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Improvement of remote professional training of students of pedagogical specialties

Larissa Semenova*

PhD in Pedagogy, Associate Professor

Innovative University of Eurasia

140000, 45 Lomov Str., Pavlodar, Republic of Kazakhstan

<https://orcid.org/0009-0008-8468-0221>

Anastassiya Kazantseva

Senior Lecturer

Innovative University of Eurasia

140000, 45 Lomov Str., Pavlodar, Republic of Kazakhstan

<https://orcid.org/0000-0002-5449-0610>

Gulmira Suleimenova

PhD in Pedagogy, Senior Lecturer

Pavlodar Pedagogical University

140000, 60 Olzhabai Batyr Str., Pavlodar, Republic of Kazakhstan

<https://orcid.org/0000-0003-4975-6557>

Bagzhanat Kairbekova

Doctor in Pedagogy, Professor

Innovative University of Eurasia

140000, 45 Lomov Str., Pavlodar, Republic of Kazakhstan

<https://orcid.org/0000-0001-6460-4645>

Klara Sadirbaeva

Master of Science, Deputy Director

Kazakh National Cultural Center of Uzbekistan

100000, 20 Niyozbek Yuli 6th Drive, Tashkent, Republic of Uzbekistan

<https://orcid.org/0000-0002-8301-2810>

Abstract

Relevance. The emergence and spread of the COVID-19 pandemic changed the activities of established social institutions. The introduction of quarantine restrictions caused a mandatory transition to remote studies in educational institutions of all forms and types. Such changes affected the competence of teachers, which did not meet the challenges of today.

Purpose. The aim of the study is to research ways to improve the quality of education of future teachers in the conditions of remote studies.

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*Corresponding author



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Methodology. To achieve this goal, the methods of analysis and synthesis, deduction, abstraction and generalization were used.

Results. As a result, it was established that the introduction of remote studies has become a new approach for the Kazakh educational environment. This determined the need to compare the elements of in-class and remote studies in order to develop an effective model of modern online education. As a result, the main differences between the two types of the educational process were determined. On the basis of this, the features of teacher training for their performance of pedagogical tasks in the conditions of online education are described. Thus, the aspects that must be taken into account during the educational and professional training of the future teacher in the conditions of distance learning are characterized.

Conclusions. The obtained results can be used during the development of online courses and educational programs to increase the level of competence of student teachers in the course of remote professional activity.

Keywords: online class; pandemic; learning under quarantine; teaching; competence.

Introduction

The spread of the coronavirus disease in the world has caused changes in the educational environment. They consisted in the transition from face-to-face to distance education. Such a step was necessary to prevent the spread of the disease and comply with quarantine restrictions. The transition to the distance form led to a number of significant changes in the educational process, in particular, computer and digital technology skills became mandatory for all subjects of educational activity [1, 2].

In addition, the introduction of online learning has actually changed reality, turning education into a separate global environment. It should be noted that international features were characteristic of education even before the beginning of the pandemic, in particular, since the beginning of the 21st century. However, the introduction of quarantine restrictions has further increased the popularity of distance education in various educational institutions. The online approach has become a common interest for all societies, expanding access to various educational forms and activities [3-5]. Changes in the basic principles of the organization and implementation of the educational process have complicated pedagogical work, which has increased the urgency of teacher retraining. The issue of improving the quality of educational and professional training of future teachers has become especially widespread. This is due to the change in the teacher's tasks in the modern educational environment. Therefore, it is advisable to study priority approaches, based on which it is possible to ensure systematic training of future teachers for interaction and use of digital technologies.

