely remain after the crisis period is over. For example, many students and teachers form habits associated with the use of remote technologies and perhaps they will change their preferences. This manifested itself within a short period of time (September-October 2020) during classroom learning. Nevertheless, students did not come to personal consultations and sent their papers via e-mail, Teams, MOODLE. Quitting distance learning and getting used to regular studies requires some expenses. Therefore, if it is possible to retain some elements of distance learning in some cases, participants of the learning process will do it. A similar effect can be seen for other practices formed in the conditions of coronavirus struggle (Lomovtseva & Zarechneva 2020).

Distance learning certainly have advantages towards which the authors (School graduates and students told about distance learning 2020; Aleshkovskiy et al 2020; Savitskaya 2020) tried to find attitude of students. As the respondent said, a giant advantage is a comfortable atmosphere and flexibility of the learning process expressed in an ability to freely and independently plan classes and studies, individual work during the course, e.g., an ability to maneuver and adapt the curriculum to your own timetable and rhythm of life.

Development of high-quality products of online learning requires significant time expenses and competences that we lack now, but in the future this issue can be successfully solved. Now we need to develop and launch tools of learning analytics that will help defining weaknesses of online courses, learning modules and programs. It is especially valuable to analyze those forms of learning and individual courses that have a high rating among students (Dikova 2020).

Learning analytics should also consider the opinion of teachers. It is important to be able to get consultations, organize experience exchange, share impressions since now we are devoid of such opportunity due to high intensity of work. A deep analysis of the learning process in the current conditions of spontaneity, ambiguousness and instability will give us a clearer vision of how to solve such issues in the future, what competences should be developed and how to promptly and flexible respond to challenges of time (Volchik & Shirayayev 2020).

Currently, there is no information concerning the quality of distance learning. Efficiency of distance learning can be measured in several years. The new form of education has both opportunities and restrictions (Larionova 2020). When assessing efficiency of a new learning technology or an learning model, it seems very tempting to compare the results of education obtained when using this technology with those in the conventional model of full-time learning. However, this comparative analysis gives no substantiated statistically relevant conclusions since it requires (Distance learning in extreme conditions 2020):

- strict experimental design;
- content identical in scope and differing in format;
- similar testing materials and conditions of final assessment;
- a sufficiently large sample randomly formed for each model (technology) of training;
- preventing influence on experimental results from external factors reducing the experiment validity.

Moreover, this analysis defines efficiency as performance of students and does not consider other success factors. Success can be measured based on

interests of various participants in the learning process. For teachers, that is the academic progress of students, and for students, apart from performance, motivation and involvement into the learning process play a huge role and directly affect their achievements. For university administration, values like the percentage of students completing a training course, reducing workload of teachers and their improved labor productivity, and market capture and volume of raised extra-budgetary funds are important. For the founder (the Ministry of Science and Higher Education), accent shifts towards the quality of education, sufficiency of human resources and reliability of IT infrastructure, global competitiveness of the Russian education, and fulfilling values of national and federal projects.

Efficiency evaluation of online learning and use of distance learning technology can be performed through the prism of the target values, but such an evaluation is appropriate in the conditions of systematic adoption of a new model of learning process. Under extreme conditions of rapid re-formatting of learning process and limited internal and external resources, quite different evaluation criteria become relevant. They can be divided into 4 types: evaluation of background (pre-requisites) of changes, evaluation of feasibility and economic efficiency of changes, evaluation of processes of changes and outcomes (products), both direct and secondary.

In this connection, to evaluate a current forced adoption of distance learning, universities will have to answer the following questions:

- what factors (social, institutional, administrative) defined preparedness of universities to distance learning, attitude of participants to changes and affects efficiency of these changes?
- are internal and external resources sufficient for such an adoption? In particular, is the development level of IT infrastructure sufficient for technical support of changes? Do employees and teachers have necessary competencies to perform assigned tasks?
- what stages of the adoption process were most complicated for participants? What organizational mechanisms failed?
- what are results of distance learning adoption for

students, teachers, auxiliary personnel? What is the reason for failure to achieve goals and negative feedback from participants? What issues must be solved to improve results?

This evaluation is more intended to analyze pre-requisites, demands, and processes than outcomes. In this case, efficiency is defined as the ratio between outcomes and resources spent, considering the urgency of assigned tasks. Finally, it is now more important to draw conclusions from this global experiment and organize systematic correction of errors to avoid them in the future.

The issue of comparing online and classical classroom learning has been urgent for the last several decades. Scientists tried many times to find the best format. As a result, hundreds of studies can be found who assert that online learning is more efficient than classical one and the same number of researchers that defend the contrary point.

