

Characteristics of Implementation of Distance Remote Access to Learning in Russian Universities

Características de la aplicación del acceso a distancia al aprendizaje en las universidades rusas

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Summary

The purpose of the study is to identify the characteristics of implementation of remote access to learning at university basing on distance learning technology. The basic methods for the relevant problem studying are pedagogical experiment, expert assessment methods, and statistical processing of quantitative results of the research. The experiment involves the students and professors of the Ammosov North-Eastern Federal University (NEFU), the Herzen State Pedagogical University of Russia (RSPU) and Chelyabinsk State University (CSU). The promising areas of distance learning and its effectiveness have been analyzed and generalized. In addition, factors and conditions for providing quick access to the Internet for the educational process have been identified. The substantive aspect of the implementation of remote access to learning in terms of the Major Professional Educational Programs (MPEP) in the field of Pedagogical Education is examined in order to identify their relevance to the distance learning implementation at university. The most widespread digital services have been studied in addition to their effectiveness for the development of training materials that provide educational opportunities of distance learning in terms of the implementation of remote access to learning. The significance of the implementation of distance remote learning for future teachers training at universities is determined. The results of the study prove the necessity to develop educational and methodological materials for the implementation of new form of training in NEFU, RSPU and CSU.

Keywords: Distance Education; Digital Services; Online Education; Digital Education; Region.

Resumen

El propósito del estudio es identificar las características de la implementación del acceso a distancia al aprendizaje en la universidad basándose en la tecnología de la enseñanza a distancia. Los métodos básicos para el estudio del problema pertinente son el experimento pedagógico, los métodos de evaluación por expertos y el procesamiento estadístico de los resultados cuantitativos de la investigación. En el experimento participan los estudiantes y profesores de la Universidad Federal Nororiental de Ammosov (NEFU), la Universidad Pedagógica Estatal de Herzen de Rusia (RSPU) y la Universidad Estatal de Chelyabinsk (CSU). Se han analizado y generalizado las esferas prometedoras de la enseñanza a distancia y su eficacia. Además, se han identificado los factores y las condiciones para proporcionar un acceso rápido a la Internet para el proceso educativo. Se examina el aspecto sustantivo de la puesta en práctica del acceso a distancia al aprendizaje en lo que respecta a los Programas Principales de Educación Profesional (MPEP) en la esfera de la educación pedagógica, a fin de determinar su pertinencia para la puesta en práctica de la enseñanza a distancia en la universidad. Se han estudiado los servicios digitales más difundidos, además de su eficacia para la elaboración de materiales de capacitación que ofrezcan oportunidades educativas de aprendizaje a distancia en lo que respecta a la aplicación del acceso a distancia al aprendizaje. Se determina la importancia de la aplicación de la enseñanza a distancia para la formación de futuros profesores en las universidades. Los resultados del estudio demuestran la necesidad de elaborar materiales educativos y metodológicos para la aplicación de una nueva forma de capacitación en la NEFU, la RSPU y la CSU.

Palabra clave: Educación a distancia; Servicios digitales; Educación en línea; Educación digital; Región.

Introduction

One of the promising directions of the education development in the Arctic regions and remote settlements of the Republic of Sakha (Yakutia) is distance learning, which involves the implementation of modern information and telecommunication technologies, as well as the use

of distance learning with no direct contact between teachers and students.

The world-wide popularity of this form of education is rather determined with necessary accessibility, as well as the independence from geographical location, age, and level of education than with the coronavirus pandemic. Additionally, this form of training guarantees the free choice of a teacher from any educational organization, which activity is based on the distance education (Radif & Mohammed, 2019; Alrubaie et al., 2020; Aitbayeva et al., 2019).

It must be emphasized that remote access to learning combines several complex-system components and is implemented under spontaneous and unpredictable conditions.

According to the research of a scientific school of Vlasova (RSPU) and Barakhsanova (NEFU), the authors of the present study identify the following possible mechanisms for the implementation of remote access to learning at universities:

- It is necessary to take into account the material and technical equipment, as well as software availability in ulus educational systems in order to implement distance training for the teachers from the North-East of Russia regarding the characteristics of the national regional education system in terms of the pandemic (Barakhsanova et al., 2018a, 2018b);
- To develop and share modular training programs for teachers and educators relating to the implementation of network education in the region (Vlasova et al., 2018, 2019);
- Spatial features, in the North-East of Russia in particular, should be taken into account while implementing distance education technologies and online learning for future educators and teachers training, which is aimed at active development of information competence, mastering the practices of modern information and network technologies application (Tretyakova et al., 2017).

Currently, this issue has not been sufficiently studied, although it is relevant not only in Russia, but also throughout the world, as due to the danger of the virus spread, a transition to distance learning was carried out in all educational institutions in the lockdown period.

