

# Peculiarities of quality management of teachers' e-learning training in the Arctic regions

## Peculiaridades de la gestión de la calidad de la formación del "docente e-learning" en las regiones árticas

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#### ABSTRACT:

The article presents the long-term work experience of two Russian universities, which was related to the theory and practice of the development and practical implementation of educational programs for masters training for organization and implementation of e-learning for schoolchildren in the northern regions. It demonstrates that the use of joint research, educational, and resource potential of universities with the simultaneous participation of employers provides modern innovative education for teachers, adapts their training to the requirements of the region.

**Keywords:** Quality training, education management, quality assurance, e-learning, teacher training

#### RESUMEN:

El artículo presenta la experiencia laboral a largo plazo de dos universidades rusas, relacionada con la teoría y práctica del desarrollo y la implementación práctica de programas educativos para la formación de maestros para la organización y aplicación de e-Learning para escolares en las regiones del norte. Demuestra que el uso de la investigación conjunta, educativa y potencial de recursos de las universidades con la participación simultánea de los empleadores proporciona una educación innovadora moderna para los docentes, adapta su formación a las necesidades de la región.

**Palabras clave:** formación de calidad, gestión educativa, aseguramiento de la calidad, e-learning, formación docente

## 1. Introduction

The problem of quality management in personnel training for the Arctic region is the subject of

discussion at the highest-level forums, where the innovative development of the Arctic regions is noted to make training of specialists with higher education especially appropriate to specific conditions of work, study and life in the Arctic region. The problem of managing the quality of education is one of the most relevant for any school, for every principal and a teacher.

Considering the issues of the quality of education, we rely on a number of basic concepts: quality, quality assurance, education, quality education management, quality improvement. Quality is a set of characteristics of an object relating to its ability to meet established and anticipated needs. Quality assurance includes all planned and ongoing activities that are available for ongoing monitoring and are necessary to create confidence in meeting quality requirements. Education is a purposeful socialization of the individual, ensuring the students' mastering of cultural patterns and values, the formation of the image of one's own self, based on the systematized knowledge and skills, as well as the experience of an emotional attitude to the world. Quality education management is a regularly implemented system of strategic and operational actions aimed at providing, improving, monitoring and evaluating the quality of education.

The professional identity of teachers is formed in the context of the growing processes of modernization and crisis phenomena. This makes it necessary to constantly improve teachers' training, upgrading their skills in accordance with the requirements of modern socio-cultural, regional reality and the needs of a new generation of students. In general, there is the urgent necessity to resolve contradictions between:

- dynamics of teachers' professional growth and the nature of the socio-cultural and regional situation of their activities
- the existing creative potential of the teacher's personality and the possibility of its practical implementation in the conditions of the electronic information and educational environment;
- students and their parents' educational demands and the teacher's professional level;
- the need to organize the educational process in the electronic information and educational environment applying the methods and technologies of e-learning and lack of motivation, knowledge and skills for the implementation of this new professional activity [Barakhsanova et al., 2016, Vlasova, Gossoudarev, & Aksytin, 2014, Vlasova, 2001, Grigorieva, Barakhsanova, & Mordovian, 2011, Nikolaeva, Golikov, & Barakhsanova, 2014].

Modern innovative training of teachers, based on the cooperative participation of universities in the development of specialized adaptive educational programs and e-learning technologies training, the formation of innovative technological infrastructure of the education system in the regions, taking into account their territorial, natural-climatic, socio-cultural and other characteristics, can largely contribute to the resolution of these and other contradictions [Vlasova, Gossoudarev, & Aksytin, 2014, Vlasova, 2001].