This question has been actively investigated in scientific doctrine during the last three years. Thus, it is possible to identify different approaches to the role and tasks of a modern teacher, as well as the peculiarities of their professional training. S.I. Lei & A.S.I. So [6], and A. Yates *et al.* [7] studied statistical data on the effectiveness of distance education. According to them, during online learning, students can remember 25-60% more material, while during in-class studies, only 8-10% was possible to comprehend. Such a conclusion is important for determining the advantages of a distance approach to the implementation of the

educational process. G.K. Kamieva & L.M. Orazgalieva [8] also believe that e-learning is more effective than its traditional form. They claim that online studies require 40-60% less time, as students can independently determine the pace and order of studying the educational material. The described position can be applied when studying the features of online studies, the role of the student and the teacher in it. Special attention should be paid to the works of Zh. Zhumatayeva *et al.* [9], and R. Capone & M. Lepore [10], who investigated the tools of cooperation and interaction of the subjects of the educational process. In their opinion, to improve the emotional contact between the teacher and the student, it is important to use not only digital mechanisms and programs, but also psychological principles. The obtained conclusion should be used when describing the approaches and means of distance education implementation by future teachers.

Given the above, the goal of the scientific work was to research ways to improve the quality of educational and professional training of future specialists in pedagogical specialties. For this, the following tasks were defined: to carry out a comparative analysis of in-class and online studies; to consider the methods used by teachers during online lectures; to characterize the main problems of teacher preparation for remote studies classes; to describe the contemporary structure of the educational environment; to determine the role of skills in using digital technologies in pedagogical activities.

Materials and Methods

The method of analysis in scientific research was used to divide its object into constituent elements. Based on this methodology, parts of the educational process were considered, taking into account normal and quarantine conditions. The method of analysis was necessary for the study and assessment of methods, forms, and means of remote studying. The synthesis method was used to combine the elements separated during the analysis. Such an approach was necessary for studying the general features of distance learning, highlighting certain aspects in the training of future teachers. The synthesis provided for the combination of

various elements of the educational process to form a single scheme of the modern educational environment.

The comparison method was used to compare different elements of online learning activities. This technique was implemented on the basis of such parameters as motivation to study, constructive communication, communicative conditions. The comparison involved the assessment of a specific object based on several forms of information about it. This method was used to obtain secondary information, the source of which was the processing of primary data. On its basis, the common and distinctive features of various forms of education were established, as well as the model of the organization of distance education at the university was formed. This method was used for comparative analysis. The features of conducting a lecture when the student has a stable connection to the Internet and vice versa are analyzed. Also, on its basis, the advantages and disadvantages of classroom and distance education are determined.

The method of deduction was necessary to express individual elements based on knowledge of general ones. Accordingly, the peculiarities of the presentation of educational material during remote learning through the general understanding of distance education were investigated. This method was necessary to highlight the peculiarities of the implementation of pedagogical activity in a remote form.

The method of abstraction involved studying the features of distance education. This method was used to identify the peculiarities of the implementation of pedagogical tasks during remote interaction with students. The generalization method was used to establish mechanisms and approaches aimed at improving the quality of educational and professional training of future teachers. Generalization made it possible to combine the features of training future teachers and teaching educational information during online studies through the use of special digital tools.

Results

As a result of the outbreak of the pandemic, the education system underwent changes that necessitated the search for effective ways to ensure the continuous operation of educational institutions, taking into account quarantine restrictions. The priority was the introduction of online learning. This explains the need for special training of teachers so that the organization of the educational process in remote mode is high-quality and effective. To reveal the specifics of the competence of teachers in the conditions of distance work, it is advisable to consider the general components of the educational environment in face-to-face and distance forms of education [11].

Both forms of the educational process involve high-quality interaction between the teacher and the student. The choice of methods and forms of interaction depends on the goals and objectives of the educational environment. Remote and in-class education should be compared according to the following criteria: motivation to study; constructive communication; communicative conditions. As for the first category, in

