RESEARCH ARTICLES

Distance Pedagogical Education in the Conditions of the Coronavirus

Educación pedagógica a distancia en las condiciones del coronavirus

Tatyana V. Tretyakova* ID
Ammosov North-Eastern Federal University, Yakutsk, Russian Federation.
ORCID: http://orcid.org/0000-0002-4391-5556

Mikhail S. Prokopiev ID
Ammosov North-Eastern Federal University, Yakutsk, Russian Federation.
ORCID: http://orcid.org/0000-0002-7565-8902

Svetlana V. Goncharova ID
Herzen State Pedagogical University of Russia, Saint Petersburg, Russian Federation.
ORCID: http://orcid.org/0000-0002-6658-9773

Natalya A. Karpova ID
Herzen State Pedagogical University of Russia, Saint Petersburg, Russian Federation.
ORCID: http://orcid.org/0000-0003-2375-1301

Tatyana S. Ilina ID
Herzen State Pedagogical University of Russia, Saint Petersburg, Russian Federation.
ORCID: http://orcid.org/0000-0002-6197-4795

*Correspondence

Email: t.v.tretyakova@rambler.ru

Summary

The relevance of the study is due to the problem of finding optimal solutions for organizing training sessions, the need to form the personality of a teacher in a difficult social and pedagogical situation. The leading research method is a pedagogical experiment on the organization of distance learning for students, the method of theoretical substantiation of the formation of the "Digital Educational Ecosystem" project, the method of practical implementation of the digital environment in work with educational organizations and schoolchildren. This article presents practical solutions for organizing training sessions, pedagogical practices, conducting state final certification through the use of interactive educational platforms, social networks, and instant messengers. An equally significant result of the study is the educational component of the formation of a future teacher in a difficult social situation.

Keywords: Digital Educational Environment; Distance Education; Information and Communication Systems; Educational Online Platforms.

Resumen

La relevancia del estudio se debe al problema de encontrar soluciones óptimas para la organización de las sesiones de formación, la necesidad de formar la personalidad de un docente en una situación social y pedagógica difícil. El método de investigación líder es un experimento pedagógico sobre la organización del aprendizaje a distancia para estudiantes, el método de fundamentación teórica de la formación del proyecto "Ecosistema educativo digital", el método de implementación práctica del entorno digital en el trabajo con organizaciones educativas y escolares. . Este artículo presenta soluciones prácticas para la organización de capacitaciones, prácticas pedagógicas, realización de certificaciones finales estatales mediante el uso de plataformas educativas interactivas, redes sociales y mensajería instantánea. Un resultado igualmente significativo del estudio es el componente educativo de la formación de un futuro maestro en una situación social difícil.

Palabra clave: Entorno Educativo Digital; Educación a Distancia; Sistemas de Información y Comunicación; Plataformas Educativas en Línea.

Introduction

The need to develop distance education in the northern territories, in the authors' opinion, is especially urgent. This is primarily due to the territorial, and indirectly, with the climatic, demographic, and national characteristics of the region. In particular, the uniqueness of the ways of development of distance education is attributable to the fact that the region currently exists: the predominance of rural settlements (89% of the total), located at a fairly large distance from each other (the average distance between ulus centers is 173 km (Mikhailova, 1999); low population density of 0.1 people per 1 sq. Km; lack of sufficient communications in the uluses (weak Internet, interruption of transport links between settlements during freeze-up and thaw, often lasting up to 5 months); c Citizens of over 120 nationalities live in the republic, whose different mentality forms a different stereotype of educational behavior (Neustroev, Savvin, 2009).

Because of the vastness of the territory of the republic and the peculiarities of its transport system, purposeful activity on the development of distance adaptive education for citizens isolated from education in connection with living in places of nomadic people or for citizens with special development opportunities due to illness seems to be especially urgent.