Today many experts come to the single conclusion that it is incorrect to compare online and classroom learning (Surry & Ensminger 2001; Cherepanova 2020). Both formats have their undeniable advantages and efficiency will be different for each specific case. The result depends on the background, subject, goals of learning, personal characteristics of students, quality of implementation of the study product and an indefinite number of more obvious factors.

The market of online education is quite diverse: there are wide-scale open online courses (like Coursera, EdX, Udacity, Udemy), universal learning platforms, various learning management systems (LMS), mobile applications and computer games for learning, tools for video conferences, virtual lessons with teachers, etc. It is more important to understand how to properly combine formats and tools to achieve the best result. It is not accidental that, after the first wave of pandemic, most leading universities of the world declared that they planned to implement the mixed learning style with classical classroom lessons being supplemented by an online platform (Analytical report. Stress-test lessons: universities during and after pandemic 2020). This decision is caused by the need to prepare to next waves of the virus and by some objective reasons: according to the poll taken in the US, 81% of students believe that using auxiliary digital tools significantly improves their performance at the university (Impressive E-Learning Statistics for 2020, 2020).

The Ministry of Education and Science of Russia and the Institute of Social Analysis and Prediction undertook a large-scale poll of teachers at universities concerning development of online environment under the conditions of coronavirus pandemic (Teachers commented upon forced adoption of online learning (2020). The total of 58,612 respondents took part in the wide-scale research of teachers' attitude to distance learning under the conditions when their professional activity and organization of personal life have been changed greatly. After selection, 33,987 teachers were polled, or about 15% of the overall general population of teachers.

The research showed that teachers do not psychologically accept such an abrupt gap with conventional classroom learning. Such a skeptical attitude is driven by specifics of subjects taught (for example, technical and experimental ones) and conservative ideas about the nature of learning. Formally, teachers are loyal towards the situation and accept adoption of distance learning. But the degree of internal latent disapproval of distance learning is strong for all professional disciplines irrespective of gender, age, or social and professional status of teachers.

The poll found two positive social characteristics of professional community of university teachers: acceptance of state policy of combating the coronavirus and skills needed to operate in the online environment as well as computer competence (Analytical report. Stress-test lessons: universities during and after pandemic 2020):

- 77% of respondents called the situation serious or more likely serious; 91% agree that the measures taken by the university are necessary and sufficient;
- 83% of respondents are almost all the time present in the online environment using mobile and stationary devices; 75% of respondents evaluate their competence in computer science as generally higher than that of their colleagues.

The poll data indicates that teachers are competent in working online and most of them have learned to use the online environment. Along with that, adoption of distance learning, a break of a usual lifestyle and normal daily routine that distributes work and leisure in both time and space have caused stress and resulted in nonacceptance of distance learning (Teachers

commented upon forced adoption of online learning 2020):

- 66% of teachers indicate that they don't like working from home;
- 34% of teachers have no place at home for comfortable work;
- 85.7% of teachers feel that they have less free time and believe that their workload has increased;
- 87.8% of teachers think that it is better to give lessons in classroom.

Acceptance of distance learning are mainly influenced by relations in family and personal preferences of working from home. In this manner, such an abrupt adoption of distance learning causes nonacceptance (or discontent) of teachers that is mainly associated not with the level of qualification but with disruption of the usual lifestyle and the need to re-consider one's workplace and search for individual approaches to learning.

Those teachers who have a liberal opinion towards education (more freedom to teachers and students in selecting learning formats) and representative of military subjects who are more disciplined and accustomed to follow orders are more adapted to challenges of distance learning. It is not improbable that such reaction is related to a rapid and almost instantaneous adoption of unusual forms of work when most teachers had no necessary online skills and had to take a zero cycle in mastering them. It is possible that the situation may change when such skills are received and necessary infrastructure is developed.

The teachers have three primary requests:

- physical items (computer equipment and software);
- communication (environment for communication necessary and sufficient to support distance learning, inclusion into the community and maintenance of a high level of learning);
- organization (reducing bureaucratic pressure and providing more freedom in selecting means and methods of learning).

36.5% of respondents agree and 46.1% disagree that the education tends to individualization and adaptation to each student. 41.5% of respondents agree and 42.8% disagree that the teacher's freedom in selecting means and methods of learning rises. Those who have a positive attitude to adoption of distance learning and hope that education quality will be improved (Teachers commented upon forced adoption of online learning 2020) dominate among those who see the future of higher education as a sphere of free and individualized forms of knowledge transfer.

The following are called as the primary menaces related to the lack of opportunity to liberalize education and adopt distance learning (Analytical report. Stress-test lessons: universities during and after pandemic 2020):

- 1) reduced motivation of students to learning;
- 2) insufficient skills in students to maintain discipline and eagerness in distant learning;
- 3) emotional breakdowns in students and teachers;
- 4) growth of teachers' workload;
- 5) no individual approach in the education system, impersonality;
- 6) no ability to control the level of knowledge;
- 7) restriction of distance learning in some areas (first of all, technical and mathematical ones)
- 8) formalization of learning process, tendency towards templates and unified solutions.