the conditions of in-class training with a teacher, there are more opportunities for verbal influence on the student, in order to increase the level of their internal and external motivation. In the course of online studies, on the contrary, certain difficulties arise that complicate the process of forming the student's internal motivation [12-14]. This process is due to the lack of personal contact between the subjects of the educational environment. As for constructive communication, during traditional education, the teacher can choose the way of organizing educational activities from a wide range of methods (for example, work in groups, pairs, several individuals, discussion). In this way, the teacher can control the performance of tasks by students. Meanwhile, the full-time form of education is limited by the schedule and number of study hours. Online form of education also provides subjects of educational activity with a wide range of methods of organizing the educational process and interaction between them. The disadvantage of this approach is limited access, the possibility of technical failures, unstable Internet connection of students or teachers. Special attention should be paid to communicative learning conditions. Accordingly, during in-class studies, personal contact between the student and the teacher is established. This is explained by the fact that both can express emotions, intonation, gestures, thereby improving social communication skills in everyday life. Despite the fact that distance learning excludes the possibility of personal contact, it can be implemented with the help of online interaction of various subjects, in particular, using technical means [15; 16].

Based on the above, it can be said that online studying is characterized by certain features, which influence planning and the teacher's preparation for the organization of educational activities. Accordingly, during the development of the structure of online studying, the teacher must take into account some factors. In particular, preparation for the educational process should be carried out according to a certain algorithm, which consists in dividing it into separate sections. This will make it possible to provide educational information gradually, given the requirements of the educational program. Also, the teacher must analyze the questions of the lecture in such a way so they can answer additional questions of the students as the case may be. In the process of online studying, the teacher needs to rely on interdisciplinary connections so that the student can use already acquired knowledge, including that from other disciplines [17-19]. Since conducting an online lecture involves providing the student with a large volume of material for independent study, the teacher must formulate and explain the information clearly, unambiguously, and succinctly. It is important to carry out measures to generalize the studied material so that the teacher can identify the difficulties of the students in the course of mastering the educational topic [20].

It should be understood that not only students, but also teachers face difficulties during online studying. Accordingly, the latter should consider the fact that not

all students may have access to the Internet during online lectures. This necessitates the organization of additional work with such persons, for example, through communication by e-mail, messengers, and the provision of media files.

To ensure the functioning of a normal educational environment in remote mode, the teacher must take

into account both options, when the student has uninterrupted access to the network and when they do not. Therefore, it is necessary to describe the methods on the basis of which the teacher's work during an online lecture is possible (Table 1).

Table 1. Professional qualities of MA students (teachers) in conditions of multilingual education

Lecture category	Student has access to the network	Network access is unstable
First lecture	The teacher develops a plan and algorithm for the implementation of the educational course. The student attendance of lectures is considered. The teacher gives these documents an open access on a designated online platform. To establish the current level of students' knowledge, they should prepare a number of general questions from previous courses.	The teacher forms a plan with the requirements and features of their course. This algorithm is placed on servers with open access, so that students can find it. Students receive a list of questions related to previous educational topics. They provide answers through offline consultations and also send them via email for teacher's review.
Information lecture	This type of lecture should be conducted using ZOOM conferences for the demonstration of media materials. It is also possible to organize a film demonstration, then discuss the problematic questions. It should be a short video of 10-15 minutes.	The lecture can be given in the form of a text or a presentation. In addition, questions should be formed for the teacher to check the effectiveness of students' comprehension of the material. The student independently processes the provided educational information.
Summarizing lecture	It is worth preparing a video lecture, due to the use of the PowerPoint program. The teacher needs to review the most difficult topics that students have studied for several weeks. The slide show should last about 10 minutes. Subsequently, it is worth holding a discussion, for consideration of each educational topic, on one problematic question.	This lecture should be developed in the form of a slide show with narration in the PowerPoint program. The teacher needs to review the most difficult topics that students have studied for several weeks. The slideshow should last about 10 minutes. Subsequently, it is worth holding a discussion, for consideration of each educational topic, on one problematic question. As a result, a number of questions are formed according to the number of educational topics studied during the semester.
Lecture-conference	Students need to independently review the lecture materials and write several questions. The teacher in turn gives answers during the class. It is also possible to conduct this lecture in the following way: give students time (10 minutes) to prepare questions directly during the class. After that, the teacher must answer these questions.	The student needs to independently analyze the text of the lecture and formulate 10-15 questions based on it. This will allow the teacher to see that the student has processed the material provided to them. It is also possible to offer students to write at least 5 questions for each question of the lecture.
Binary lecture	Such a lecture should be held in ZOOM conference mode. This will allow for attracting teachers from other cities or countries, specialists from other fields. After listening to the material, students can ask clarifying questions to lecturers.	It is appropriate to record a video of this lecture, with additional questions. Students must provide answers and send them to the teacher.

