Organizational and Pedagogical Problems in the Process of Distance Learning at a University

Ekaterina Blagoveshchenskaya[a], Victor Garbaruk[a], Nina Popova[b]

[a] *Petersburg State Transport University of Emperor Alexander I, Moskovsky pr., 9, St. Petersburg, 190031, Russia*
[b] *Peter the Great St. Petersburg Polytechnic University, Polytechnicheskaya st., 29, St. Petersburg, 195251, Russia*

Abstract

The article is devoted to the analysis of the existing organizational and pedagogical problems of distance learning in a contemporary university. The problems of distance learning solved at different levels are considered, such as those at the levels of the university authorities and ministries, university departments and higher schools, technical departments of the university. A comparative analysis of the scientific and methodological literature on distance learning is carried out, the results of students' and teachers' survey are studied. Practical importance of the information duplication principle is shown when conducting online teaching for any distance learning disciplines. Duplication of informing students in the process of distance learning in two universities of St. Petersburg, PSTU and SPbPU, which contributes to an increase in reliability in conducting classes, is illustrated with specific examples of teaching translation practice and mathematics.

Keywords [1]

Distance learning problems; learning technologies; duplication of information, translation practice, mathematics.

1. Introduction

Distance learning at the university became especially relevant in the spring of 2020 due to the aggravation of the global epidemiological situation, when all universities were forced to transfer their students and teachers to self-isolation. The use of such electronic resources as MS-Teams, Mirapolis, Zoom, in general, based on our observations of the educational process and questionnaires of distance learning participants, was found suitable for online learning. The experience of our participation in the implementation of this large-scale experiment deserves analysis in this article, aimed at considering organizational and pedagogical problems identified in the process of teaching students in a distance format. Consideration of these problems and possible options for their solution is considered relevant, since there is still no sufficient information in the literature on the assessment of distance learning, which, with a high degree of probability, may again, with a worsening of the epidemiological situation, become prevalent.

Overall, COVID-19 has had a serious impact on students, teachers and educational organizations around the world [1]. The pandemic has forced colleges and universities across the world to close

SLET-2020: International Scientific Conference on Innovative Approaches to the Application of Digital Technologies in Education, November 12-13, 2020, Stavropol, Russia
EMAIL: kblag2002@yahoo.com (Ekaterina Blagoveshchenskaya); vvgarbaruk@mail.ru (Victor Garbaruk); ninavaspo@mail.ru (Nina Popova)
ORCID: 0000-0002-2425-5556 (Ekaterina Blagoveshchenskaya); 0000-0002-9983-4712 (Victor Garbaruk); 0000-0003-3058-7386 (Nina Popova)

their campuses so that students can follow social distancing measures. [2] The sudden transition to online learning has become an indicator of the flexibility of universities in terms of organizing distance learning [3], when academic institutions focused on transferring educational content to the digital world. The main disadvantages of online learning, noted by students of higher education institutions, were the lack of personal interaction with the teacher, the long response time of the distance learning system to requests and the lack of traditional socialization in the learning process in university classrooms.

Despite these shortcomings, we must acknowledge that online learning experienced during the pandemic has become a familiar resource that can be used as a complementary learning tool. Currently, the majority of university students in Russia study in two formats: mixed (full-time education + distance learning) and distance learning proper. According to the new rules, all streaming lectures attended by more than a hundred people are transferred online into classrooms called "webinar rooms", which are virtual counterparts of the university audience. At the same time, practical and laboratory classes, master classes and lectures in small groups are conducted in person.

The urgent task of educators today is to quickly overcome the barriers to the introduction of mass distance learning, increase its efficiency, as well as the progress of students. Not all educational organizations, and not all teachers, turned out to be ready to change the training format and communicate with students, to solve educational and pedagogical problems in a digital environment [4].

The objectives of this article are to review the general organizational and pedagogical problems of distance learning in a modern university and to consider the solution of a specific practical problem of increasing the reliability of informing students in the process of distance learning in two universities in St. Petersburg.

Research methods: observation of the educational process, comparative analysis of scientific and methodological literature on distance learning, questioning students and teachers.

2. Literature review

In the scientific and methodological literature, mainly organizational and pedagogical problems of a general nature are considered. Examples of the most common problems include the following: the possibility of developing distance education standards (following the example of the Federal State Educational Standard) in terms of requirements for the composition and technologies used; the need to develop copyright and related rights to educational and teaching materials for distance education; difficulties in obtaining distance education according to individual plans; distribution of teachers' workload and their funding, taking into account distance and traditional forms of education [5], etc. The indicated problems seem to us to be very urgent and require solutions at the levels of the Ministry of Education and Science or the university authorities.