According to the research (Storm of first weeks: how higher education made a step to the reality of pandemic 2020):

- 96.2% of respondents personally adopted distance learning.
- 87.8% of teachers think that it is better to have lessons in classroom.
- 67.8% of teachers do not agree that most lectures and seminars will be online in a year.

- 53.2% of teachers undertook courses in distance learning during the last month.

A profound analysis of this data showed that, in general, teachers managed to mobilize to working under new conditions but the issue of the first weeks was insufficient awareness of working conditions and available resources. Key deficiency was not technological but methodological one, related to the fact that teachers do not have modern methodological means to organize distance learning. The second poll conducted in two months showed that 36% of teachers improved necessary competences during the period to have classes online by undertaking respective refresher courses.

Teachers who worked synchronously noted a difficulty to keep attention and involvement of students as a specific methodological challenge. 65% of teachers believe that lectures in distance format will unlikely allow for control over involvement of students into the learning process. Many customary formats were less efficient than in classroom learning. For example, more than 70% are afraid that the practice of unfair behavior among students during exams will rise, which is more difficult to control in distance learning (Teachers of Russian universities on development of online-environment in pandemic conditions 2020). Teachers of subjects that require laboratory or special equipment found themselves in an awkward situation. In most cases, they had no methodological or technological support at all.

In response to challenges of adopting the new format, the support system grew quite rapidly. Almost all universities provided methodological recommendations to their teachers. But only 60% of universities created special websites or sections at official websites to inform and support teachers. Universities launched programs of methodological support for teachers (using in-house or external resources). Many teachers used respective websites of leading universities. Most active teachers shared their experience and resources through social media and conducted special webinars. It is also important to note infrastructure support of teachers – at the time of adopting distance learning, about 19% of teaching staff had issues with the equipment required for work, while the share of such teachers fell down to 13% by the end of May (Covid-19: Higher Education challenges and responses 2020).

For some teachers, distance learning appeared to be more comfortable – in both planning of personal working time and in terms of learning organization. Moreover, 15% of teachers believe that the education quality has become much better. However, almost 60% doubt the quality of online learning and do not plan to continue its active use after the self-isolation regime ends. In another research, most teachers agree that this acute situation helped them master new tools and practices of online learning (Savitskaya 2020).

According to the Ministry of Science and Higher Education of the Russian Federation, teachers at Russian universities, during a stress test, were divided into four groups (Analytical report. Stress-test lessons: universities during and after pandemic 2020):

1. Teachers of subjects that require a significant scope of practical and laboratory work – for the most part, they had no serious substitution to their teaching methods. They were engaged in methodological and organizational work and helped other teachers – those were averagely 5% of the total number of teachers. This group was totally against using distance learning and new technologies in the future.
2. Teachers who had actively used digital technologies (including online courses and resources) before the pandemic. They managed to quickly expand the use of their usual tools of communication and create digital resources and learning management systems – their share was about 25% (60% at leading universities). In general, this group supports expansion of distance learning and believes that education quality in certain online courses can be comparable with education quality in classroom learning.
3. Teachers familiar with digital technologies (including beyond their professional activity), Internet search, and email communication have quickly mastered new tools, including synchronous learning, but that required substantial effort – those were about 40% (50% at leading universities). This group got tired of increased scope of work and the need to master new technologies quickly. Generally, representatives of this group do not support substantial expansion of distance learning (including the use of leading platforms of open education), but in some cases they see opportunities to use communication technology, learning process management

systems, and additional digital learning courses.

4. Teachers who failed to explore new tools of learning organization, collective work and expanded use of digital resources have, in fact, adopted the part-time learning style sending assignments and recommendations to students – their share is 5% to 30% depending on the university. For those teachers, the experience of adoption was traumatic and very complicated. They do not believe in efficiency of distance learning or their ability to master new learning technologies.

In this manner, most teachers have various negative attitudes to online learning that almost have changed during the period of distance learning. This is associated with the following issues:

- labor intensity, need to increase methodological load and intensity of learning – only 12% of teachers believe that distance learning did not make their work more labor intensive.
- not being ready for efficient use of digital technology – more than 60% of teachers noted that even by the end of the distance learning period they had no sufficient competencies in the use of university learning management systems and third-party digital services, support and assistance of students using messengers, social media, collective work services to work with documents, etc. Even more teachers show methodological deficiencies of designing lessons that deal with involvement of students into activity during online classes, attention management, organization of productive feedback, mastering modern methods of online assessment, and providing intermediate and final assessment.
- distance learning is perceived as total opposition to the conventional method based on the black and white principle. In case of rigid comparison, almost 90% of teachers prefer conventional format in terms of quality of education and 85% believe that that conventional format is more convenient for them.