All this gives rise to certain problems in the organization of distance education in real mode, the main of which are the absence or weak Internet, the absence or shortage of qualified personnel capable of providing access and training in the use of distance technologies. Problems requiring a practical solution are mastering the methods and methods of independent work and self-

assessment in conditions of self-isolation, organization of control and evaluation of educational actions, etc.

All this together makes up the socio-cultural space of universities located in the region, the development of which, in turn, is influenced by the geographical location, the degree of migration activity of the population, the expansion of electronic communications, active online interaction with other regions and universities (Terekhov, 2016). The territorial remoteness from the leading university centers of the country, Russia's northernmost North-Eastern Federal University, raises the problem of scientific, methodological, organizational support for distance forms of obtaining basic and additional higher education, timely advanced training to maintain the quality of education in the region, active professional interaction of teachers at different levels education system.

The pandemic of the new coronavirus infection, which also affected the Russian Federation, gave a new powerful impetus to the development of distance learning technologies used in the educational process. The entire educational system in the Russian Federation has switched to the implementation of educational processes in a distance format. The normative act that allowed these processes in the higher education system was the order of the Minister of the Russian Federation.

Material and Methods

The problems of organizing distance education do not lose their relevance in the foreign and Russian system of higher education. The intensification of actions to introduce distance education was influenced by Russia's entry into the Bologna Agreement in 2003 when the opportunities for interaction between Russian educational organizations and other countries expanded. In an article by foreign authors Vaz-Fernandes, P., & Caeiro, S., following the case study methodology, a mixed approach was used based on online student questionnaires on the Moodle platform (learning analytics) to assess student interaction and engagement in e-learning in science education (Vaz-Fernandes, & Caeiro, 2019). Bovermann, K., Weidlich, J., & Bastiaens, T. found significant positive correlations between student readiness for online learning in measuring technical competencies for autonomous motivation (identified and intrinsic). At the same time, progress indicators were positively assessed and accepted as a tool for managing individual learning strategies (Bovermann, Weidlich, & Bastiaens, 2018). Bates, T., a Canadian scholar, presents the results of a national survey of online learning across all public higher education institutions in Canada, conducted by a group of independent Canadian researchers working in collaboration with the Babson Survey Research Group and WCET in the United States, and provides a discussion of the survey results and plans for further research in the future are presented (Bates, 2018). Hossain, Z., Bumbacher, E., Brauneis, A., Diaz, M., Saltarelli, A., Blikstein, P., & Riedel-Kruse, I.H. note that NGSS generation scientific standards require much more sophisticated approaches to STEM -education centered around the integration of sophisticated experiments (including real laboratories, not just simulations), data collection and analysis, modeling and data-driven argumentation and arguing that students can behave like real scientists. This platform and course content are now suitable for large scale adaptation in K-16 formal education (Hossain, Bumbacher, Brauneis, Diaz, Saltarelli, Blikstein, & Riedel-Kruse, 2018). An article by Carraher Wolverton, C., & Guidry Hollier, B. provides an answer to the question of whether a minimalist approach is appropriate in distance learning. The results show that less technology should be used, the training required to teach an online course (Carraher Wolverton, & Guidry Hollier, 2019).

Gegenfurtner, A., & Ebner, C. noted that digital learning environments are becoming increasingly popular in higher education and training. They are especially important for the implementation, delivery, training, and evaluation of educational environments in remote

geographic locations based on the use of common virtual platforms of voice over IP technology and webcam equipment (Gegenfurtner, & Ebner, 2019).

For us, it was important to study the work of the authors of the articles, which provides examples of methods for assessing the readiness of higher education teachers to solve professional problems using e-learning technologies (Akaslan, 2011). They analyze the experience of social cooperation and the possibility of using online tools in e-learning (Imran, Pireva, Dalipi, Kastrati, 2016).

