Reliability and quality of distance learning technical education in the context of the COVID-19 pandemic: practice and issues

Yuliya I Klepalova¹, Igor P Yur¹, Yulia N Tarasova¹, Olga G Savka² and Elena V Maystrovich³,⁴

¹ North-West Branch of the Russian State University of Justice, 5, Alexander Park, g. St. Petersburg, 197046, Russian Federation
² MIREA - Russian Technological University, 78, Vernadsky Prospect, Moscow, 119454 Russian Federation
³ Stolypin International Institute of Informatization and Public Administration, 11/2, st. Malaya Semyonovskaya, Moscow, 107023, Russian Federation
⁴ RUDN University, 6, st. Miklukho-Maclay, Moscow 117198, Russian Federation

E-mail: klepalova.yulia@yandex.ru

Abstract. The covid-19 pandemic, which was announced in March 2020, has made significant changes in all spheres of society, the state and the world in general. A quick restructuring of many structures, processes and mechanisms was required. The education system is no exception. The educational process was modernized, a large number of new technologies were introduced and the existing mechanisms were improved. So, in the conditions of the forced transition to training using distance educational technologies in the spring of 2020, it becomes necessary to assess the quality of the functioning of educational software in the higher technical education system. This article is aimed at researching and analysing the practical and theoretical aspects of the use of distance learning technologies in order to determine the correspondence of the quality of distance learning to the traditional form of full-time education. The authors of the article pay attention to the possible prospects for the development of distance learning within the technical education system in the Russian Federation, not only as a response to changing epidemiological conditions, but also as a potentially alternative form of education. The study assesses the success of using software systems, identifies the advantages and disadvantages of the existing system of distance education.

1. Introduction

Before the outbreak of the pandemic, information and technical systems were viewed as learning aids by both teachers and students. However, when it became impossible to implement the usual teaching methods in the format of face-to-face lectures, seminars and laboratory work, the staff and managers of the educational system had to turn to auxiliary educational tools as the main means of teaching. Not so long ago, before the global spread of the Internet, the impossibility of realizing face-to-face classes would inevitably lead to the complete cessation of the work of educational institutions. Statistical reviews and recent studies indicate that to date, most educational institutions have been able to overcome the difficulties that have arisen, however, there is an urgent need to study the status and performance indicators of existing software in the field of education to determine the deficiencies and...
weaknesses of the system. Highlighting the most effective distance learning platforms, disclosing the advantages and disadvantages of remote lectures and seminars is important for educational organizations of all types, students, as well as authorities. There is an opinion that the future of education lies behind distance learning, and the classroom format will become a thing of the past [1]. In contrast, there are suggestions that distance education will still only help to full-time education [2]. Absolutely agree or disprove each of the It is still early to make these claims, however, it cannot be denied, that in the future the world will not have to face new challenges and threats that will again lead to the need for remote working methods. It is worth considering this fact and timely developing the possibilities of remote learning, looking for the most effective methods of adapting personnel to non-standard conditions, including improving the quality and reliability of software. Distance learning systems enable organizations to quickly conduct certification and training, inform employees and students, regardless of their location. To choose the most suitable distance learning systems, it is necessary to determine the goals that need to be achieved through the implementation of the system. It is required to clearly understand the target audience and the needs of users of the system used. Only after determining these aspects is it possible to proceed to the search for the most suitable technological solution.

2. Materials and methods
The methodological basis of this study is the extensive analysis of the practices of using software systems by educational institutions conducted by the authors. Also, the most popular and effective software systems of domestic and foreign production were highlighted, the positive and negative aspects of the work of students and teachers with them were analyzed, and general recommendations were synthesized to overcome negative factors.

3. Results
At the beginning of the period of isolation and the transition of educational institutions to a distance mode, the Ministry of Education did not give clear algorithms for further actions, as a result of which educational organizations of all levels were left to their own devices to a greater extent. The failure to provide a clear plan and specific recommendations was justified by the fact that the conditions of the pandemic were unprecedented, which is why the urgent formation of a new system of norms and rules could only harm the current course of events, therefore it was decided to rely on the initiative and self-regulation of educational institutions [3]. In view of the prevailing conditions, there was no time to transfer educational organizations to a single open source software. In addition, the use of a variety of systems made it possible to subsequently select the most suitable one, based on general practice. As a result, platforms such as Discord, Skype, Zoom, as well as domestic events have proven to be the most popular by now.webinar.ru iSpring Learn, ShareKnowledge, Teachbase, Docebo, e.Queo, cTutoriumLMS, Mirapolis LMS, WebTutor, Unicraft [4]. Popularity also acquired distance learning systems platforms, which are online storage of training courses. A lot of materials were posted on both national and international platforms such as NPOO, Coursera and edX [5].