Source: compiled by the authors

To implement the approaches described above, it is advisable to use various programs, such as ZOOM, Skype, WhatsApp, PowerPoint, Prezi, which differ in purpose [21]. Separately, it is necessary to emphasize the need for the teacher to receive feedback from the

students. This process is mandatory, as it allows for identifying problems during students' mastery of academic disciplines or individual issues. It is important that feedback comes from both students who are able connect to the conference and those who do

not have access to the Internet. For this, the teacher needs to carry out a clear planning and organize an educational process in which all students will be able to participate. It is advisable to organize an open dialogue or discussions, during which the teacher and students can discuss the most difficult topics from the lecture or other educational material. This will prevent gaps in

students' learning even remotely. Based on this, it can be argued that the preparation and organization of remote classes is a more time-consuming process, in contrast to the traditional in-class lectures.

In the process of preparing a teacher for an online lecture, some difficulties may arise. Based on them, a diagram was developed (Figure 1).

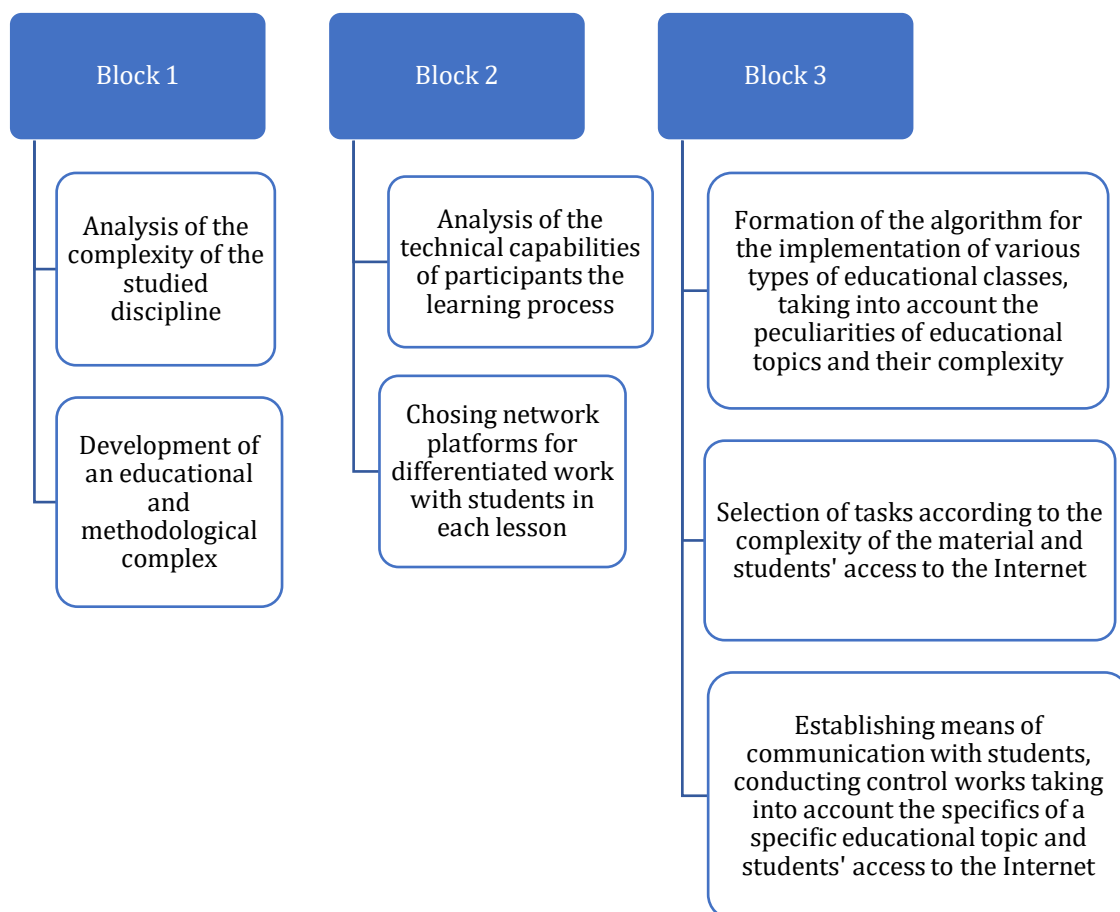


Figure 1. Model of the organization of distance learning in higher education

Source: compiled by the authors

One of the main features of online studying is the lack of direct contact between teachers and students. This determines a certain specificity of the organization of educational work, for example, it is necessary to choose technical mechanisms for the implementation of communication. Given the above, in particular with regard to the specifics of the teacher-student contact during online studying, it should be noted that digital technologies are becoming mandatory for use. In addition to the substantive part of the study of the educational topic, it is necessary to take into account the technical part. Based on this, the modern structure of training is presented in the form (1):

$$TO + EA + C = R, \quad (1)$$

where, *TO* is the organization of training, *EA* is educational activity, *C* is monitoring, *R* – result.

The main and most time-consuming element of the system described above is the organization of training. It is divided into two components, namely content and technical. At the same time, they are equivalent and

both are mandatory. The first is traditional for the education system, and the second is characterized by contemporary features. This is access to the Internet, availability of hardware and software. The control stage belongs to the online studying organization algorithm. It should be versatile and include different tools and approaches to verification. This is explained by the fact that standard forms may not be effective during remote studying. For example, a survey may be biased because it is not possible to completely restrict students' access to learning materials (from which they can read), unlike when they study in class.