The articles of teachers of the NEFU Pedagogical Institute published in foreign publications reflect that all this creates certain problems in organizing distance education in real mode, the main ones of which are the absence or weak Internet (Barakhsanova, Varlamova, Vlasova, Nikitina, Prokopyev, Myreeva, 2018), lack or shortage of qualified personnel capable of providing access and training in the use of distance technologies (Barakhsanova, Vlasova, Golikov, Prokopyev, Burnachov, Kuzin, 2017). Problems requiring a practical solution are mastering the methods and methods of independent work and self-assessment in conditions of self-isolation, organization of control and evaluation of educational actions, etc. (Barakhsanova, Golikov, Sorochinsky, Lukina, Ilina, Nikitina, 2018). The article "E-learning system application for physical education and sports specialist training" reflects the weak readiness of teachers of physical culture and sports of the Republic of Sakha (Yakutia) to implement e-learning, as well as the lack of scientifically based, tested in practice and widely used educational programs that contribute to the targeted training of physical education teachers for the use of e-learning technologies in their professional activities (Barakhsanov, Barakhsanova, Olesov, Prokopyev, 2018).

All this together makes up the socio-cultural space of universities located in the region, the development of which, in turn, is influenced by the geographical location, the degree of migration activity of the population, the expansion of electronic communications, active online interaction with other regions and universities (Barakhsanova, Sorochinsky, 2016). The territorial remoteness from the leading university centers of the country, Russia's northernmost North-Eastern Federal University, raises the problem of scientific, methodological, organizational support for distance forms of obtaining basic and additional higher education, timely advanced training to maintain the quality of education in the region, active professional interaction of teachers at different levels education system.

In this article, the authors will look at practical solutions to the above problems. Currently, 12 institutes, 6 faculties, and 2 colleges are implementing 461 basic educational programs, including 132 masters, postgraduate, 165 programs of additional professional education. The urgency of the problem of organizing distance education is also dictated by the fact that over 18 thousand students from 42 constituent entities of the Russian Federation and 38 foreign countries study at the university today. Different political, social, personal realities require the use of temporary or permanent modes of distance education for students.

In this article, we consider a certain narrowing of the problem by the field of teacher training in a modern university. In NEFU, the proportion of pedagogical students enrolled in 12 faculties and institutes is about 20% of the total. The range of basic educational programs in the field of "Education and Pedagogical Sciences" includes 106, including 36 master and 9 postgraduate programs. Additional professional-pedagogical education is represented by 94 advanced training programs, including authors, and 28 professional retraining programs.

The emphasis on the need to expand distance learning forms is due to the following factors:

- The increased overall needs of the region in teaching staff and the need to provide teachers in remote settlements;

- The systemic need for timely professional development and implementation of programs of additional professional education for teachers working in remote settlements;
- The need to ensure constitutional rights to receive higher education for citizens with disabilities without leaving home (Constitution of the Russian Federation, 1993);
- The need to develop adaptive professional educational programs for quality education at an individual pace (Chelyshkova, 2001).

Hence the problems that need to be solved in the process of introducing distance education:

- The problem of preparing a motivated applicant for admission to a pedagogical university in conditions of implicit pedagogical communication;
- The problem of ensuring the quality of teacher training in the context of distance education;
- The problem of organizing an independent effective activity of a student in the conditions of self-organization of own activity;
- The problem of objective assessment of the competencies acquired by the student;
- The problem of scientific and organizational support of the educational process following individual educational trajectories with adaptive distance learning;
- The problem of implementing practice-oriented programs and organizing student practice in a distance format.

Certain steps in the development of distance education were made through the study of domestic and world practice of using modern educational technologies (Vlasova, Goncharova, Karpova, Ilina, Barakhsanova, 2019), as a result of which the most actively used in the process of training future teachers were identified:

- Technologies for the development of cognitive activity;
- Information and communication technologies, including distance and online technologies;
- Simulation modeling technologies, including design technologies and case methods (Tretyakova, Savvinov, Ignatiev, 2018).