Researchers are interested in the use of e-learning in higher education (Gaebel et al., 2014), in the development and implementation of adaptive technologies for training specialists, including teachers (Skoulikari, Tsakalidis, & Tsolis, 2015, Chen et al., 2016). Their articles deal with the implementation of e-learning systems that support personal-oriented and adaptive learning, including courses available through mobile environments and devices. In a number of works, there is discussion of various aspects of teacher training for professional work in the context of the growing inverted and all-pervasive learning (Chen et al., 2016), changes in the nature of the pedagogical need for innovative electronic informational and educational environments (Schulz, Ghislain, & Reichert, 2014), with strengthening of the economic, market factor in motivation of educational activity (Clark, & Mayer, 2016) and taking into account the evolution of interactions between educators and students (Mohammad et al., 2013). The authors of the articles give examples of methods for assessing the readiness of teachers of higher educational institutions to solve professional problems implementing e-learning technologies (Akaslan & Law, 2011).

Nevertheless, it should be noted that in the works under analysis, the problem of training

teachers in the Arctic regions to use e-learning technologies in professional activity is not adequately addressed.

## **1.1. Goals and hypothesis**

The aim of the study is to develop the theoretical and practical framework for training future teachers in the Arctic regions to use e-learning in their professional activities on the basis of generalizing the joint work of universities in Russia and beyond, on the development of scientific and educational activities in the Arctic. The research was carried out by a team of authors who are representatives of various regions of Russia (St. Petersburg and the Republic of Sakha (Yakutia).) This allows cooperative use of the innovation, personnel and resource potential of universities to solve the problem of qualitative and effective training of education specialists in e-learning, identifying potential risks and specific features of this new type of training in the Arctic zone.

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## **2. Methodology**

The study was carried out within the framework of a systematic approach to teacher training in the Arctic region for work in e-learning environment (Vlasova, Gossoudarev, & Aksytin, 2014, Vlasova, 2001). Adaptive master's educational programs have been developed to ensure effective teacher training to use e-learning in the North. The ideas underpinning the work are those of interdisciplinarity, adaptation, deepening of cooperation between universities and the competence approach.

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## **3. Results**

Modern educational institutions position themselves in the market of educational services through their own educational and professional identity, justifying their relevance and effectiveness of the educational system they offer. The activities of educational institutions must meet the challenges of the current situation, increasing competition in the market of educational services. To reduce risks, as well as to sustainably develop them, it is advisable to consolidate the efforts of educational institutions. The combination of methodological, educational and innovative potentials allows implementing joint projects, providing professional mobility, working in accordance with modern qualification requirements. This involves solving a wide range of professional tasks in the electronic information and educational environment and, as a result, the use of a new type of training – e-learning. A particularly high degree of demand for e-learning is characteristic of the educational system in the northern regions of the Russian Federation, for example the Republic of Sakha (Yakutia), with its considerable distances between settlements and educational institutions, as well as the current specific nationally-conditioned system of nomadic schools. The Law on Education of the Republic of Sakha and the Law "On Nomadic Schools of the Republic of Sakha (Yakutia)" notes the feasibility of implementing educational programs in these schools using networked distributed form and distance educational technologies.

In the North-Eastern Federal University, teachers' training is a priority in the educational activities of the university. In recent years, pedagogical education has undergone significant changes related to training of teachers of the new formation, capable of creatively updating the content and means of pedagogical activity, creating the necessary conditions for the development of children, their talents and abilities. In this regard, in order to provide a qualitative new level of teacher training for the new school, it is necessary to analyze the capabilities of the federal university in this process, identify points of growth and priorities for the modernization of the educational process and research activities, the content of available resources in the context of e-learning in Russia [Grigorieva, Barakhsanova, & Mordovian, 2011].

In addition, it should be emphasized that the organization of training in remote circumpolar

regions requires the implementation of an innovative nomadic e-learning model that takes into account the following peculiarities: the nomadic way of life and the national traditions of the indigenous peoples of the North; territorial remoteness of educational institutions; telecommunication technologies used for remote learning; socio-psychological platform for the implementation of educational programs [Grigorieva, Barakhsanova, & Mordovian, 2011, Nikolaeva, Golikov, & Barakhsanova, 2014].

The introduction of this model, in turn, necessitates the appropriate training and retraining of teaching staff. Among them are teachers involved in the educational process of nomad schools and teachers of higher education who prepare them for this professional activity. At the present stage, unfortunately, the willingness of both teachers of schools and higher school teachers to implement e-learning, taking into account the regional specifics of the Arctic regions, continues to be insufficient.