In addition to monitoring, it is important for the teacher to receive quality feedback. It also involves a special selection of forms and methods, on the basis of which they will be able to assess the general level of knowledge, identify learning problems. Therefore, it is advisable to choose control measures that correspond to the specific type of lesson and the complexity of the educational topic. Special attention should be paid to the technical capabilities of students during online studying. For objective and operational assessment of

students, it is advisable to use a criterion approach. This will make it possible to fairly determine the level of skills acquired by students.

Taking into account the peculiarities of classical methods and approaches to evaluation, it should be noted that they barely correspond to the objective principles of pedagogical measurements. This is expressed in the fact that the teacher independently determines the criteria and grounds for evaluating students. This approach is unacceptable because it is subjective at its core. Accordingly, at the moment there is an urgent need for the development of knowledge system control methods.

An important component is the control process, which involves the formation of clear methodological tasks for the teacher, the successful solution of which contributes to the creation of appropriate conditions for the implementation of the educational process. In addition, control allows for evaluation of the results of training, identifying problems and correcting them.

Thus, it can be stated that all the structural elements of the online studying scheme described are important and should be implemented qualitatively. This complicates the work of the teacher, thereby contributing to the increase in the level of effectiveness of the educational environment and the competence of students.

Discussion

The issue of training teachers for professional activities in remote form is actively discussed by researchers. The positions of the authors differ, which makes it possible to consider the process of improving the quality of education of future teachers from different angles. In particular, J. Bagwell [22] believes that the structure and features of distance education make it possible to spread the principles of leadership not only among students, but also among other subjects of the educational process, for example, methodologists, management bodies of educational institutions. According to the researcher, during such training it is worth remembering that the effectiveness of students' access to reliable and complete educational information depends on the manager's ability to conduct formal and informal contacts, as well as to develop a separate communication structure. Therefore, the author believes that in order to successfully solve this issue and prevent difficulties in the educational process, it is necessary to use online learning tools. The researcher emphasizes that during online education it is important not only to develop leadership qualities of students, but also to choose the right tools for formulating tasks and their remote verification. The common features of this scientific work and the results obtained in the article are that the distance approach has become particularly widespread in modern universities. Accordingly, after the cancellation of quarantine measures, some educational institutions will leave the mixed education format [23; 24].