Results

The distance education system at NEFU is built based on LMS MOODLE through online video conferencing, online webinars, etc. This system is introduced into the general Electronic Information Educational Environment of the University (URL: https://www.s-vfu.ru/stud/about/) and contains all educational programs that are being implemented that make it possible to carry out:

- Distance communication between the teacher and students;
- Training in distance mode through the placement of all educational and methodological documentation, information and training materials for all studied disciplines;
- Feedback in the form of verbal communication, seminars, forums, chats, etc., as well as the performance of assessment test materials, coursework, essays, etc. following the curriculum;
- Current testing of knowledge using an open fund of assessment tools, individual assignments, and the implementation of independent activities of students (Tretyakova, 2010).

Teachers have the opportunity to create electronic courses of disciplines with the necessary educational and methodological content. In standard educational practice, the most appropriate is the use of the "mixed" learning model, during which the educational process integrates classroom training and independent work of students using distance learning technologies (Kondakova, Latypova, 2013). Such educational technologies as dialogues, inverted classrooms, the Internet

of Things, etc., which can be used both in the real educational process and in a distance format, are becoming relevant for use.

The training of future teachers is carried out inseparably from the general education system. Since 2010, the Association "University Educational District" has been functioning in NEFU, which includes 106 educational organizations of the general secondary education system. The University has established a Specialized Educational and Scientific Center (SESC), which implements the educational program of general secondary education. Supervision over the content of the activities of the primary classes of the City National School, functioning within the NEFU, is being conducted. More than 600 schools and kindergartens of the republic, for which professional training of teachers is being conducted, are scattered over the vast territory of the region. Remote technologies are increasingly in demand for constant interaction and professional communications.

The project of the Pedagogical Institute "Digital Educational Ecosystem" offers solutions for such interaction (Tretyakova, 2019). The project is focused on an integral socially significant multi-level system, the participants of which are students and employees of the education system of the republic, represented by all educational organizations of the republic, and involves solving the problem of ensuring a new quality of interaction between participants in the educational process through the implementation of relevant educational programs and improving the quality of educational services to potential customers.
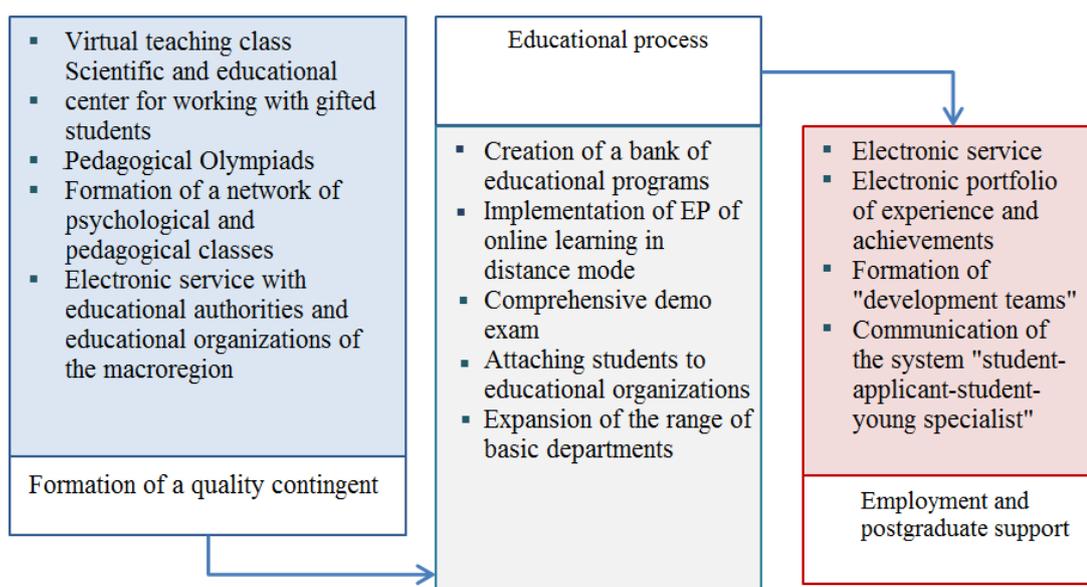
Formation of a quality contingent	Educational process	Employment and postgraduate support
▪ Virtual teaching class ▪ Scientific and educational center for working with gifted students ▪ Pedagogical Olympiads ▪ Formation of a network of psychological and pedagogical classes ▪ Electronic service with educational authorities and educational organizations of the macroregion	▪ Creation of a bank of educational programs ▪ Implementation of EP of online learning in distance mode ▪ Comprehensive demo exam ▪ Attaching students to educational organizations ▪ Expansion of the range of basic departments	▪ Electronic service ▪ Electronic portfolio of experience and achievements ▪ Formation of "development teams" ▪ Communication of the system "student-applicant-student-young specialist"

