

THE EFFECTIVENESS OF THE IMPLEMENTATION OF INTERACTIVE METHODS IN THE DISTANCE LEARNING SYSTEM OF FUTURE PRIMARY SCHOOL TEACHERS

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INTRODUCTION

Social change, scientific and technological progress, changing interests of the younger generation, the spread of coronavirus disease requires the search for new effective models, the latest technologies for the educational process to ensure a high level of professional activity and personal qualities of the future specialist. This requires rethinking and finding new organizational forms and methods of training that would improve its quality and effectiveness, expand and deepen the content of training. This is especially relevant in the context of the introduction of distance online learning, because the traditional methods used by the teacher in the classroom are not effective in the process of distance learning, which has its own specifics. Adapting to the online teaching system in a crisis is the biggest teaching challenge that educational institutions face in tackling the pandemic (LIGUORI, WINKLER, 2020; APPOLLONI et al., 2021).

LITERARY REVIEW

Distance education or distance learning is an area of education that focuses on pedagogy, technology and educational systems aimed at educating students who are not physically in place (UNESCO, 2010). New terms are now emerging: online learning, digital learning, e-learning and virtual learning, which are

synonymous and interchangeable. These terms only define the distance learning transmission mechanism (TRAXLER, 2018). The development of distance learning can be seen as a direct consequence of digitalization in higher education, which enables both societies and educational organizations to create new opportunities for growth, improvement, change and renewal (ILMARINEN, KOSKELA, 2015).

The health emergency situation makes distance learning to take the form of emergency remote education (ERE), which allows students and teachers to continue their teaching and learning activities (GIACOSA, 2020; BOZKURT et al., 2020). However, distance learning has a number of advantages and disadvantages. According to a study of Lassoued et al. (2020) there are the following obstacles to achieving the quality of distance learning during the COVID-19 pandemic:

1. Personal barriers (weak motivation of students to distance learning, lack of interaction in contrast to traditional learning; distance courses are performed in the style of lectures and are not diversified by modern teaching methods);
2. Pedagogical obstacles (the difficulty of studying some applied courses, the need for direct interaction between professor and student);
3. Technical barriers (low Internet speed, data security and privacy issues, as well as protection against piracy on websites);
4. Financial and organizational barriers.

Researchers Markova T. et al. (2017) found that students are generally positive about their distance learning experience, but the lack of feedback or contact with the teacher impairs the effectiveness of learning. Research shows that distance students have worse results than full-time students (LANE, GREGSON, 2019). There is a lack of feedback or contact with the teacher and a lack of control in distance learning (PANT, 2014). Also it has a lack of strong motivation and ability to work effectively over time, a sense of isolation (FOJTÍK, 2018). The teachers consider that the main problem is that they implement the same pedagogical and didactic practices, as in full-time education (FOJTÍK, R. 2018). Scientists Pogodaeva et al. (2019); Fojtik, (2018); Zhou et al., (2020) note that conventional distance learning courses, which are built in accordance with traditional classroom learning, are not effective because students are insufficiently aware of the acquired knowledge and unable to apply it in practice. This feature is emphasized by Allen et al., (2004); Shachar; Neumann, (2003). They argue that the teacher is unlikely to have a significant impact on learning outcomes, but the content of teaching material, teaching methods, communication and student support are extremely important to students and can affect its effectiveness.

Thus, the professional training of future primary school teachers in the process of distance learning is significantly complicated by the limited opportunities for personal communication between teacher and student, reduces the quality of theoretical material, which is the basis for further development of practical skills. Social challenges and the need to adapt training courses to the conditions of distance learning determine the need to find effective methods of processing educational material.

An important stage of our research at the theoretical stage was the search for effective teaching methods. The effectiveness of the introduction of interactive technologies has been noted by many scientists, among them: Vlasii, O. et al. (2020); Abykanova et al. (2016); Castillo-Manzano et al. (2016), however, their adaptation to distance learning and efficiency research has not been studied.