Along with that, the share of teachers who see new opportunities in digital technologies to improve availability of high-quality education have risen from 30% to 70% during the period of distance learning (Analytical report. Stress-test lessons: universities

during and after pandemic 2020). For example, 41.2% of teachers believe that the freedom of teachers in selecting means and methods of learning will expand in the nearest future (Olkhovaya & Poyarkova 2020).

#### 4. Methods

All publicly available sources of information describe the research results of COVID-19 effects on educational practice at Russian universities undertaken in spring 2020 during the first wave of the pandemic. There are no research results for fall 2020 – spring 2021 in available publications. Therefore, the authors have studied the effects of COVID-19 in the educational process as a case study of a single university, the Saint Petersburg State University of Architecture and Civil Engineering (SPSUACE), by researching students' opinions collected electronically under set conditions. The research covered 289 students in total. The total number of students is 13,383. The first stage (April 2020) involved 126 students while 163 students took part in the second stage (March 2021). Randomly selected second, third and fourth-year Bachelor's degree students and second-year Master's degree students took part in the polling. For the first stage of research, email was used as the way to communicate, while Microsoft Teams was used for the second stage. Total 126 questionnaires were sent to the participants, and 114 questionnaires with answers were received in the first case, while 163 questionnaires were sent to the participants, and 121 questionnaires with answers were received in the second case. The students were asked to answer questions concerning distance learning they were currently engaged with.

To level off the shift upon the year of study, course-weighted data was used in processing of the data received. In terms of ethics, all study participants received the detailed information concerning the research conditions like goal, data confidentiality, voluntary participation, and having a right to quit at any time.

#### 5. Results and Discussion

##### A. Students under the Conditions of Unexpected Adoption of Distance Learning

Distance learning has suddenly become a reality for millions of Russian students starting with the second half of March 2020. The digital competence of the students was almost out of question. But the issue

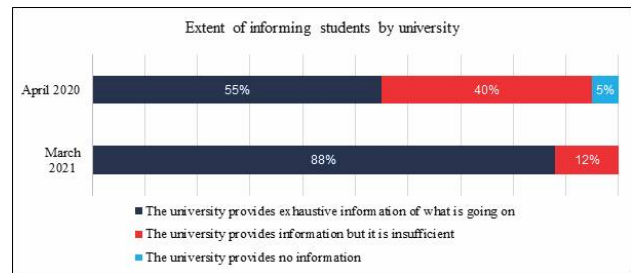


Fig. 1 : Extent of information provided to the students by their university

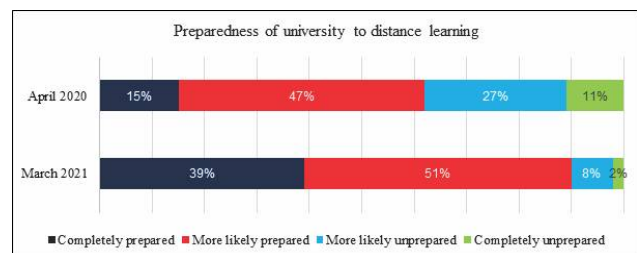


Fig. 2 : Students' opinion of university being prepared for distance learning

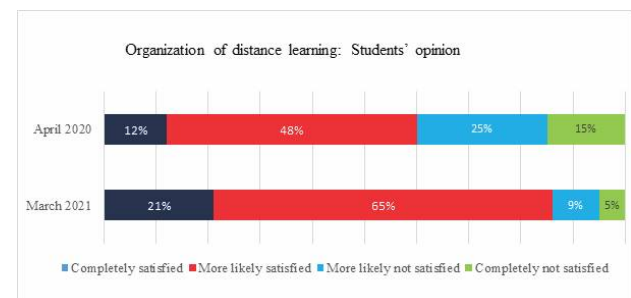


Fig. 3 : Satisfaction by organization of distance learning at the university

of informing students of new rules and communication tools (Storm of first weeks: how higher education made a step to the reality of pandemic 2020) appeared to be pressing. About 5% of universities had no system of electronic communication with students. In such universities, students got 'lost' and had to be contacted by phone, through their coursemates and families. In most other universities, students were not sufficiently informed of the new curriculum and new requirements as well.

The polling results of the SPSUACE students in April 2020 showed that only 55% (SD = 6) of respondents were fully satisfied with the extent of information provided by the university. During April 2020-March 2021, the situation around providing students with necessary data regarding the current

conditions and changes in terms of distance learning was improved and only 12% (SD = 4) of respondents considered the data insufficient (Fig. 1).