The second category of general problems of distance learning can be, in our opinion, addressed to university departments and higher schools, which can solve them at their own level. This is a lack of time for teachers to develop courses based on new technologies, a shortage of training and support personnel, a lack of time to assess the potential of new technologies in teaching and revision of training courses. There is also a need to strengthen the student support function in the context of the student's growing role in the educational process, the lack of time for teaching instructors how to use new technologies in the educational process. The system of encouraging work on the introduction of new technologies into the educational process and recognition of developers, expressed in promotion, etc., has not been worked out either [6].

The problems of distance learning are also the difficulties associated with the development of learning technology, such as lack of methods for the effective implementation of distance learning, choice of forms of learning, insufficient number of e-courses, poor development of multimedia learning technology. In addition, there are problems associated with the design of training programs like writing software, the introduction of training programs when designing a distance learning route [7, 8]. In exact disciplines, there has always been a need for sets of tasks, that are similar in logical and computational problems, but having different numerical conditions. In technologies related to training and control through telecommunication systems, the verification of the response is assigned

to the distance learning system. Not all branches of mathematics have algorithms allowing to create programs that meet learning goals. Good distance programs have been created, for example, for studying various branches of linear algebra, vector calculus [9, 10, 11] and some others. An overview of various methods of automatic creation of banks of mathematical problems is given in works [12, 13-14]. The solution to such problems can be addressed to the technical departments of universities responsible for the technical organization of distance learning at the university.

The problem of technical failures during remote work may be considered as a separate category of problems associated with the organization of distance learning, since in the process of analyzing the distance learning process it was revealed that many educational platforms and Internet resources were not ready for a remote format of work with a heavy load in conditions of mass demand for their services. This led to errors during registration and authorization, difficulties when working in the personal account, problems when sending educational materials and checking them, failures in the storage systems for assessment results. It seems to us that all technical problems need to be solved at the level of the relevant department of the university responsible for improving the local electronic information and educational environment (EIE), which has become the most important attribute of any modern university [15].

The structure of the main organizational and pedagogical problems is shown below in Table 1.

Table 1

The structure of organizational and pedagogical problems

Problem solving level	Problem content
Authorities of universities and ministries	Development of distance education standards (following the example of the Federal State Educational Standard); financing, taking into account distance and traditional forms of education, etc.
University departments and higher schools	Lack of time for teachers to develop courses based on new technologies; shortage of training and support personnel; lack of time to assess the potential of new technologies; lack of a system of incentives for teachers, etc.
Technical departments of the university	Designing training programs; writing software products; introduction of training programs; prompt elimination of failures, etc.

The electronic information and educational environment (EIEE) provides access to curricula, discipline syllabi, electronic educational resources; fixing the course of the educational process; conducting all types of classes, procedures for assessing learning outcomes, distance learning technologies; formation of students' electronic portfolio, with the preservation of the students' work, reviews and ratings for these works from any participants in the educational process; interaction between the participants of the educational process, including synchronous and (or) asynchronous interaction through the Internet during the independent work of students in the EIEE [16].

Concluding our brief review of the current scientific and methodological literature, we can note that distance learning can be viewed mainly as a form that complements traditional education at a university. The quality of distance learning has not yet reached a high level due to numerous general problems. All the challenges we have identified are mainly described by the authors of the articles at the stage of establishing their existence, but no specific solutions have yet been proposed. As for the solution of specific organizational and pedagogical problems of a practical nature, their consideration remains essential for distance learning.

Let us further consider the results of a survey conducted in Russia with participation of numerous student cohorts and teachers involved in distance learning and an example of an organizational and pedagogical solution to the practical problem of increasing the reliability of informing students in the process of distance learning at SPbPU and PSTU during the period of self-isolation in the spring

semester of 2020. An increase in the reliability of informing students was noted due to the realization of the duplication principle in the use of traditional and innovative electronic resources.

3.Research results

An analysis of the opinion polls of students and teachers as participants in the distance learning process known to us from the literature is also important for our general understanding of the existing diverse problems in the distance learning system. For example, the Institute for Social Analysis and Forecasting (INSAF) representing Sociological Data Portal of the Russian Presidential Academy of National Economy and Public Administration (RANEPA) conducted a survey of teachers and students concerning their attitude to distance learning in all branches of the academy. 12,201 students from 53 branches of the RANEPA (almost a third of all students of the Academy) took part in the student research in May. Students were asked to rate the quality of online learning by answering four questions: whether they have more free time, how convenient this form of learning is, how convenient, in their opinion, is it for teachers, and whether respondents prefer face-to-face training to distance learning. Students' responses were comparesd with responses from 4,000 academy professors who were interviewed in April.