Figure 1. The content of the activities of a pedagogical university on teacher training, implemented in a digital format

It shows the entire cycle of teacher training, presents the points of interaction of all participants in the educational process, starting from the formation of a contingent of applicants motivated to obtain pedagogical specialties, the development of educational programs and the organization of the educational process, postgraduate support of the pedagogical activity of a young specialist and possible employment. The databases providing the filling of the corresponding sections will be available for the corresponding categories of users and are suitable for use both online and offline. So, prospective applicants and their parents can receive sufficient information both on vocational guidance and on pre-university preparation for teaching the teaching profession.

The digital format should contain the entire range of educational programs implemented by a pedagogical university, and various opportunities for their development, including distance or mixed (with partial use of remote content). The possibility of building a student's educational

trajectory by a pedagogical university will contribute to the implementation of individual career trajectories, using the factors of mobility and network interaction within the region and the country, as well as the possibility of obtaining additional education, organization of scientific research.

Finally, the system involves interaction with employers represented by the Ministry of Education and Science of the Republic of Sakha (Yakutia), educational organizations, placing orders, advertisements and methodological materials, work of forums for communication of colleagues, a website that ensures the operation of the system of continuous professional development, a website - a service for postgraduate support of graduates university and teachers.

The educational process has been completely transferred to distance mode in all areas of educational activity:

1. Lectures have been developed on an online platform, where you can attend classes remotely by connecting to the broadcast in real-time (synchronously) in webinar mode or listening to its recording (asynchronously). Today there are batteries of tests for self-examination during independent work of students, teaching materials with the involvement of scientific publications, monographs, author's textbooks, etc.

This is a contribution to the future, which will be useful in the development of disciplines, implemented in the distance and mixed formats. Ahead is the development of open online courses in the form of video lectures developed for specialized MOOC platforms, which will allow applicants to determine their preferences in terms of professional self-determination, learn more about the leading disciplines that will be taught if they choose this educational program.

2. Online counseling is very important when a student is working independently. Accordingly, the preparation of materials for obtaining consultations also requires the application of additional time and human costs, which, after an appropriate analysis of effectiveness, should be included in the average teaching load of the teacher. This type of distance learning activity is more effective since it is a work with a student in real-time within the framework of an individual curriculum. The project "Digital Educational Ecosystem" involves the introduction of a virtual digital assistant (from the English Virtual Digital Assistant, abbreviated VDA) - a web service and (or) applications for smartphones and PCs (Prokopyev, 2014).

3. The organization of the state final certification of graduates in remote mode should provide all the possibilities for successfully passing exams and defending the final qualifying work. The practice of pre-defense videoconferences held in the mode allows you to be confident in the successful course of the main final events.

4. Control over the course of the educational process and content filling of the internal assessment system is carried out in full using personal accounts in Moodle, e-mails.

In connection with a rather long period of self-isolation, planned work continued to improve the qualifications of teachers in the system of additional professional education in a distance mode. The demanded author's courses were conducted in correspondence and distance formats.

Discussion

The country's education system, within the framework of modernization, optimization of the educational process based on digital technologies, is waiting for decisions on the mass organization of events to improve the qualifications of teachers, aimed at achieving a sufficient

level of digital competencies, automating the placement of educational programs on appropriate sites and their modernization based on modular structuring.