More than a third (38%) of respondents claimed that their university and teachers were completely (11%) or more likely not prepared to adopting distance learning (Fig. 2). The share of those who were not satisfied by organization of distance learning in their universities is 40% (Fig. 3). In March, these values fell down to 10% and 14%, respectively.

Most respondents (95%, SD = 5) note that, regarding all or some subjects, teachers sent them lecture materials for individual study and gave specific assignments. Almost 10% (SD = 3) of responders said that teachers started to deliver classes online using video communication equipment. More than a half (53%, SD = 7) report that all or some teachers delivered their classes in the university's LMS environment.

Students find video conferences (webinars) the most convenient method of communicating with their teacher, when they can communicate via monitor screen and, if necessary, ask questions and receive prompt answers. The format of video conferences reflects the full-time learning to the maximum extent with the only difference that teachers are on the other side of the screen. As many as 27% (SD = 6) of the polled students note that teachers of some subjects provided literature for independent studies only.

According to the respondents, despite adoption of distance learning, teachers remain available for communication concerning the subject. Only 5% (SD = 2) of students note that most teachers were not available. By March 2021, the situation has improved by nearly all the parameters; 99% (SD = 1) of all classes for all subjects were delivered using Microsoft Teams and video communication equipment. This became possible thanks to Microsoft Teams training courses provided by a certified Microsoft coach and organized by the university management.

But problems remained – most respondents (65%, SD = 4 – April 2020/75%, SD = 7 - March 2021) believe that their studies have become less efficient after switching to distance learning (Fig. 4). Most students (58%, SD = 9/32%, SD=11) started to postpone fulfillment of their assignments more frequently. Despite all difficulties related to the sudden adoption of online studies, 32% (SD=5)/23%

(SD = 6) of students replied that they like distance learning more than classroom learning.

It is symbolic that less than 10% (SD = 2) of respondents indicate no necessary technical skills and competencies in organizing their study online. This means that the current generation of young people is rather adapted and integrated into the digital learning space. They feel confident in the digital environment and experience no significant discomfort due to the necessity to technically arrange their learning process. In this manner, they significantly differ from their teachers who see a serious and even stressful problem in the necessity to quickly master new technical skills, software and resources as well as the technical component of working in the digital environment.

It should be noted that, despite good knowledge of digital technology, only 14% of students say that they find the situation completely fine. Perhaps, those who are completely content with the online format would be more, if not for a slight problem. One-tenth of all students had no necessary equipment like tablets, laptops and WiFi routers at home. Some respondents (21%, SD = 6/18%, SD = 8) believe that it is easier to send questions to the teacher online. As many as 55% (SD = 8) / 49% (SD = 11) of responders now have more time to sleep, 36% (SD = 12/32% (SD = 9) are less tired from their studies. Students distinguish the following advantages of online learning. Online format simplifies catching up the missed classes and re-passing of previously failed tests related to practical and laboratory activities and lectures. In this case, students feel more convenient to log in to the platform and watch a video of a lecture or class and fulfill assigned tasks independently.

Now 99% of respondents have Internet access at home while 90% (SD = 3) of respondents have their own PC or laptop; 84% (SD = 9) / 87% (SD = 11) note that equipment available to them complies or more likely complies with functionality requirements for learning; 51% (SD = 8)/91% (SD = 9) have access to all software necessary for learning (Fig. 5).

This indicator falls down to 70% in the group of students with an extremely low income (9% of the sample); almost one-third of the students of low-income groups have no sufficient functional equipment. Those who face this problem cannot buy new equipment due to financial limitations. Three quarters of respondents noted that they face various challenges (Fig. 6). Most common issues of students