Most respondents of both groups believe that the quality of distance education is worse than that of traditional full-time education. Students turned out to be much more loyal to online learning. In particular, 55.4% of students and 87.4% of teachers felt that they had less free time due to the transition to a remote form of education. 47.7% of students and 53.8% of teachers recognize this form as inconvenient. 35.8% of students think that online is not convenient for teachers. The share of teachers who answered that it was uncomfortable for them to teach online is much higher - 62.1%. It is better to study in classrooms – this is an opinion of 69.6% of students and 85.5% of teachers, who prefer the full-time form of learning to the distance one [17, 18].

In the distance learning system of PSTU (the Russian abbreviation of this university is PGUPS), built on the LMS MOODLE platform, with a sharp increase in users, training materials and student responses, there were three system failures that lasted from one to five days. At the very beginning of distance learning at SPbPU, it was recommended to use the *GOOGLE Classroom* electronic resource, which is a fairly good combination of didactic usefulness and ease of use. In addition, *GOOGLE Classroom* was chosen, apparently, also because the organizers of distance learning at EIEE SPbPU foresaw the possibility of technical failures in the massive access to the virtual platform LMS MOODLE, which was well tested at the university. Thus, the organizers of distance learning at the university deliberately allowed the duplication of two electronic resources to ensure greater reliability of the entire distance learning system.

The problem of duplication is known in science and can, in particular, be solved when determining the reliability of information in the field of economics. In this case, statistical methods can be used, simple models for analyzing intersectional relations, using probabilistic methods and methods of information theory. However, despite rather high level of such decisions, this problem of the reliability of socio-economic information cannot be considered sufficiently researched and solved. The solution can be the technology of duplicating information, the essence of which is to find a compromise between reducing the number of inputs and maintaining the quality of decision-making in conditions of possible distortions of input information [19].

Table 2

Examples of information duplication in teaching translation practice

№	Content of teachers' (1-5) and students' (6-7) actions	Main resource	Duplicate resource
1	Placement of materials for translation in classroom mode	Google Classroom	LMS MOODLE
2	Posting homework materials	LMS MOODLE	Corporate student group email
3	Conducting test papers	LMS MOODLE	Corporate student group email
4	Conducting the written exam	LMS MOODLE	Students' personal email

	and oral interview	MS TEAMS	
5	Show presentation in Power Point	MS TEAMS Screen Sharing	Corporate student group email
6	Posting completed homework assignments	LMS MOODLE	Corporate teacher's e-mail
7	Posting the completed exam assignment	LMS MOODLE	Corporate teacher's e-mail

The principle of duplicating information when conducting distance learning at the university is, in our opinion, of great practical importance for any distance learning disciplines. To implement the principle of duplication, teachers need to use not only innovative resources, such as, for example, MS TEAMS, during training, but also widely use previously developed resources that can now be considered traditional. We mean, first of all, e-mail, which can be effectively used in the educational process. Examples of information duplication when teaching translation practice at the SPbPU at the Institute of Humanities are shown in Table 2.

The duplication in use today is necessarily associated with the INTERNET. If the learner does not have a network outlet, duplication also consists in providing the student with books, teaching aids, training programs, etc., with the help of which he could study independently for some time.

When teaching mathematics in a distance mode, textbooks intended for distance learning become the means of duplicating. To improve distance learning, it is necessary that existing mathematical textbooks focused on independent work be revised, selected and recommended to students. Such textbooks have their own characteristics, which have not yet been fully formulated. Universities must have the required number of textbooks suitable for distance learning.

A textbook focused on the students' independent work, in addition to theoretical material, should contain a large number of different problems, both with detailed solutions and brief instructions on how to solve them. In order for the student to be able to realize how correctly they have mastered a textbook section, the textbook itself should contain a set of simple questions for self-examination, which are usually called tests.

4. Conclusions

1. When carrying out on-line training, it is necessary we additionally use the technical capabilities associated with the form of full-time teaching (for example, Zoom). The possibility of communication, as well as the presence of the teacher in the classroom, even if it is virtual, makes the learning process psychologically more comfortable, as it includes the usual elements of classroom activities.

2. Duplication of information on different resources ensures the reliability of its receipt by students in different situations and having different technical communication capabilities.

3. The consistency of technical methods in teaching different disciplines at the same university (for example, mathematics and foreign languages) creates a common basis for habitual actions, which frees the intellectual abilities of students to concentrate on the subject, and not on the accompanying sides.