First of all, interactive learning is the interaction between student and teacher and between students (AKHMEDOV et al., 2020). This is exactly what must be included to the distance learning process. Interactive learning gives students the opportunity, along with teachers, to participate in the learning process, give suggestions and opinions about its organization and course, as well as much more active interaction with other participants. Socialization, which provides interactive learning, is extremely valuable in a situation where students grow up surrounded by technology and less and less reduce their personal contacts (MLADENOVA, TOPALSKA, 2020). The specificity of these methods is the mandatory consideration of the peculiarities of distance learning, the integrated use of both pedagogical and organizational tools (TECHNOLOGIES OF DISTANCE PROFESSIONAL TRAINING, 2018).

There are many classifications of interactive technologies in the pedagogical literature, which are based on different criteria. We used the classification proposed by O. Pometun and L. Pyrozhenko (2004), who divide interactive technologies by forms of learning into four groups, depending on the purpose of the lesson and the forms of organization of students' learning activities:

- interactive technologies of cooperative learning (work in pairs, threes, carousel, work in small groups, aquarium, etc.);
- interactive technologies of collective and group learning (microphone, unfinished sentences, brainstorm, etc.);
- technologies of situational modeling (simulation games, role play, dramatization, etc.);
- technologies for processing discussion questions (PRES method, position loans, case method, discussion, etc.).

HYPOTHESES

Thus, we *hypothesized* that the formation of the readiness of future teachers to use pedagogical technologies will be more effective if interactive learning technologies will be introduced in the process of distance learning.

The purpose of the study was to test this hypothesis and answer the following questions that arise from the relevance of the topic and the problems of distance learning, namely:

1. Are the learning outcomes of distance technology and distance technology with the use of interactive methods the same?
2. How does distance learning with the use of interactive methods affect the readiness of students to use pedagogical technologies in future professional activities?
3. What interactive methods are most effective and convenient for use in remote format?

METHODS AND MATERIALS

The subjects of the study were students of the specialty 013 "Primary Education" of 19-20 years old, who are studying in the 2nd year. Experimental basis of the study includes 290 students of: Academician Stepan Demianchuk International University of Economics and Humanities, Lesya Ukrainka Volyn National University, Rivne State University of Humanities, Municipal Institution of Higher Education "Vinnytsia Humanitarian and Pedagogical College." The size of a valid sample was 117 people after calculating the size of the required (representative) sample using an online calculator (with parameters: confidence probability - 95%, error - 7%). This number was the starting point for the formation of the experimental group (EG) ($n = 56$) and the control group (CG) ($n = 61$).

The experimental research took place during the remote study of the discipline of the cycle of professional training "Pedagogical technologies in primary school" in the Google Meet System. Interactive technologies were introduced into the educational process of students of the experimental group. The students of the control group studied according to the traditional system. The study was organized in three stages during 2020-2021:

The first stage (preparatory) included:

- selection, substantiation and theoretical understanding of the problem and research topic, conducting a survey to identify problems of distance learning;
- development of the program, methods of conducting the experiment;
- development of a distance course in the discipline "Pedagogical technologies in primary school" using interactive teaching methods.
- The second stage (main) included:
 - pre-experimental measurement;
 - experiment using a remote interactive course in the discipline "Pedagogical technologies in primary school;"
 - post-experimental measurement.
- The third stage (final) included:
 - data processing of pre-experimental measurement and post-experimental measurement;
 - interpretation of statistical indicators;
 - comparison of the obtained results with the expected ones;
 - development of recommendations and registration of research results.
- According to the tasks of each of the stages we used the following methods:
 - theoretical (analysis and synthesis of philosophical, psychological and pedagogical sources in the field of professional training of future primary school teachers, modeling and design);
 - empirical (methods of identifying the attractiveness of the profession of V. Yadov, modification of N. V. Kuzmina, A. A. Rean (REAN, 2016), questionnaire "Determinant of the dominant level of problems in the process of solving pedagogical problems"