During the research, a test of the need to introduce e-learning into the educational process in schools in the Arctic regions was conducted. Students from a pedagogical university (S), already working teachers (AET), trained in the field of e-learning and working teachers who were not trained in e-learning (A), were tested. They got the following points: S: 7, 5, 5, 1, 0, 3, 0, 1, 0, 0, 1; AET: 5, 4, 1, 2, 1, 3, 3, 5, 3, 2, 1; A: 9, 0, 0, 0, 0, 0, 2, 3, 1, 2, 4.

The question was as follows: the opinion of which group of teachers most coincides with the students' point of view. The students' opinions and those of working teachers, trained in the field of e-learning, on the one hand, and students' points of view with those of working teachers not trained in e-learning, on the other hand, were compared. The comparison was made using the t-Student test. The mean values of the opinions of all groups of respondents were calculated.

The average value of students' opinions is  $X_{1avr} = 2.09$ .

The average value of the opinions of working teachers trained in the field of e-learning  $X_{2avr} = 2,727$ .

The average value of the opinions of working teachers not trained in the field of e-learning  $X_{3avr} = 1.91$ .

Based on an analysis of the mean values of all respondents' opinions, the following hypotheses were formulated:

H0: The student's opinion does not differ from that of the teachers of both groups.

H1: The student's opinion is closer to the opinion of working teachers not trained in the field of e-learning.

Next, two empirical values of the t-Student criterion were calculated by comparing the opinions of students and working teachers trained in e-learning and of students and working teachers not trained in e-learning. They are respectively equal to:

$$t_{1,2} = 0.724 \quad t_{1,3} = 0.16.$$

For further calculations, the number of degrees of freedom was determined:  $n = 11 + 11 - 2 = 20$ .

According to the t-Student test table, critical values have been calculated:

$$T_{cr} = 2.09 (\alpha \leq 0,05) \quad \text{and} \quad t_{cr} = 2.84 (\alpha \leq .001).$$

Further, the values of  $t_{1,2}$  and  $t_{1,3}$  were compared with  $t_{cr}$ . It can be seen from the comparison that  $t_{cr} > t_{1,2} = 2.84$  and

$T_{cr} > t_{1,3} = 0.16$ . This means that the hypothesis H0 is confirmed, that is, the students' opinion does not differ from the opinion of the teachers of both groups.

Realizing the acute need for teachers who are ready for professional work in the new pedagogical conditions, in conditions of e-learning, the Herzen RSPU (Department of Computer

Technologies and E-learning) and the Pedagogical Institute at the Ammosov NEFU (the Republic of Sakha (Yakutia)) developed and implemented two master's educational programs in the practice of training teachers for the Arctic regions of Russia: Technologies and Management of E-learning and Corporate E-learning. Universities carried out jointly training of students according to these educational programs. What is more, the program Corporate E-learning is a networked master's program.

In the process of work, special attention was paid to the design and implementation of models for organizing students and teachers' work using e-learning technologies; to integration of e-learning technologies and electronic educational and methodical complexes into the educational process of educational organizations; to the development of interactive e-learning educational resources for corporate e-learning; to methods of evaluation, reasonable selection and use of tools and means to organize e-learning in the implementation of educational and personnel qualification development programs; to the use of e-learning technologies in the teaching disciplines of various cycles and extracurricular activities.