4. An organizational structure within university departments should be created for flexible response to special circumstances associated with possible technical failures. At the same time, duplication of information should ensure continuity of communication with students.

5. A system of incentives should be created to affect the increase in personal rating for teachers who show high professionalism and adaptability in the context of an increased need for the use of digital technologies.

6. A separate task is the creation of special textbooks with specific links to the information resources used, the presence of which in the paper version is in no way connected with digital technologies, which makes them a completely reliable source of theoretical knowledge. At the same time special manuals simultaneously spare the students health in terms of preserving vision and avoiding overwork, which, unfortunately, can accompany excessive use of monitors in all their variants.

5. References

[1] M. Adnan and K. Anwar, "Online learning amid the COVID-19 pandemic: Students' perspectives". Journal of Pedagogical Sociology and Psychology № 1 (2020) 45-51.
doi: 10.33902/JPSP.2020261309
[2] C. M. Toquero, Challenges and opportunities for higher education amid the COVID-19 pandemic: The Philippine context, Pedagogical Research № 4 (2020) 162-175.
doi: 10.30935/ijpdll/8311
[3] Z. Wu, How a top Chinese university is responding to coronavirus, Retrieved from World Economic Forum. URL: https://www.weforum.org/agenda/2020/03/coronavirus-china-the-challenges-ofonline-learning-for-universities.
[4] T.V. Malkova, A.Yu. Baranov, Some organizational problems of distance learning. Modern science № 4 (2020) 278-280.
[5] E.V. Fadeev, Organizational and psychological problems of distance learning. The world of science, culture, education № 3 (2017) 308-310.
[6] E.V. Romanov, T.V. Drozdova, Distance learning: necessary and sufficient conditions for effective implementation, Modern Education № 1 (2017) 172-195.
doi I: 10.7256 / 2409-8736.2017.1.22044.
[7] M.S.Chvanova, I.A. Kiseleva, Problems of distance learning on the Internet // Bulletin of the Tambov University. Series Natural and technical sciences № 5 (2017) 1200-1203.
doi: 10.20310 / 1810-0198-2017- 22-5-1200-1203
[8] M.U. Soltogulova, Topical problems of learning in the system of distance education, Izvestiya vuzov of Kyrgyzstan № 5 (2016) 69-70.
[9] S.V. Okishev, P.A. Ashaeva, E.A. Gelmanova, Program-generator of systems of linear algebraic equations with variable element probabilities, Information technologies: topical problems of training specialists taking into account the implementation of the requirements of the Federal State Educational Standard: Materials of the Fifth All-Russian Scientific and Methodological Conference, Omsk, 2018. pp. 267-271.
[10] S.E.Karpovich, V.S Baev, Computer program for studying operations of vector algebra with the possibility of using it in distance learning, Electronic library of BSU, Lviv, 2006. http://elib.bsu.by/handle/123456789/36424.
[11] A.I. Alekseev, V.V. Garbaruk, Generation of homogeneous differential equations. Eurasian Scientific Association № 6 (2020) 367-370.
[12] I.A. Posov, Review of generators and methods for generating educational tasks, Educational technologies and society № 4 (2014) 593–609.
[13] S.V. Okishev, The problem of creating and using generators and solvers of mathematical problems, Internet journal "World of Science" № 3, 2018. https://mir-nauki.com/PDF/56PDMN318.pdf.
[14] V.V. Romanenko, I.O. Aksenenko, Review of technologies for automated creation and publication of test tasks in distance learning systems, Information technologies in science, management, social sphere and medicine: Collection of scientific papers of the IV International Scientific Conference, part 1, Tomsk, 2017, pp. 317-321.
[15] E.R. Orlova, E.N. Koshkina, Problems of the development of distance learning in Russia, Priorities of Russia №23 (2013) 12-20.
[16] E. A. Blagoveshchenskaya, V. V. Garbaruk, N. V. Popova, R. P. Vostokova, E. L. Popova, Psychological and pedagogical aspects of the electronic information and educational

environment functioning in a modern university. Man in the XXI century: Materials of the XI International Scientific and Practical Conference, Obninsk: FSBI "VNIIGMI-MCD", 2020, pp. 116-119.
[17] Teachers prefer a closer look. Newspaper "Kommersant", №. 87, 20.05.2020, p. 2.
URL: https://www.kommersant.ru/doc/4349320
[18] Teachers expressed their opinion on the forced transition of the educational process online, minobrnauki.gov.ru. URL: https://minobrnauki.gov.ru/ru/press-center/card/?id_4=2603
[19] T.A. Vashko, Information duplication technology as a means of improving the quality of decision-making, Problems of modern economics № 14, 2011, pp. 137-141.