(KASHAPOV, DIACHENKO, 2006), summary information on the results of the final test control during the examination session);

- statistical (K. Pearson's criterion) (χ^2). A software package for statistical analysis "Statistica" was used for the analysis of quantitative data.
- Having processed the working program of the discipline of the cycle of professional training "Pedagogical technologies in primary school," we have identified program competencies and program learning outcomes that students should acquire after its study. In the future, they served as material for determining the criteria and indicators of readiness of future primary school teachers to use pedagogical technologies.

The components of readiness of future teachers for pedagogical activity in the conditions of distance learning are: motivational, cognitive and activity, which are correlated with the criteria. According to these criteria, indicators and three levels of readiness of future teachers to use pedagogical technologies were determined: high, middle and low (Table 1).

Table 1. Criteria and indicators for determining the levels of readiness of future teachers to use pedagogical technologies

Criteria	Motivational	Activity	Cognitive
Indicator	Formation of motives, needs in use of pedagogical technologies, focus on their use with the purpose of various development of the personality of each child.	Perfect mastery of pedagogical, methodological, theoretical and practical knowledge of pedagogical learning technologies and their use in the educational process of primary school.	High level of knowledge of own and students' potential opportunities to use pedagogical technologies of training in educational process of primary school. High level of knowledge in academic disciplines (grade A "excellent" for ECTS scale).
High level			
Indicator	The middle level of formation of motives, the need to use pedagogical technologies.	Knowledge of pedagogical, methodological, theoretical and practical knowledge of pedagogical learning technologies and their use in the educational process of primary school at a sufficient / intermediate level.	Sufficient level of knowledge of own and students' opportunities to use pedagogical technologies of training in educational process of primary school. Sufficient level of knowledge in academic disciplines (grades B "very good," C "good" for ECTS scale).
Middle level			
Indicator	Insufficient formation of motives, needs in the use of pedagogical technologies.	Knowledge of pedagogical, methodological, theoretical and practical knowledge of pedagogical learning technologies and their use in the educational process of primary school at a low level.	Satisfactory level of knowledge of own and students' potential to use pedagogical learning technologies in the educational process of primary school. Satisfactory level of knowledge in academic disciplines (grades D "satisfactory," E "sufficient" for ECTS scale).
Low level			

Source: search data.

In order to determine which interactive methods are the most effective and which should be used, we identified the potential of interactive teaching methods to form the readiness of future teachers to use pedagogical technologies in accordance with scientific and methodological literature (Table 2).

Table 2. Didactic potential of active teaching methods in the system of distance education

Method	Advantages of application in remote work
Microphone	Gives each student the opportunity to say something quickly, in turn, answer questions or express their opinion or position. In this way, all students can be involved. Instead of an "imaginary microphone," you can use the following algorithm: first the teacher names the student who answers first, then the student names the other student to be answered.
Unfinished sentences	This technique gives the opportunity to express their own ideas, to compare them with others. It helps to express opinion more freely on the proposed topics, to practice the ability to speak briefly, but convincingly. The teacher formulates an unfinished sentence and asks the students to speak and finish. The unfinished sentence can be displayed on a slide.
Brain storm	This method helps students to generate ideas, find solutions to complex problems, work in a team. You can use an "imaginary board" or a chat to express ideas in the process of distance learning.
Role play	Role play helps students to try themselves in the role of teacher, student, parents, class teacher, principal, etc. It focuses on planning the interlocutor's own language behavior, develops the ability to control their actions, to give an objective assessment of the actions of others. The main task of the teacher in the process of distance learning is to select the necessary situations and / or illustrations and situations and assign roles.
Case method	This method helps to immerse future teachers in real professional activities, to practice practical skills. This method can be used in the course of lectures and practical classes, it is especially relevant for working out non-standard tasks and pedagogical situations.
Discussion	The method of discussion in the process of distance learning is an important factor in motivating learning to work actively in the classroom. The topic of discussion and the teacher's questions should be chosen in such a way as to force students to express their opinion, share it with others, argue it or refute the participants' theses. This method provides communication and feedback, which is absent in the process of remote work.
Take a position	This method will help to organize a discussion or debate on a controversial issue, is similar to the method of discussion, but this method should use two opposing views that do not have an unambiguous (correct) answer. This method can be used to enhance the cognitive activity of students on controversial didactic or educational issues.
Work in pairs, threes, work in small groups	Interactive technologies of cooperative learning are difficult to apply online, however, it is a good method for independent work of students. Students can form groups, pairs, or threes to do homework, thus providing communication between students that is often absent in the distance learning process.