In turn, S. Şenel & H.C. Şenel [25], and A. Christopoulos & P. Sprangers [26] investigated the

specifics of the impact of COVID-19 on the approach, tools and role of education worldwide. They argue that the introduction of quarantine restrictions triggered institutional changes that were irreversible. As a result, it was possible to form and spread modern technologies in the field of education. Researchers claim that the involvement of digital technologies is a necessary condition for the implementation of quality education. That is why they admit that contemporary education is impossible without the use of technology. This approach is aimed not only at the introduction of technological devices and mechanisms, but also involves the rational use of educational resources. As a result, the development of pedagogy takes place in such a vector that ensures the effective transformation of students' knowledge and skills in accordance with the requirements of today's society [27-29]. The obtained conclusions are intertwined with the results presented in this scientific work. This is expressed in the description of the priority of digital technologies in a modernized environment, in the conditions of globalization.

D. Taylor *et al.* [30] and K. Rapanta *et al.* [31] considered the organizational principles of university activity in a remote form. Researchers claim that such educational institutions should independently develop and implement an online system that will allow educational activities to be carried out remotely. It is necessary to form alternative approaches and mechanisms on the basis of which it is possible to teach or master the curriculum using computer technologies. Researchers believe that such a system should be equipped with digital technologies that teachers can use during the implementation of professional tasks, as well as actively manage them. The quality and effectiveness of online classes, including those during quarantine, are determined by a combination of external and internal factors. According to researchers, the educational process is effective if it defines specific goals and tasks, the achievement of which consists in following a clear algorithm. As a result, educational activities become interesting and relevant for students, and the process of presenting the material is coordinated. Scientists pay special attention to the relationship between the teacher and students. The result and level of students' skills depends on the quality of their communication and constructive feedback [32; 33]. This position is similar to that expressed in this study. In particular, online studying differs from in-class studying completely, which makes it necessary to take into account such features as educational infrastructure and subjects of educational activity.

B. Williamson *et al.* [34] and G.M. Francom *et al.* [35] studied the peculiarities of the influence of technical support on the quality of the remote educational. In their opinion, future teachers should consider all external factors that affect the peculiarities of conducting educational activities remotely. This is due to such factors as unstable access to the Internet, the cost of mobile communication services or Internet connection, availability of regular electricity supply,

special technical means [36; 37]. Scientists believe that during the educational and professional training of a teacher, it is also necessary to develop skills in working with information technologies. This factor is important in the conditions of digitization and acquisition of distance learning of special relevance. Thus, it will be possible to increase not only the level of professional competence of the teacher, but also to contribute to their personal development. As a result of successfully mastering pedagogical knowledge and information skills, young specialists will be able to develop their own online courses, platforms and sites [38]. This will positively affect the level of education in society, as well as the role of the teacher, which is currently being reformed. Researchers emphasize the special relevance of online classes, which are a modern form of implementing the educational process. This approach gained the most popularity in connection with the spread of the pandemic and the introduction of quarantine restrictions [39]. It is important to implement technologically beneficial educational programs in universities. For this, scientists consider it necessary to carry out systematic training of teachers in order to acquire the skills of proactive management and use of IT infrastructure. The conclusions drawn have common features with the results of this article. This is expressed in approaches to the educational and professional training of teachers, which should be implemented considering the features of a modernized society. Accordingly, the involvement of digital technologies in this process will improve the quality of pedagogical education [40].

Based on the above, it can be established that distance learning is a prerequisite for the future development of the entire educational environment. That is why future teachers should master the skills of using digital educational tools and other means necessary for the implementation of online studying.