Educational organizations used platforms to unify planning processes, for example, creating and publishing class schedules and ratings, maintaining electronic progress journals, monitoring, reporting, news of institutions, etc. Teachers and teachers were able to form provide access to online courses, methodological complexes and educational materials, conduct lessons, lectures, seminars. However, it was not possible to ensure a complete and most effective transition to distance learning from the first days. Transferring at least one academic discipline requires a lot of effort and work of not one, but several specialists. Preparing and uploading educational materials, familiarizing and sometimes training teachers to work with information systems seemed to be a difficult task, especially given the insufficiently developed administration system on specialized platforms of distance education [6]. A good result was shown by the Digital College of the Moscow Region platform, introduced in 2016-2019, organizing the interaction of 49 educational organizations of the Moscow region, 6 regional centers of competence and a system of education authorities, as well as organizations involved in
supporting the operation of the software system in the region. The Digital College of the Moscow Region has become a comprehensive solution that ensures the collection and storage of educational materials, organizing the interaction of educational institutions for the exchange of practices, teaching materials and work results. Moreover, in April 2020, the platform was expanded to include it in the database of the St. Petersburg college system. With regard to the practice of other regions, we can cite as an example the successful transition of secondary specialized institutions of the Republic of Tatarstan to the resources of “The Educational Environment” project, the Vladimir region, to digital solutions from the large publishing house “Yurayt” Colleges of the Vladimir region, in the transition to distance learning, used digital solutions developed by the “Yurayt” publishing house. Social networks and instant messengers, such as VK, Facebook, have proven themselves well. WhatsApp, Viber and others. These Internet platforms have long been familiar to both students and a number of teachers, therefore, when switching to remote mode, many turned to them as the most convenient and quick way to transfer the necessary data.

Speaking about the shortcomings of information systems, it is worth noting that at first it was reported about a lot of interruptions in the work of educational open source software throughout the country. Also, one cannot exclude the important fact that, despite the completed transfer of lectures and seminars to a distance mode, a certain list of training sessions, assuming an exclusively full-time format, was at risk of non-implementation in the current academic year. These types of classes include laboratory work, practical lessons in physical education, classes in educational institutions of creative specialties, practice of students of the last years of colleges and universities. As an alternative, students were offered online trainings and video lessons with a large amount of educational material, but this format cannot be called a worthy substitute for the classical form of classes, especially in the context of such socially significant specialties as, for example, medicine, engineering, etc [7]. According to the data provided in the course of surveys of students and teachers, more than half of the teachers experienced difficulties in the process of working with SPE, and most of the students note that the transition to the distance format influenced the quality of the assimilation of the passed material [8]. The list of negative factors of distance learning also includes the lack of face-to-face contact between students and a teacher, a significant decrease in the interaction of pupils and students with each other, the complexity of organizing personal time management, a language barrier for foreign students.

4. Discussion
Consider the above facts, we can conclude, that the educational space of the Russian Federation over the past period has undergone a number of extensive changes. Various methods, approaches and technologies of education were tested, which had not been used before for one reason or another, despite the long existence of a distance education format at universities and colleges. There is an opinion that the insufficient development of the information environment in the education system is due to the socio-economic and political situation at the moment when distance learning was started in the country [9]. At the present time, the period of the pandemic should be considered not as a temporary difficulty and wait for a return all structures and organizations in the previous mode of operation. It is necessary to learn the appropriate lessons, respond to emerging challenges and update the state of the current education system in accordance with the crisis conditions and taking into account the fact, that the accumulated practices will be fixed as permanent ones. So, on the one hand, the forced transition to distance learning during a pandemic, on the one hand, made it possible to master various technologies, platforms and services, adapt to them, and check the reliability of the structure of education. On the other hand, the small amount of time left required to master and assimilate new methods of work “on the spot”, without interrupting work or study. This has made it impossible to act forward, for example, in the case of examinations and appraisals. The distance education format requires a period of adaptation, passing refresher courses for employees, building a work plan for pupils and students. The issue of unrealized practical exercises stands apart. Students of secondary and higher education institutions cannot acquire a sufficient number of competencies to enter their future professions. At the moment, it seems possible to fill these gaps only by postponing
classes to a later date, but what about those students who finish their studies during a pandemic? The destabilization of the educational process in many specialties over time can also affect the labor market. Obviously, the greatest disadvantage of the software for distance education is the instability of its functioning. Despite the fact that the number of failures has decreased significantly since spring 2020, it cannot be said that one can stop at the achieved reliability result. In our opinion, the decision to create duplicates of the main open source software used by educational organizations can become effective. If one system is unstable, then the students and staff of the educational institution will be able to use the reserve platform without losing the stability of the educational process. It also seems a possible alternative to develop offline platforms that do not require constant access to the Internet. Such tools will be less flexible, but may contain a certain amount of data needed, for example, to prepare for classes or a homework list.