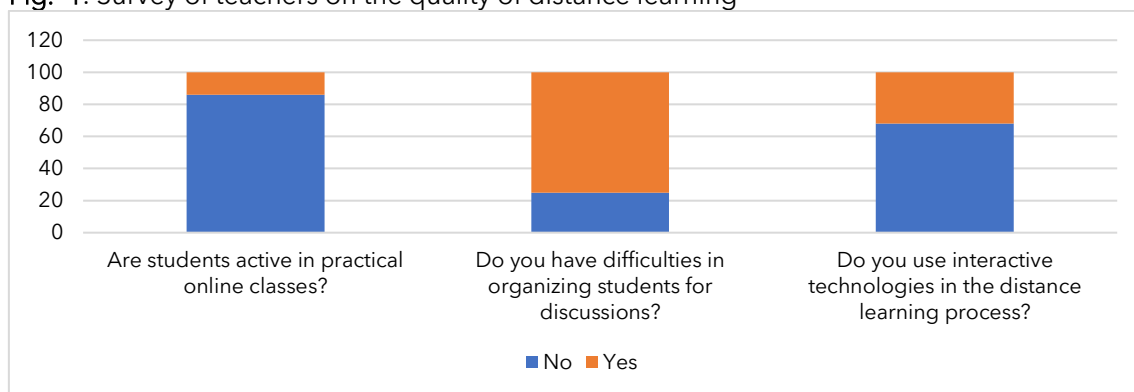
Source: search data.

Thus, the determined didactic potential and possibilities to use interactive technologies made it impossible to develop a distance online course "Pedagogical technologies in primary school" for future primary school teachers.

RESULTS

At the ascertaining stage of the pedagogical experiment, we used methods of questionnaires of teachers with the help of Google Forms software to obtain data on the problems of distance learning. The questionnaire covered teachers of pedagogy and professional methods of primary education (universities) in the amount of 211 people. The questionnaire contained three closed-ended questions yes / no. Respondents could write comments on each question. The obtained data are presented in Fig. 1.

Fig. 1. Survey of teachers on the quality of distance learning



Source: search data.

The first question "Are students active in practical online classes?" is answered by the majority of 86% of teachers that students are not active. The answers led to the conclusion that the teacher often addresses the students himself, the applicants often turn off the cameras and microphones, or complain about the bad internet. Students often do not prepare for practical classes, do not take distance learning seriously.

The second question "Do you have difficulties in organizing students for discussions?" got answers "Yes" by 75% respondents, "No" – 25%. Teachers noted that the most "closed" are 1-2 year students, 3-4 year students and master's students are usually more active, do not hesitate to answer and ask questions.

The third question "Do you use interactive technologies in the process of distance learning?" got answers "No" by 68% of respondents, "Yes." – 32%. Among the analyzed answers, teachers most often stated that they use multimedia learning technologies and do not know how to adapt interactive or other technologies to the online format of classes. After analyzing the data, we concluded:

- all teachers, without exception, face difficulties in the process of distance learning;
- teachers often find it difficult to adapt the course to distance online learning;
- the main problem is the lack of interaction between teacher and students in the process of remote work;
- the vast majority of teachers do not use or do not know how to use interactive technologies in the process of distance learning.