Ensuring the progressive development of a teacher from a schoolchild, a motivated applicant, student, and young teacher, continuous professional communication and growth is possible only when using the capabilities of Internet resources, and digital media. The authors believe that the use of online learning (distance learning) with the use of multimedia and Internet technologies will steadily expand, as it removes the geographical, physical, financial barriers to professional education.

The project the authors propose is a new model for organizing the educational process in a pedagogical university that contributes to the development of the digital infrastructure of education, the formation and development of educational and methodological complexes in an online format. Distance learning provides quite attractive advantages for all participants in the educational process:

- Students get the opportunity to study at a convenient time and in a convenient place, they can determine a convenient pace of learning for themselves;
- Teachers get opportunities for expanded access to students who are for various reasons elsewhere;
- Higher educational establishments get the opportunity to actively implement network forms of interaction with other educational organizations;
- Foreign students get the opportunity to get an education without leaving home.

The force majeure educational situation that arose against the backdrop of the coronavirus infection pandemic put the team in front of the need to organize the educational process in the conditions of an unfinished academic year, the upcoming defense of graduate qualification works, the organization of educational practices, an objective assessment of educational achievements of students in remote access, and procedures for completing the academic year. The previous theoretical substantiation of the formation of a digital educational environment, the presence of an integral electronic information educational environment of the university, progressive practical developments in organizing an inactive environment for communication with sick students contributed to a decent solution to problems.

The following activities were carried out in an accelerated mode:

- Active classes with students were transferred to a distance format;
- Students were allowed to complete the academic year from home, provided methodological assistance and advice on the organization of training and independent work in online mode;
- Provided strengthening of the Internet connection in the student hostel for students who are unable to leave the hostel. The reasons were the inaccessibility of the settlement, the lack of an active Internet, orphans were unable to travel outside the city. All students are provided with electronic means of communication: computers, laptops, tablets, etc.
- Express training of teachers to work with students in a distance mode was carried out;
- Daily emergency mode of consulting on the organization of distance learning was provided;
- Weekly meetings are held on the gradual introduction of the remote completion of the academic year, the adoption of management decisions to ensure the completion of the academic year procedures.

The following information and communication systems have been proposed for use as tools for organizing remote communication (presented in descending order of application activity):

- ZOOM – video conferences provider (http://zoom.us/);

- Webinar – video conferences organizer (http://webinar.ru/);
- Skype – messenger with video conferencing capabilities (https://www.skype.com/.ru/);
- WhatsApp - messenger with video conferencing capabilities for a limited number of users
- YouTube – web service for posting and sharing video messages (https://www.youtube.com/.ru/);
- Proficonf – video conferences organizer (http://proficonf.com/.ru/);
- BigBlueButton – restricted webinar room (https://bigbluebutton.ru/);
- GoogleHangouts – a service for message exchange (https://hangouts.google.com/).

Distance learning, especially at the first stage, required a lot of work on the part of teachers in teaching and methodological support of the educational process, translating materials into digital format. The form of presentation of educational material was changed practically on the fly.

All classes were conducted according to the approved schedule of training sessions, while the difficulty was that not all students could join the class at the specified time. At first, the teachers massively conducted individual additional classes for students at other times. In conditions of poor quality Internet connection, interactive chats, video communications, audio contacts, and e-mail capabilities were used. An analysis of the optimal use of various tools for providing a distance learning format is still ahead.

Conclusion

Thus, in a fairly short period, we have gained invaluable experience in the formation of a digital environment in which the educational process can be organized in different formats (traditional, distance, mixed):

1. A precedent has been created for full immersion in the problem of organizing the educational process in an online format. Completion of the educational process was ensured, the curriculum was completed, all training sessions were conducted according to the educational schedule, and educational documentation was adjusted following the distance learning scenario. The ways of distance passing of educational pedagogical practice by students in online mode are found.