5. Conclusion
Summing up, we can say that the difficult period dictated by the pandemic tested the education system for strength and flexibility, checked the level of its readiness for urgent adaptation and unprecedented conditions. The distance format has proven its importance and relevance. The current conditions forced the administrative bodies of educational organizations to look at their professional activities from the other side, to assess the level of training of employees, the quality of information educational resources and communication channels, the degree of students' readiness to work remotely. Working with electronic resources requires a good organization of databases and various registers, timely accounting of incoming information, ensuring the smooth functioning of the systems used, a quick response to emerging difficulties, building a work plan taking into account the existing nuances [10]. However, the use of open source software reduces the cost of purchasing consumables, materials and educational literature, makes it possible to build your personal schedule without dependence on many factors, completely eliminates the time spent on the road to the place of study and back [11]. The era of digitalization is developing rapidly. The results of technical advances will affect all spheres of society and state life. The Russian education system has gone through a severe stressful period, but it is safe to say that overcoming the difficulties that have arisen has been largely crowned with success.

References
[1] Bąk T, Kardis M, Valco M, Kalimullin A M and Galushkin A A 2019 A philosophical-sociological diagnosis of youth subcultures in the context of social changes. XLinguae 12(2)163-85
[2] Bushuev I V, Nekatevskaya Yu B and Tolstokora O N 2020 Problems and prospects of development of distance learning in modern Russian higher education. Bulletin of the South-Russian State Technical University (NPI) Series Socio-Economic Sciences 13(4) 14-21
[3] Lessons from the "stress test". Universities in a pandemic and after it Retrieved from: http://www.tsu.ru/upload/medialibrary/add/uroki-stress_testa-vuzy-v-usloviyakh-pandemii-i-posle-nee.pdf
[4] Svishchev A V and Kazaryan M A 2020 Effectiveness of implementation of distance education in the educational process using information systems and technologies. Colloquium-journal 10(62) 65
[5] Zernov V A, Manyushis A Yu, Valayavy A Yu and Uchevatkina N V 2020 The educational space of Russia after the pandemic: challenges, lessons, trends, opportunities. Scientific works of the Free Economic Society of Russia 3
[6] Grinshkun V V 2018 Problems and Ways of Effective Use of Informatization Technologies in Education. Bulletin of Moscow University. Series 20: Teacher Education 2 34-47
[7] Alekseeva A Yu and Balkizov Z Z 2020 Medical education during the COVID-19 pandemic: problems and solutions. Medical education and professional development 2(38) Retrieved from: https://cyberleninka.ru/article/n/meditsinskoe-obrazovanie-v-period-pandemii-covid-19-problemy-i-puti-resheniya
[8] Smakhtin E S, Klimova I I, Arkhipova V S, Andrievskii K V, Shalamova O O and Sidorova N A 2018 Verbalizing emotions in texts of economic mass media. *XLinguae* **11**(3) 103-113

[9] Alexander G K and Ruslan I K 2020 Actual problems of distance learning. *Education. The science. Scientific personnel* 4 Retrieved from:: https://cyberleninka.ru/article/n/aktualnye-problemy-distantsionnogo-obucheniya-1

[10] Morozov A V and Samborskaya L N 2020 Features of electronic education in the context of digitalization. *Education management: theory and practice* 2(38) Retrieved from:: https://cyberleninka.ru/article/n/osobennosti-elektronnogo-obrazovaniya-v-usloviyah-tsifrovizatsii

[11] Seregina Tatiana, Masalimova Alfiya, Usak Muhammet, Dorozhkin Evgeniy and Galushkin Alexander 2019 Philosophical view on the problem of degradation and regeneration as potential trends in interethnic communication culture. *XLinguae* **12** 186-194