Conclusions

As a result of conducting a scientific study, it was possible to identify the peculiarities of training future teachers for remote work. For this purpose, the main

differences between this form of education and the in-class form of studies are described, and its features are revealed. It was proven that practical classes allowed for carrying out an in-depth study of the educational topic, and for studying the main vectors of the theoretical material. Based on this, the successful formation of a wide range of abilities and skills of students takes place. The work established those certain difficulties arise during practical classes and lectures in remote form. They are related to technical support (which is the basis of the distance learning process); feedback; assessment; complexity of motivation; needs in individual psychological conditions; lack of control over students. These factors are expressed in students' access to the Internet and the lack of live contact between subjects of educational activity. All this affects the requirements for a modern teacher, which include not only pedagogical, but also informational and technical aspects.

Special attention was paid to the teacher's control over the students' activities and their evaluation. It was established that those processes had significant differences during online studying, as they require a systematic approach to their implementation. This implies the use of various methods of monitoring the level of students' training, as well as the use of specific criteria when assigning points.

Based on this, the modern training of future teachers requires the use of new means and approaches to training caused by the construction of new learning models. This affects the improvement of the quality and level of competence of modern teachers already at the stage of their educational and professional training. In future scientific works, it is expedient to determine the peculiarities of the use of robotic technologies in the training of future specialists in medical specialties.

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Conflict of Interest

None.

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Удосконалення дистанційної професійної підготовки студентів педагогічних спеціальностей

Лариса Семенова*

Кандидат педагогічних наук, доцент
Інноваційний університет Євразії
140000, вул. Ломова, 45, м. Павлодар, Республіка Казахстан
<https://orcid.org/0009-0008-8468-0221>

Анастасія Казанцева

Старший викладач
Інноваційний університет Євразії
140000, вул. Ломова, 45, м. Павлодар, Республіка Казахстан
<https://orcid.org/0000-0002-5449-0610>

Гульміра Сулейменова

Кандидат педагогічних наук, старший викладач
Павлодарський педагогічний університет
140000, вул. Олджабая Батира, 60, м. Павлодар, Республіка Казахстан
<https://orcid.org/0000-0003-4975-6557>

Багжанат Каірбекова

Доктор педагогічних наук, професор
Інноваційний університет Євразії
140000, вул. Ломова, 45, м. Павлодар, Республіка Казахстан
<https://orcid.org/0000-0001-6460-4645>

Клара Садирбаєва

Магістр, заступник директора
Казахський національний культурний центр Узбекистану
100000, 6-й проїзд Ніязбека Юлі, 20, м. Ташкент, Республіка Узбекистан
<https://orcid.org/0000-0002-8301-2810>

Анотація

Актуальність. Виникнення та поширення пандемії COVID-19 змінило діяльність усталених соціальних інститутів. Запровадження карантинних обмежень спричинило обов'язковий перехід на дистанційне навчання в освітніх закладах усіх форм і типів. Такі зміни вплинули на компетентність викладачів, яка не відповідала викликам сьогодення.

Мета. Метою роботи є дослідження шляхів підвищення якості освіти майбутніх учителів в умовах дистанційного навчання.

Методологія. Для досягнення мети було використано методи аналізу та синтезу, дедукції, абстрагування та узагальнення.

Результати. У результаті було встановлено, що впровадження дистанційного навчання стало новим підходом для казахстанського освітнього середовища. Це визначило необхідність порівняння елементів очного та дистанційного навчання з метою розробки ефективної моделі сучасної онлайн-освіти. В результаті було визначено основні відмінності між двома видами освітнього процесу. На основі цього описано особливості підготовки викладачів до виконання ними педагогічних завдань в умовах онлайн-освіти. Таким чином, охарактеризовано аспекти, які необхідно враховувати під час освітньо-професійної підготовки майбутнього вчителя в умовах дистанційного навчання.

Висновки. Отримані результати можуть бути використані під час розробки онлайн-курсів та освітніх програм для підвищення рівня компетентності студентів-педагогів у процесі дистанційної професійної діяльності.

Ключові слова: онлайн-курс; пандемія; навчання в умовах карантину; викладання; компетентність.