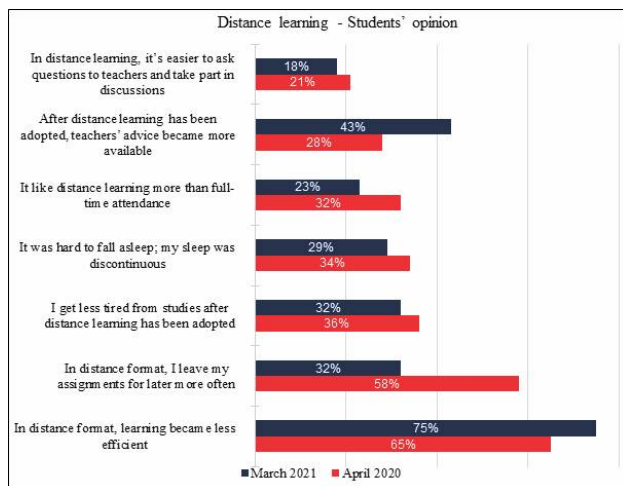


Fig. 4. Feedback on distance learning

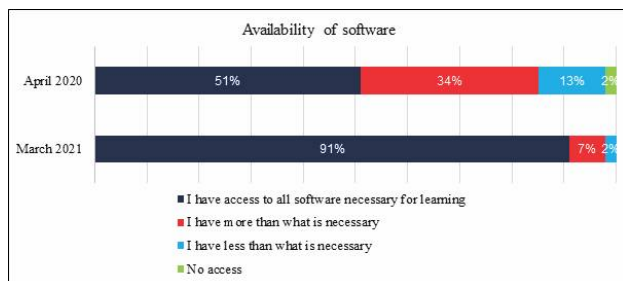


Fig. 5 : Software availability for students

are lack of communication with groupmates (43% (SD = 6) - April 2020 / 35% (SD = 9) - March 2021, lack of in-person discussions with teachers (33%, SD = 9 / 64%, SD = 7), technical issues of various kind, and Internet access failures (34%, SD = 12 / 75%, SD = 8). By March 2021, the number of people dissatisfied with unstable Internet connection associated with increased online loads had grown. In April 2020, the distant learning was organized on MOODLE. In March 2021, all classes were set up in MS Teams that had higher requirements for the speed of Internet connection.

It should be noted that, in March 2021, students reported that there were not enough personal discussions with teachers more often than in the previous year, even though MS Teams has more communication functions than MOODLE. In April 2020, it was only a month since the beginning of distance learning, and students had fresh memories of personal discussions and contact with their teachers. At that time, everybody hoped that the pandemic would end soon and life would turn back to normal. For this reason, lack of communication with teachers was not acute like in the year that followed. In March

2021, students grew tired from distance learning. They had an acute need to communicate with teachers.

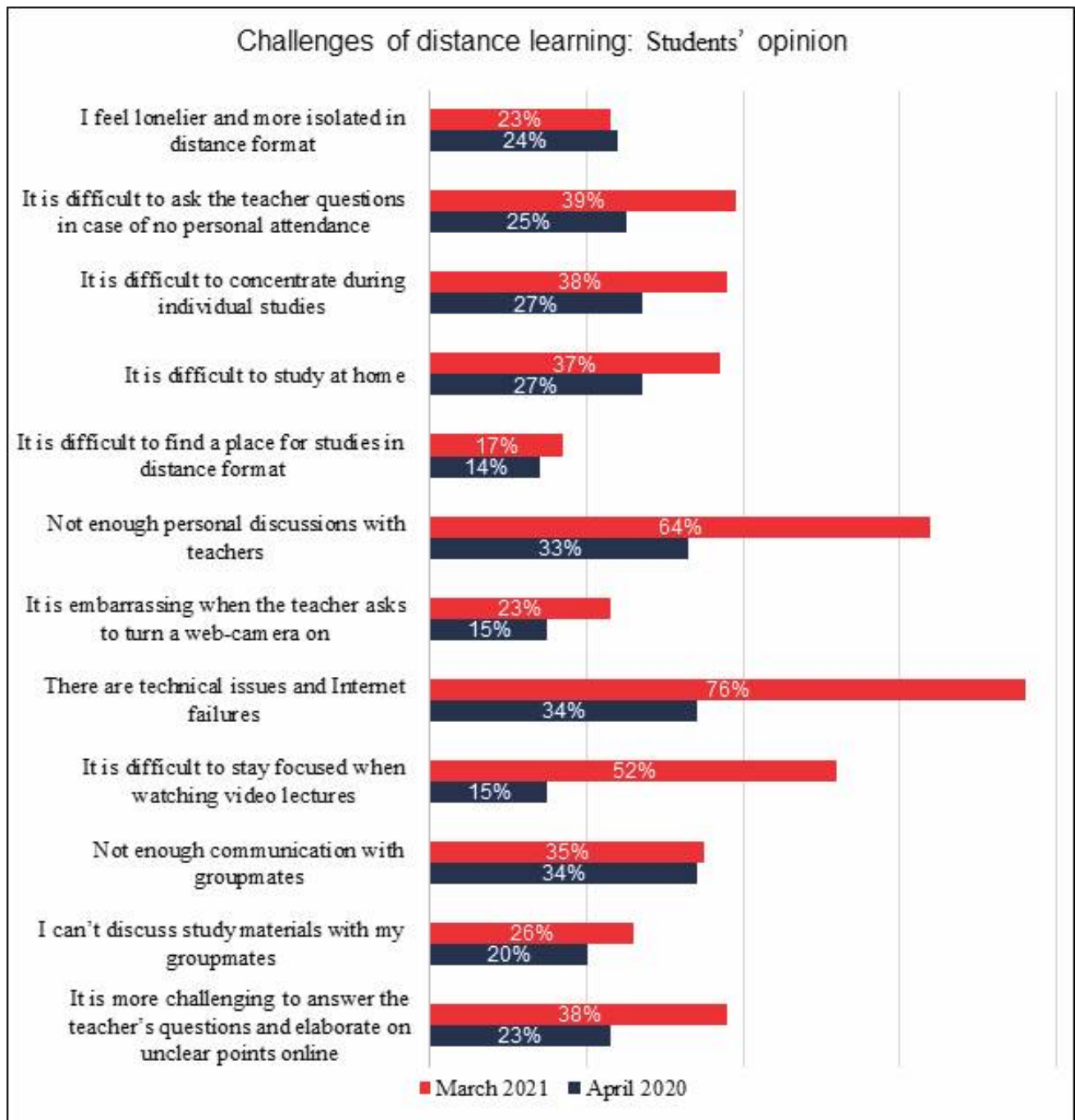
A great challenge under the new conditions is how to keep students' attention; half of respondents claim that it was challenging for them to keep attention while watching a video lecture. In online format, students are not ready to perceive a one-and-a-half-hour lecture. It is known that students perceive well the video lectures that last no more than 15-20 minutes (TED – What is it and why do we need it? 2019, Soper 1999). Then their attention declines, they get distracted by other things and the learning process becomes inefficient. A year ago, only 15% of students reported having attention difficulties. At that time, MS Teams only started to be implemented in the learning process. When students started using the software and listened to lectures online, they found it new and interesting. They had no problems with attention keeping.