An analysis of the foreign research on the issue of distance learning implementation shows that many authors pay special attention to the development of digital literacy and information competence among the students in the modern information society. Thus, the article “Digital Participatory Pedagogy: Digital Participation as a Method for Technology Integration in Curriculum Journal of Digital Learning in Teacher Education” is devoted to the aspects of students and teachers’ digital competence (Dooley et al., 2016). Robin (2016) in his works analyzes the application of modern visual tools in the educational process, such as infographics and video content. The implementation of online tools for e-learning is revealed in the studies of Imran et al. (2016).

It should be noted that the main trend in the implementation of remote access to learning is online courses development. A number of works are devoted to the issues of training materials for teachers in the context of the information technology introduction into the educational process. However, despite all the advantages of online learning, its quality is not always valued. An analysis of a number of publications carried out by a team of authors (Tallent-Runnels et al., 2006) revealed main points in the works on online learning, which are mainly devoted to the studying of educational environment, training efficiency, students’ characteristics, and administrative factors. Nevertheless, the quality of training and the quality of education in general are insufficiently investigated.

Roy (2006) noted that distance learning development had started with the creation of the first mass personal computers Apple II and IBM PC in the 1970s. Shapiro (1984) believes that “one computer - one master” has allowed to make a quantum leap for the integration of information technology (IT) in professional and especially in social activity. In 1981, IBM

developed the IBM 5150 serial PC based on Intel's open architecture with flexible configuration, which later allowed IBM-compatible PCs to dominate the personal computer market (Shapiro, 1984).

The issues related to the implementation of information technologies are reflected in the works of contemporary foreign scientists. Special attention is paid to the problems of application of distance learning and information technology in education and to the formation of the students' digital and information competence. Thus, Hockly (2012) identifies four categories of the students' digital literacy such as:

- 1) Linguistic, i.e., textual, visual, multimedia and code literacy;
- 2) Informational, i.e., literacy in search, selection and evaluation of information;
- 3) Social, i.e., skills of the communication in social networks, cooperation, information security and intercultural context;
- 4) "Redesign" literacy, as a superior type of digital literacy that includes the skills of honest, legal, and ethical transformation, as well as information borrowing and use.

Belshaw (2012) identifies eight components of digital literacy:

- 1) Cultural, i.e., understanding and proper interpretation of the digital context;
- 2) Cognitive, i.e., conceptualization of the digital environment and interaction with it;
- 3) Constructive, i.e., effective participation in network projects and the information transformation;
- 4) Communicative, i.e., understanding of the configuration;
- 5) Confidential, i.e., confidence in one's own technical literacy, the understanding that a person rather uses technology for his own purposes, than becomes its communication media;
- 6) Creative, i.e., the ability to find new ways to accomplish new tasks with new tools;
- 7) Critical, i.e., rather the ability to evaluate resources critically and select them carefully, than just search for information;
- 8) Corporate, i.e., the use of technologies for social processes stimulation in order to allow the students to cope with an increasing amount of information through its critical evaluation.

It should also be noted that some Russian authors point out the following conditions for the development of distance learning:

- scientific achievements in the field of teaching methods and technologies,
- media and communications,
- rapid dissemination and widespread use of information tools and computer technologies,
- satellite communication systems,
- educational television,
- massive connection to information systems,
- the development of computer training programs, and
- social networks, etc. (Zhirkova, 2009; Gafurova, 2010; Osipova & Arnautov, 2017; Prokopyev, 2012; Sorochinsky, 2018; Tretyakova, 2008; Panina & Barakhsanova, 2013).

It is worth emphasizing that distance learning helps to get education in a mobile, timely and effective way. In addition, it provides the following advantages:

- quick feedback between teachers and students;
- possibility of a personal selection of the way to acquire new knowledge

(promotes the implementation of experimental educational programs and improves the quality of education through the use of information and communication tools, electronic libraries, and other techniques);

- reduction in the cost of lectures and practical classes in educational organizations, as well as the cost of training due to the absence of payments for classrooms rent, utilities, travel to the place of study and back, etc.

Materials and Methods

This study was conducted by authors from various regions of Russia during a remote access to learning period from March to June 2020 (St. Petersburg, Omsk and the Republic of Sakha (Yakutia)). This study allowed us to develop a deeper understanding of the problems and tasks of effective student training and their adaptation for work during a pandemic, to identify and develop the necessary general, specific, and relevant educational technologies, that should be adapted to regional characteristics, and possible risks associated with this type of learning.

During the first stage, the authors collected, analyzed, and systematized *a priori* information on the problem of students' readiness to use e-learning technologies to solve professional problems, as well as the means implemented to analyze the pedagogical university students' (future teachers) readiness to solve relevant problems. As a result of the curriculum analysis and educational process study in pedagogical universities in Russia (RSPU and NEFU) in addition to discussions with colleagues, a generalized conclusion was drawn in which distance learning was reduced to the study of the technology techniques through the tasks, which were not even related to education. In addition, many university professors were not ready to conduct classes based on remote access through the Internet.