The results revealed that the use of e-learning allows universities to organize the educational process more dynamically, efficiently, readily, using various new options of pedagogical interaction between subjects of the educational process. In addition, the process of knowledge exchange is more intensive, the process of obtaining knowledge for the students is actualized, and, what is important for solving the problem of optimization of educational institutions, the level of costs associated with conducting face-to-face classes is reduced. E-learning is based on the use of a wide variety of technologies and e-learning solutions. Their use provides the universities with the opportunity to solve a number of topical organizational, pedagogical and methodological problems of vocational education, such as: to expand the range of educational services provided and, as a result, to expand the audience of trainees; to reduce the classroom teaching load of both students and teachers; to ensure the availability of educational content and its prompt delivery to trainees; to provide more effective and timely updating of educational material; to ensure the continuity of students' education due to the absence of spatial and temporal restrictions; to expand the options for interaction between teachers and students; to expand the options for interaction between universities; to improve (optimize) the conditions for the organization and conduct of the educational process; to broaden the opportunities for professional growth and professional development of university teachers, including the opportunity to quickly learn the colleagues' experience, communicate with them and conduct joint work; to perform promptly intermediate and final assessment, using testing and assessment materials of various formats, as well as dynamic monitoring of students' knowledge; to provide a personal work schedule for students at various stages of the educational process; to use a wide range of electronic educational resources of various functional purposes actively at various stages of the educational process; to train future educators to use a wide range of e-learning technologies and solutions not only in their professional activities, but also apply them to work in the pedagogical community, including the organization of school teachers' corporate training for the use of e-learning and its elements.

For the implementation of master's programs, the teachers of the departments of the cooperating universities established electronic training courses reflecting their scientific and methodological potential. The Department of Computer Technologies and E-learning at the Herzen RSPU has developed e-learning courses specifically for students of the Pedagogical Institute at the Ammosov NEFU to teach a number of subjects using distance education technologies. These are: Information Technologies in the Study of Foreign Languages, E-learning Solutions for Knowledge Management in Educational Institutions, Organization and Models of Corporate Training, Internet Studies. The mentioned courses are placed at the distance learning system Yakutsk Global University Ammosov NEFU (<http://yagu.s-vfu.ru/>) and were used during the classes by teachers from St. Petersburg for students from Yakutsk [Barakhsanova et al., 2016, Vlasova, Gossoudarev, & Aksytin, 2014, Vlasova, 2001, Nikolaeva, Golikov, & Barakhsanova, 2014, Prokopiev, 2015].

The joint work of the universities was not limited only to conducting classes for students. Various models of work have been used both with students and with teachers. Joint scientific and practical conferences, webinars and master classes were held, the topics and content of which are relevant for the implemented master's programs. The publication activity of the teaching staff of the departments at the partner universities implementing the educational program has increased. Teachers published a number of joint articles (in domestic and foreign periodicals) devoted to training of future and current specialists in the education in Sakha (Yakutia) in the conditions of the electronic information and educational environment and using e-learning in their professional activities. Masters of the Herzen RSPU (St. Petersburg) and Ammosov NEFU (Yakutsk) completed and are performing master's theses, relevant to the education system of the Arctic regions of the Sakha Republic (Yakutia), as well as for students' training at the Institute of the North of the Herzen RSPU. Currently, two master's theses are being prepared, the results of which (in the form of ready-to-use electronic training courses in the distance learning system at the Herzen State Pedagogical University) will be used in teaching the subject Use of Electronic Educational Resources for Studying National and Cultural Traditions of the North, including the application of distance educational technologies. They are a logical continuation of the previously performed work Cultural Heritage of Yakutia (this electronic educational resource is available on the portal of the Department of Computer Technologies and Electronic Learning of the Herzen Russian State Pedagogical University at <http://ict.herzen.spb.ru/department/Raz/>). Its mobile version was developed for operational work in remote areas [Vlasova, Gossoudarev, & Aksytin, 2014, Vlasova, 2001].

When implementing the networked master's program, it was possible to use the multi-platform software and software that is relevant specifically to a particular group of students. This made the program more universal and allowed applying it to work with a wide audience.

When implementing the networked master's program Corporate E-learning, with the purpose of its effective usage, teachers at the Herzen RSPU conducted advanced training of the teaching staff of the Pedagogical Institute at the Ammosov NEFU according to the program E-learning Technologies in the Implementation of Educational Programs in Higher Education, developed by teachers of the Department of Computer Technologies and E-learning. Advanced training according to the program Information Technologies and E-learning in Teaching School Subjects was organized and conducted on the basis of the Herzen RSPU for a group of teachers of Yakutia, already working. This allowed the operative implementation of modern methods for e-learning in the work of the teachers in the Arctic region. An interesting experience of the joint work of the teachers at the Herzen RSPU and the Ammosov NEFU was received during the training held in the Palace of Children Creativity in the city of Yakutsk. Teachers and their students studied together. They learned to use information technologies and e-learning technologies in project activities. The executed projects were devoted to the cultural heritage and nature of the Republic of Sakha (Yakutia).