2. Experience has been gained in the online recording of learning outcomes in the appropriate protocols, in maintaining a score-rating system online.

3. The forced period of self-isolation, educational activities in a distance mode made it possible to focus on the social and psychological component of the teaching profession, the formation of competencies of an adequate and independent reaction to emerging pedagogical situations. Any initiatives of students for voluntary volunteer assistance to the population were supported, if possible, corrected by teachers as part of the educational process and read out as a completed educational practice. In general, students completed teaching practice in the course of voluntary volunteer activities.

4. The activity of the Educational and Methodological Center for the organization of additional professional education following popular requests has intensified.

5. The emerging educational situation associated with coronavirus infection and the associated long-term self-isolation regime has intensified the participation of teachers and undergraduates in numerous webinars and advanced training courses on the organization of distance learning, methodological and didactic support of the educational process online.

In general, a large amount of work has been done on the formation of educational and methodological material, correction of educational documentation, and ensuring the completion of the academic year. An effective practical experience has been obtained in using the possibilities of distance (online) learning, which has yet to be comprehended, analyzed, and provided for use in educational practice:

- Firstly, taking into account the experience gained, proposals will be developed to optimize the educational process in terms of transferring many academic disciplines to an online format, educational programs to a blended learning format;
- Secondly, it is necessary to develop scientific and methodological foundations for the organization of the educational process, pedagogical practices in a distance mode;
- Thirdly, there is a lot of work to be done on the formation of educational documentation that ensures the implementation of educational programs in an online format;
- Fourthly, the accumulated experience in providing feedback with students and assessing educational achievements, as well as taking into account the independent work of students, is awaiting analysis.

In general, in the Russian Federation, we believe, the issue of introducing corrections to the content of federal state educational standards (FSES) related to the implementation of educational programs in a distance mode requires reflection. The country's education system, within the framework of modernization, optimization of the educational process based on digital technologies, is waiting for decisions on the mass organization of events to improve the qualifications of teachers, aimed at achieving a sufficient level of digital competencies, automating the placement of educational programs on appropriate sites and their modernization based on modular structuring.

References

Akaslan, Dursun, and Law, E.L.C. (2011). Measuring teachers' readiness for e-learning in higher education institutions associated with the subject of electricity in Turkey. *2011 IEEE Global Engineering Education Conference (EDUCON). IEEE*.

Barakhsanov, V.P., Barakhsanova, E.A., Olesov, N.P., Prokopyev, M.S. (2018). E-learning system application for physical education and sports specialist training. *Theory and Practice of Physical Culture*, *7*, 4.

Barakhsanova, E.A., Golikov, A.I., Sorochinsky, M., Lukina, T., Ilina, E., Nikitina, E.V. (2018). Implementation of the master program "corporate e-learning" in the online interaction of Russian universities. *Espacios*, *39*(20), 36.

Barakhsanova, E.A., Sorochinsky, M.A. (2016). Creation of a network consortium of pedagogical universities as a factor of sustainable development of regional education. *Modern education: traditions and innovations*, *3*, 20-24.

Barakhsanova, E.A., Varlamova, V.A., Vlasova, E.Z., Nikitina, E.V., Prokopiev, M.S., Myreeva, A.N. (2018). Vocational training of school teachers in Yakutia's universities through the principle of regionalization (a case study of the methodology of teaching natural science to prospective teachers). *Espacios*, *39*(20), 35.

Barakhsanova, E.A., Vlasova, E.Z., Golikov, A.I., Prokopiev, M.S., Burnachov, A.E., Kuzin, Z.S. (2017). Peculiarities of quality management of teachers' e-learning training in the arctic regions. *Espacios*, *38*(55).

Bates, T. (2018). The 2017 national survey of online learning in Canadian post-secondary education: Methodology and results. *International Journal of Educational Technology in Higher Education*, *15*(1).