Under the new conditions of online learning, lecturers have to find a new way to interact with the audience, new methods must be learned such as augmented and virtual reality, discussions must be ongoing.

The unusual format influenced the social and psychological climate of learning. The following problems are rather common: the students found it difficult to concentrate when studying individually (27%, SD = 6 / 41%, SD = 12), it was challenging to study at home (27%, SD = 15 / 37%, SD = 12), feeling lonely and isolated (24%, SD = 9 / 23%, SD = 14), difficult to ask questions to the teacher (39%, SD = 8 / 25%, SD = 11), The last issue is also associated with Internet connection failures. Besides, not every student had modern personal computers and laptops capable of playing audio and video files of high quality. During the classes in MS Teams, these parameters may determine the quality of communication between teachers and students.

Most respondents (52%, SD = 8 - April 2020 / 61%, SD = 12 - March 2021) are sure that it is more challenging to pass an online examination.

Most respondents (59%, SD = 4) find blended learning an optimal option when all possible ways of communication between the teacher and student are used. This data fully confirms a modern trend to gradually adopt blended learning that combines



**Fig. 6 : Challenges that the students face during distance learning**

conventional learning, distance learning and online methods. In particular, T. Jovsi, J. Foster et al. note that blended learning can have a positive effect and it actually influences students' achievements when used to supervise and maintain the distance learning (Jowsey et al 2020; Massoud et al 2011; Picciano 2009; Moskal et al 2013).

In this manner, according to the research, it may be asserted that the sudden and forced adoption of distance learning was rather smooth but had problems and outcomes as expected. Surveys of the like should be frequent to obtain feedback from students and track the dynamics of their attitudes. New organizational measures should be taken backed by research results.

## B. Recommendations to Eliminate Disadvantages of Microsoft Teams

The analysis of issues that SPSUACE teachers face when working with Microsoft Teams and that they reported in their personal accounts at the university portal as well as own experience of working with this platform allowed the authors to identify a number of disadvantages that must be eliminated to ensure more efficient work at the platform.

1. The authors believe that working with Teams in the area of higher education requires a different approach to creating teams. Teams must be created according to discipline names, for example, Metrology (Fig. 7). The number of students divided into groups and studying various subjects can be different. Sometimes it can be a single group, while in other cases it can be 30 groups or more. In the first case, the current procedure to organize work in Teams is rather convenient for lectures and practical classes. The situation is much more complicated when the discipline is studied by a high number of students divided into several lecture flows. Each flow includes 4-5 groups of students. Lectures and practical classes are given by different teachers. The current organization of work in Teams allows giving lectures at the General Channel and at additional channels. However, it is inconvenient to give practical class at additional channels since it is impossible to use such a powerful tool as Assignments. To distribute assignments to students, deliver completed assignments to teachers for checking, correction of mistakes and comments, considering students' works, their evaluation, etc., teams for individual groups of students must be additionally created. This is inconvenient for either teachers or students. Therefore, the authors believe that it would be reasonable for developers to provide access to the Assignments tool at additional channels to organize a convenient learning process at Teams.
2. It should be also noted that the integrated Word 365 is fiercely blamed by both teachers and students. This usually includes compatibility issues with other Word versions.
3. The following issues are identified when working with the Assignments tool:
  - When delivering the completed work for the first time, students forget to press Deliver after uploading the file. In this case, the student's work receives Viewed status rather than Delivered as it should be when the work is delivered. Therefore, the teacher does not notice this work.
  - A similar situation occurs when the work is re-delivered after check by the teacher. In this case, the work remains in the Returned section where checked works are located which are passed or require correction. Such works are not tracked or checked by the teacher. The authors believe that the program developers should prevent an opportunity to leave this page without pressing the Deliver button.
4. When checking PDF files, it is impossible to make comments and highlight mistakes in the text when working in the Teams environment.
5. When making a video record of the meeting, Teams does not support White board record which is very convenient when taking lectures using a