The next task of our study was to carry out pre-experimental measurement. In order to test the effectiveness of the defined methodology, it was necessary to determine the initial levels of formation of the components of readiness for teaching in students according to the questionnaires and tests specified in the methodological base of the study. The data obtained in the process of this diagnosis are presented in table 3.

Table 3. Comparative table of readiness of future primary school teachers for the use of pedagogical technologies (pre-experimental measurement)

Criteria	Levels	Pre-experimental measurement (%)	
		EG	CG
Motivational	High	19.1	21.9
	Middle	55.3	53.2
	Low	25.6	24.9
Activity	High	22.1	19.1
	Middle	54.8	56.1
	Low	23.1	24.8
Cognitive	High	24.2	24.9
	Middle	58.9	57.1
	Low	16.9	18

Source: search data.

According to the the main indicators of readiness for the introduction of pedagogical technologies, the experimental and control groups are quite similar before the experiment. According to the indicators of the motivational component, the majority of students showed middle level (55.3% and 53.2%, respectively). The low level is characteristic of 25.6% of students in the experimental group and 24.9% – in the control group. Indicators of a high level of motivational component indicate that these groups are approximately the same: 19.1% of respondents in the experimental and 21.9% in the control groups.

According to the criterion of development of the activity component of readiness for the application of pedagogical technologies in both the experimental and control groups, the largest share was made up of students with middle level (54.8% and 56.1%, respectively). A high level of development of the activity component is inherent in 22.1% of future teachers in the experimental group, 19.1% in the control group. Almost the same number of participants (23.1% – in the experimental group, 24.8% – in the control group) showed a low level of readiness to use pedagogical technologies for the described component.

According to the indicators of the cognitive component of readiness to use pedagogical technologies in both groups, a high level was about 25% of the surveyed students. The largest share – 58.0% in the experimental group, 57.1% in the control group – were students with middle level of formation of this characteristic. A low level of component formation was found in 16.9% of students in the experimental group and 18.0% of students in the control group. Thus, we can conclude that both groups are approximately equal in distribution, students have middle level of readiness to use pedagogical technologies, a high level is inherent in less than a quarter of respondents. After the introduction of distance learning courses in the educational process with the use of interactive technologies, repeated measurements were performed according to the same defined diagnostics. Their results are given in table. 4.

Table 4. Comparative table of readiness of future primary school teachers for the use of pedagogical technologies (post-experimental measurement).

Criteria	Levels	Post-experimental measurement (%)	
		EG	CG
Motivational	High	30.8	23.8
	Middle	57.9	53.5
	Low	11.3	22.7
Activity	High	33.8	19.5
	Middle	56.9	57.6
	Low	9.3	22.9
Cognitive	High	40	25.9
	Middle	53.8	62.4
	Low	6.2	14.9

Source: search data.

Comparison of indicators in Table 4 shows that positive changes have occurred in all components of readiness of future teachers of the experimental and control groups. The motivational component of the readiness of future teachers in the experimental group underwent the following changes: low-level students decreased by 14.3%, high-level students increased by 11.7%, and middle-level students increased by 2.6%. There were also positive changes in the control group, but not so significant: students with a low level decreased by 2.2%, and with a high level increased by 1.9%, respectively, the middle level is 53.5% (the difference between pre-experimental measuring is 0.3%).

The best indicators are observed in the indicators of the cognitive component. Thus, in the experimental group, the indicators of the high level of formation increased by 15.1%, the middle decreased by 5.1%, and the low by 10.7%. At the same time, in the control group, the indicators of high levels of formation increased by 1%, middle by 5.3%, and low decreased by 3.1%.