The methodological background for the present research consisted of several categories:

- development of new content for the training of students in pedagogical universities in the context of an urgent transition to the implementation of access to learning,
- implementation of learning through the Internet, which had not been previously adapted to the educational process, and
- the development of the students' personal electronic educational environment.

During the second stage, a survey was conducted in which the students of the RSPU, who were majoring in pedagogical education, and the students of the CSU, in addition to the master's and bachelor's students of NEFU who were majoring in pedagogical education were involved.

Results

It is worth highlighting we need to determine what to start with to prepare for distance learning. Firstly, it is necessary to study articles on the relevant issue and to determine the means of communication with the students. Basing on the accumulated pedagogical experience, the educator must create educational materials, predetermine the mistakes he or she may make and try to avoid them. Secondly, necessary digital communication services must be determined. In addition, we should consider the organization of online meetings with students, the way of the educational content presentation, and self-assessment tests. We should also conduct monitoring, provide feedback, and prepare training platforms.

The authors of the present article have divided all services into several groups to identify the ones that can be applied in the educational process.

The researchers have also considered some of the most common digital services that are useful for training materials development and for online lesson organization.

1. Zoom (2020) is an interesting service that helps to conduct various video conferences and thematic webinars. Students can connect via phone, installing the application, or with a computer.

2. Facebook Live (2020). This social network allows a closed group creation, where you start live broadcasts and conduct online lessons. There are no time limits in this service, which is a rather positive point.

3. Instagram Live (2020). The video is streamed from the Instagram social network. Students must follow you. You can create a private class account and conduct online meetings there.

4. WizIQ (2020). This service is intended primarily for online training. A class is created, and all participants connect to it. On this platform, you can communicate, ask questions, publish various tasks, conduct surveys, post announcements, and hold so-called online meetings.

5. Periscope (n.d.). This application is developed for live online broadcasts. Students can watch video lessons after the installation of the application on smartphone and creation a personal account

6. Skype (2020). This service is designed for video conferences. Each participant must register and create personal account in Skype. Then a class group is created, and according to the schedule, at exactly the appointed time, a call is made, and all participants connect to the group.

Many students and teachers have never dealt with distance learning. Therefore, the authors of the present article conducted a survey among the students and professors of NEFU and RSPU in order to find out their general opinion about the advantages and the problems of distance learning. The study involved 220 students and 80 teachers. The students and teachers were offered to answer online questionnaire anonymously.

Table 1.
Benefits of Distance Education for Students and Teachers, %

	NEFU Students	RSPU Students	NEFU Academic Staff	RSPU Academic Staff	CSU Students	CSU Academic Staff
Computer Work	100	100	100	100	100	50
Psychological Comfort	5	15	20	35	25	12
Time Saving	40	45	20	30	45	15
The Practice of Independent Use of Electronic Educational Material	60	80	45	75	55	35
Home Study Opportunity	80	65	40	55	82	45
Flexible Schedule	35	50	30	25	50	35

and Learning Pace						
The Opportunity to Work at Any Location and at Any Time	75	85	60	65	70	55
Mastering the Skills of Working with the Distance Learning System	90	95	90	95	90	85
There Are No Particular Benefits of Distance Learning	85	90	60	50	75	65

Table 2.
Difficulties of Distance Learning for Students, %

Questions	NEFU	RSPU	CSU
Lack of Communication with Classmates	90	65	95
Lack of the Assistance from Teachers	100	100	100
Lack of Time due to Housework	85	50	65
It Was Difficult to Make Oneself to Study	75	65	60
Internet Connection Problems	85	35	55
There Were No Particular Difficulties	75	82	70
Other ... Problems with Special Programs	65	45	45

Table 3.
Difficulties of Distance Learning for Professors, %

Questions	NEFU	RSPU	CSU
Other ... Lack of Technical Means and Equipment	25	15	20
There Were No Particular Difficulties	65	70	60
Problems with Modern Technologies	30	25	35

Implementation			
Lack of Communication with Students	90	92	95
The Difficulty of Transferring Knowledge to Students	95	75	80
Not Enough Time to Develop E-Learning Material	85	70	80
Difficulties with the Assignments Check	90	65	75
Internet Connection Problems	75	35	65

Additionally, all the participants were asked the following questions:

1. Have you previously dealt with distance learning?
As a result, 5% of the students and 22% of the teachers answered positively. Therefore, a great number of the respondents dealt with distance learning for the first time.
2. In your opinion, what are the main advantages of distance learning?
3. Are there problems with the Internet connection in the place where you study remotely?
Among the respondents, 73% of the students and 85% of the teachers answered positively.
4. Answering the question about which education is preferable to receive (for students) and to offer (for teachers), 10% of the students chose distance learning and only 4% of the teachers chose distance one. The rest of the respondents chose the traditional form of training.
5. When asked whether it is easy to receive / transmit information, the students answered: easy - 11%, hard - 44%, and no difference - 45%. The teachers answered: easy - 26%, hard - 53%, and no difference - 21%.