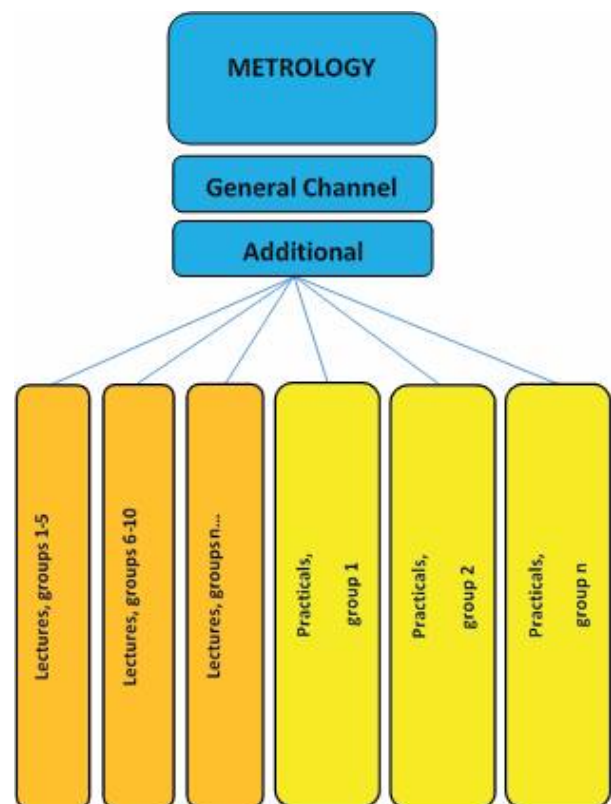


Fig. 7 : Organization of the learning process at the Microsoft Teams platform

drawing tablet. This creates an environment very close to giving lectures in a classroom using a usual board. Viewing this video record will give little help to the student in studying the discipline.

6. The proctoring system must be improved. To minimize unfair behavior of students when taking exams in Teams, it would be reasonable to provide student's video camera control, which is not combined with the monitor. The video camera must provide panoramic image of the student's position at the desk during examination and an ability to zoom in the image. In this case, the teacher would be able to control all student's actions during the exam, see what is on the desk and prevent the use of cribs by the student.

## 6. Conclusion

The analysis of adopting distance learning allows making several paramount conclusions:

- according to respondents, the conventional form of learning is currently the most efficient, up-to-date and high-quality since it includes the most important part of the learning process – personal communication with the teacher, quick feedback, discussion of pressing issues, finding gaps in own knowledge by communicating with the teacher in class;
- the existing state of the art and development of necessary software, restricted Internet capabilities, current levels of organizing distance learning prevent from high-quality education comparable with the quality of education provided by classical full-time learning;
- primary complications in adoption of distance learning include no personal communication with the teacher and no instantaneous feedback since the teacher spends much more time than in personal communication to give an answer to the student's question. Feedback in distance learning can depend not only on dialog participants but also on equipment, Internet connection, server failure or blackout, etc.;
- students require flexible learning pathways and diverse forms of learning. This means that our universities must meet this demand by removing barriers for flexible and customized learning pathways;

- we need a development program for digital tools and digital content necessary for organization and delivering online practical classes, virtual laboratories, using simulators, virtual and augmented reality.
- applying MS Teams in distance learning allowed us to reveal the drawbacks in the organization of educational activities on this platform. We offered some solutions to compensate for these drawbacks and make the platform more comfortable for the learning process organization.
- a serious issue is deficiency of practices for online evaluation of students' performance. Examination sessions and thesis defense in Russian universities were only possible in person and there is no experience of massive use of the monitoring system. It is required to expand the use of high-quality and objective tools of online evaluation.

In case of more detailed consideration of distance learning, there is a lot of additional opportunities for students and teachers. On the other hand, distance learning is significant today and will be in the future (some scope of various subjects can be given as a distance lecture). The necessity to develop and implement a new model of learning process that can be called combined has become obvious. In this model, conventional interaction of students and teachers, practical, scientific and social activity in usual forms are combined with online-courses and trainers, synchronous distance learning and digital didactics.

In our digital century, we must use all technological ideas and skills to keep up with the times. It is not required to fully replace a classroom teacher and personal communication but reasonably combine various functions of technical progress and full-time attendance. This will result in modernization and improving of the entire learning process, and objectives of the education system will be achieved.

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