It should be noted that the increase in the resource base in the sphere of education is still ahead of the penetration of e-learning into the teaching practice. At the same time, the speed of updating electronic resources with the support of information technology is rapidly outpacing the time to achieve a significant effect on their use in schools and universities. Accounting for the relationship between resource implementation based on the use of modern technologies in the educational process at the university and changes in the professional qualities of teachers are the main conditions for the introduction of e-learning in the field of education.

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## **4. Conclusions**

The most effective form of training, retraining, advanced training of teachers in modern conditions is the development and implementation of corporate training programs focused on the needs of a particular educational institution. It gives an opportunity to improve not only the quality of teacher's work, but also the quality of management. Due to upgrading teachers' qualifications at a particular educational institution, the effectiveness of intra-group, intra-team

relations is enhanced, a common intra-corporate language, mutual understanding and coherence in the work are formed. Taking into account the geographical peculiarities of Russia, its large dimensions and the distribution of educational institutions both in the country and within certain regions, it is urgent, expedient and timely to train pedagogical staff not only in accordance with the idea of corporatism, but also in accordance with the idea of using a fundamentally new type of training – E-learning. The solution of this problem requires qualified specialists in the field of corporate e-learning. In this connection, the authors of the article developed the educational program for the master's training Corporate E-learning. The program has a multifunctional orientation and is focused on training the future leader, the organizer of e-learning in an educational institution or other establishment, and a specialist who directly conducts corporate e-learning. Also, it is focused on the fact that students in master's programs will acquire the methods of management; develop skills of independent search and decision-making on the basis of broad interdisciplinary and systematized knowledge relevant to modern education. The program is intended for individuals who are directly involved in the development of e-learning, corporate e-learning in Russia, in its Arctic regions. During the training, examples and cases from the practice of educational institutions and companies in the Russian market are used.

The program has a practical focus, is implemented using e-learning technologies and the didactic potential of the electronic information and educational environment, the adoption of educational e-learning solutions. In the process of teaching, modern methods of e-learning and electronic educational and methodological materials are applied as well as business games based on specific educational situations from the practice of international and Russian education. The activity-competence approach and project and role-playing method are implemented in teaching in order to form analytical, behavioral and organizational competencies; advanced level case-study and independent and project work in the mode of e-learning and team teaching is used as well. The practice is to hold round table discussions, using webinars and videoconferencing technologies; master classes conducted by leading experts in the field of electronic and smart education, innovative development and education management.

The program provides for the possibility of training in a modular mode and the creation of a range of special courses that take into account the educational needs of the directing educational institution or organization.

Disciplines of the curriculum cover the main functional areas of corporate e-learning and ensure the high integration of certain subjects from the perspective of both general management of corporate e-learning and its direct implementation. The curriculum includes disciplines of integrative, interdisciplinary nature in the field of education, pedagogy, psychology, e-learning, organizational restructuring and innovation in teaching, which allow graduate students to develop interdisciplinary knowledge. These are such subjects as: Organization and Models of Corporate Training, Management of IT Projects for Corporate Training, Knowledge Management in Educational Institutions, Methods and tools of Corporate E-learning, Distance Education Technologies in Corporate Learning, Cloud Technologies in Corporate Training, Smart Learning Methodology and Technologies, Mobile Corporate Training, etc. In the process of training, graduates must acquire the theoretical knowledge, skills and practical skills necessary for the overall management and practical implementation of corporate e-learning, both in terms of innovative options for organizing modern educational process, and particularly in the field of e-learning, including its specificity for corporate training of teaching staff.

Further development of work may be related to elaborating programs for the use of e-learning for professional upgrading of teachers in the Arctic regions.

The results of the research are of interest to a wide range of specialists in the field of education, expand the understanding of the formation of innovative network models of teacher training with the focus on the use of e-learning.

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