The analysis of the indicators of the activity component of the readiness of future teachers of the experimental group to use pedagogical technologies shows an increase in the indicators of the high level by 11.7%, middle – by 2.1%, and low decreased by 13.8%, respectively. At the same time, in the control group, changes in high-level indicators increased by 0.4%, middle-

level indicators by 1.5%, and low-level indicators decreased by 1.9%. In general, it can be noted that the changes in the control group took place, but are not so significant.

The use of distance learning in the experimental group with the use of interactive teaching methods in the course "Pedagogical technologies in primary school" was, in our opinion, the reason for increasing the high level of readiness to use pedagogical technologies and the transition of low-level students to the middle level. In order to determine whether there are differences in the distribution of students of the experimental and control groups after the experiment on the levels of readiness to use pedagogical technologies, we used the criterion χ^2 . We formulate a hypothesis:

H_0 - the level of readiness to use pedagogical technologies after the experiment in the control and experimental groups is the same;

H_1 - the level of readiness to use pedagogical technologies after the experiment in the control and experimental groups is higher than in the control.

The obtained value $\chi^2_{Emp} = 21.68$ is more critical, which is equal to $\chi^2 = 5.991$ for the significance of $p = 0.95$ and the number of degrees of freedom $C = 2$. Thus, $21.68 > 5.991$ ($\chi^2_{Emp} > \chi^2$) for $p = 0.95$. Therefore, hypothesis H_0 is rejected, and the hypothesis H_1 is accepted. The difference between the distributions is statistically significant.

Research limitations

The main limiting factors of the study are that the experimental work was conducted only during the study of one discipline "Pedagogical technologies in primary school." Restrictive factor is also a small period of time devoted to the implementation of the formative experimental stage (1 semester).

DISCUSSION

Answering the questions of our study, we note:

1. Experimental research has confirmed that there is a difference between the results of distance technology and distance technology with the use of interactive methods. The developed course is more effective than traditional distance learning. In our opinion, this is due to the fact that learning has become more student-centered, increased interaction with the teacher. Our data are supported by a study of Grzych & Schraen-Maschke (2020), which states that interactive teaching methods can be useful for the continuity of medical education by maintaining the necessary contact with people.

2. Distance learning with the use of interactive methods has a positive impact on the readiness of students to use pedagogical technologies in future professional activities. The increase in the indicators of the cognitive component is explained by the fact that the students of the experimental group did not just record the educational material from the slides or perceive it by ear, but processed it with the help of interactive methods. Also, students often got acquainted with the study material in advance, and in the classroom worked on complex material. Thus, the traditional online lecture session turned into a discussion with the active involvement of students. The influence on the activity component of readiness for use was carried out at the expense of practice-oriented interactive teaching methods: the case method, the project method, discussions, etc. The use of these exercises is effective for the future teacher of primary education, because students learn to think outside the box, apply the acquired knowledge in practice, solve problem pedagogical situations.

3. The peculiarities of our methodology were that we determined the didactic potential of interactive methods and chose those teaching methods that can be adapted to a distance online format. Also the selection of methods was oriented according to the complexity of theoretical material and competencies that students had to master after studying a topic. We agree with Kutbiddinova (2020) that interactive methods of organizing classes help not to deviate from traditional forms of learning. The most effective in the context of professional training of future primary school teachers and adaptation to the features of distance online learning are the following methods: microphone, unfinished sentences, brain storm, role play, case method, discussion, take a position, work in pairs, threes, work in small groups.

CONCLUSIONS

Summing up, we can say that the process of distance learning with the use of interactive technologies is effective. The data of the experimental study confirm the hypothesis. According to the analysis and generalization of the results of the pedagogical experiment, we can conclude that the implementation of the experimental program in the training of future primary school teachers has a number of advantages that give a possibility to effectively implement the educational process in a distance format. The main advantage of interactive technologies is that it allows solving the main problems of online learning – the lack of interaction between students and teachers and the lack of motivation and emotion.