Bovermann, K., Weidlich, J., & Bastiaens, T. (2018). Online learning readiness and attitudes towards gaming in gamified online learning – a mixed-methods case study. *International Journal of Educational Technology in Higher Education, 15*(1).

Carraher Wolverton, C., Guidry Hollier, B.N. (2019). A minimalist design for distance learning. *International Journal of Educational Management*, *33*(7), 1457-1465.

Chelyshkova, M.B. (2001). *Theoretical, methodological and technological foundations of adaptive testing in education*. Abstract of the dissertation for the degree of Doctor of Pedagogical Sciences. St. Petersburg.

Constitution of the Russian Federation. (2014). *As adopted by popular vote on 12.12.1993, taking into account the amendments introduced by the Laws of the Russian Federation on amendments to the Constitution of the Russian Federation of 30.12.2008 N 6-FKZ, as of Dec 30, 2008, N 7-FKZ, as of Feb 05, 2014 N 2- FKZ, as of Jul 21, 2014, N 11-FKZ.*

Gegenfurtner, A., & Ebner, C. (2019). Webinars in higher education and professional training: A meta-analysis and systematic review of randomized controlled trials. *Educational Research Review*, *28*.

Hossain, Z., Bumbacher, E., Brauneis, A., Diaz, M., Saltarelli, A., Blikstein, P., & Riedel-Kruse, I. H. (2018). Design guidelines and empirical case study for scaling authentic inquiry-based science learning via open online courses and interactive biology cloud labs. *International Journal of Artificial Intelligence in Education*, *28*(4), 478-507.

Imran, A.S., Pireva, K., Dalipi, F., Kastrati, Z. (2016). *An Analysis of Social Collaboration and Networking Tools in eLearning*. In: Zaphiris, P., Ioannou, A. (eds). *Learning and Collaboration Technologies. LCT 2016. Lecture Notes in Computer Science, vol 9753*. Cham: Springer.

Kondakova, M.L., Latypova, E.V. (2013). Blended learning: leading educational technologies of our time. *Education Bulletin*, *9*(2759), 54-64.

NEFU electronic information environment. (n.d.). Retieved from: https://www.s-vfu.ru/stud/about/

Neustroev, N.D., Savvin, A.S. (2019). *National traditions of Russian education in the context of the Bologna Process*. Moscow: Academia MMIX.

Prokopiev, M.S. (2014). Design of electronic educational and methodological complexes for academic disciplines of undergraduate vocational training. *European Social Science Journal*, *11-1*(50), 315-321.

Terekhov, P.P. (2016). The role of a modern university in the formation of the socio-cultural space of the region. *Bulletin of the Kazan State University of Culture and Arts*, *3*, 125-128.

Tretyakova, T.V. (2010). *Assessment of the quality of education and its construction in regions with territorial and national characteristics based on the system of complete secondary education in the Republic of Sakha (Yakutia). Thesis abstract for the degree of Doctor of Pedagogical Sciences*. Yakutsk: Ammosov North-Eastern Federal University.

Tretyakova, T.V. (2019). *The concept of the development of teacher education in the North-Eastern Federal University*. Yakutsk: North-Eastern Federal University.

Tretyakova, T.V. (2019). *The concept of the development of teacher education in the North-Eastern Federal University*. Yakutsk: North-Eastern Federal University.

Tretyakova, T.V., Savvinov, V.M., Ignatiev, V.P. (2016). The influence of the socio-cultural space of the university on the quality of teacher training. *Modern problems of science and education*, *6*, 245.

Vaz-Fernandes, P., & Caeiro, S. (2019). Students' perceptions of food safety and quality e-learning course: A CASE study for an MSC in food consumption. *International Journal of Educational Technology in Higher Education*, *16*(1)

Vlasova, E.Z., Goncharova, S.V., Karpova, N.A., Ilina, T.S., Barakhsanova, E.A. (2019). Artificial intelligence for effective professional training of teachers in the Russian Federation. *Espacios*, *40*(22).