According to the survey results, the researchers have identified the following positive moments of distance learning:

- individual training during strictly defined period. The speed and frequency of study is determined by the students themselves, depending on their needs and various family circumstances;
- flexible and free training mode. The students themselves can choose any of the training courses offered for study, plan the time independently, determine the place for studying, duration and frequency of classes;
- accessibility is an important component. The studying is not limited with geographical place of residence and time zone of the educational organization;
- Activity, or mobility, i.e., an effective implementation of energy exchange between a teacher and a student, which is one of the main requirements for a successful learning process.

It is worth highlighting, that over the past two years, various mechanisms have been provided for online learning technologies in NEFU. One of the tasks, set by the university's management for the academic staff of NEFU for the coming years, is the transfer of 20% of classroom training to online courses. This type of mechanism can be attributed to administrative, which is based on the managerial solutions that ensure the implementation of managerial tasks.

In 2020, the author of the present study Barakhsanova organized two training courses, namely: “Electronic Information-Educational Environment (EIEE) in the work of a modern educator” and “EIEE in the work of a modern teacher”. The purpose of the courses was to improve the quality and professional competencies of NEFU academic staff in the field of online training, as well as to increase the share of online courses in training. The courses provided knowledge on technological and methodological foundations of online learning, educational applications implementation, services and their use in professional activities in terms of online learning implementation in a digital educational environment. The course was for 72 hours, part of the classes was planned to be held by means of distance learning technologies.

Introduced training course allows us:

- to familiarize the attendees with modern technologies of online education, cloud services and their application in the professional activity;
- to study a number of educational applications (including mobile) and services, learn how to create educational content using online technologies;
- to analyze the possibilities of webinars as a form of educational activities;
- to introduce the basic rules of safe work and the threats spread by the Internet;
- to organize scientific support for online training and scientific counselling on the topic.

The course involved 125 academic and auxiliary educational staff of NEFU. In addition, an online digital educational platform was designed on LMS Moodle version 2.7. This platform was deployed to the server space of NEFU Pedagogical Institute, which is part of NEFU corporate network. The hardware basis for this platform was the Aquarius server based on Intel Xeon E5620 with 8 GB RAM and pre-installed Windows Server 2008.

It should be noted that the solution of this problem requires relevant conditions to develop a sufficient number of high-quality online courses.

Discussion

Distance learning provides the possibility of involving teachers from different regions in experiencing and developing new technologies in education with the leading experts in the field. Information sharing contributes to the best practices and significantly expands the degree of distribution and implementation in the educational process.

In Russian universities, a theoretical understanding of remote access to learning has allowed us to identify the characteristics of digital education and to determine the students’ digital addiction regarding education.

The authors of this present research emphasize the following gaps and problems in terms of the implementation of remote access to training in distance learning development:

- the lack of personal, direct communication between a student and a teacher;
- the necessity of a number of individual psychological conditions;
- constant control over the students;
- increase in the number of independent tasks;
- the absence of high-quality Internet connection (Most notably with the students from remote, inaccessible villages, as well as the students from the Arctic uluses.).

To solve the above problems, the following recommendations have been developed:

- to improve the training of the personnel involved in the innovation process;

- to provide widespread access to the Internet;
- to conduct various training programs for remote collaboration, students' active acquaintance and communication in groups, online networking, discussion skills improvement on online resources, i.e., chats, social networks, forums;
- to simulate students' educational activity, encouraging them to active cognitive function;
- to develop interactive functionality of online courses;
- to accomplish tasks on time for their successful implementation and to improve the quality of independent work.

Conclusion

Distance learning shows promise, but to provide qualitative education, we must create the conditions needed for entering the exciting world of knowledge.

- To get the best possible results from distance learning the following crucial factors and conditions are needed:
 - The availability of a modern computer and fast Internet access.
 - Actively introduce educational resources and individual experience of distance learning for teachers.
 - Systematic distance learning.
 - Moral and material stimulation of distance activity.

Electronic information and the environment of an educational organization should provide networking interactions between the participants by way of remote consultations and practical assistance via email, forums, blogs, social networks, webinars, cloud services, etc.

It is also worth emphasizing that the forced transition to distance learning during the period of self-isolation allowed each teacher to reconsider their competencies in terms of information and communication technologies. Teachers improved their skills and competencies through self-education of trial and error. They developed a personal system of working in a remote mode and expanded educational opportunities through the implementation of a wide range of electronic digital resources.

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