In the process of pedagogical experiment it was found that the success of the use of interactive teaching methods in distance vocational education requires high professionalism of teachers. Interactive methods implemented in the process of distance learning, give students the opportunity to form not only knowledge of the discipline, but also emotional and value attitude to them, skills to apply knowledge and skills in non-standard situations, to implement the requirements of a competent approach to education.

Distance online learning will be more effective under the following conditions: psychological support of the student (creating a situation of success), reducing the amount of theoretical material in lectures or presenting it in the form of diagrams, tables of drawings; involvement of student life experience, providing clear instructions to students on the organization of online classes, assessment methods and expected learning outcomes.

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The effectiveness of the implementation of interactive methods in the distance learning system of future primary school teachers

Eficácia da implementação de métodos interativos no sistema de ensino a distância para futuros professores do ensino fundamental

Eficacia de la implementación de métodos interactivos en el sistema de enseñanza a distancia a los profesores futuros de escuelas primarias

Resumo

O artigo determina que o principal problema do ensino online distância é a falta de interação entre professor e aluno. A organização do estudo foi realizada em três etapas ao longo dos anos 2020-2021. Para realizar a análise dos resultados obtidos e a consideração objetiva da dinâmica das mudanças nos componentes da cognição, atividades, motivação, os métodos de processamento de dados matemáticos e o pacote de software para a análise estatística "Statistica". O estudo realizado demonstrou a eficácia da aplicação de métodos interativos no sistema de ensino a distância e o desenvolvimento de todos os componentes de disponibilização dos futuros professores do ensino fundamental para a utilização das tecnologias pedagógicas. A autora concluiu que os métodos mais eficazes no contexto da formação profissional de futuros professores do ensino fundamental e adaptação às peculiaridades do ensino online a distância são os seguintes: microfone, frases inacabadas, brainstorming, dramatização, estudo de caso, discussão, posição, trabalhe em pares, em três pessoas, trabalhe em pequenos grupos.

Palavras-chave: Educação a distância. Cursos à distância. Métodos de ensino interativos. Futuros professores do ensino fundamental. Formação profissional.

Abstract

The article identifies that the main problem of distance online learning is the lack of interaction between teacher and student. The study was organized in three stages during 2020-2021. The methods of mathematical data processing and the software package for statistical analysis "Statistica" were used for the analysis of the obtained results and objective consideration of the dynamics of changes in the activity, cognitive and motivational components. The study showed the effectiveness of interactive methods in the distance learning system for the development of all components of the readiness of future primary school teachers to use pedagogical technologies. The author concluded that the most effective methods in the context of professional training of future primary school teachers and adaptation to the features of distance online learning are: microphone, unfinished sentences, brain storm, role play, case method, discussion, take a position, work in pairs, work in threes and small groups.

Keywords: Distance education. Distance learning courses. Interactive teaching methods. Future primary school teachers. Professional training.

Resumen

El artículo determina que el problema principal de la enseñanza en línea a distancia es la falta de interacción entre profesor y alumno. Para realizar el análisis de resultados obtenidos y la consideración objetiva de dinámica de cambios en los componentes de cognición, actividades, motivación, fueron aplicados los métodos de procesamiento matemático de datos y el paquete de software para el análisis estadístico. El estudio realizado demostró la eficacia de aplicación de los métodos interactivos en el sistema de enseñanza a distancia y el desarrollo de todos los componentes de disponibilidad de los profesores futuros de escuelas primarias para utilizar las tecnologías pedagógicas. El autor llegó a la conclusión de que los métodos más eficaces en el contexto de la formación profesional de los profesores futuros de escuelas primarias y la adaptación a las peculiaridades de enseñanza en línea a distancia son los siguientes: micrófono, frases inconclusas, lluvia de ideas, juego de rol, estudio de caso, discusión, ocupe la posición, trabajo en pares, en tres personas, trabajo en grupos pequeños.

Palabras-clave: Educación a distancia. Cursos a distancia. Métodos de enseñanza interactivos. Profesores futuros de escuelas primarias. Formación profesional.