



DOI: 10.54919/physics/55.2024.232ok6

## Psychological and pedagogical conditions of training future primary school teachers using modern digital educational resources

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### Abstract

**Relevance.** The relevance of the research is conditioned upon the need to consider the fundamental aspects of training future primary school teachers in the conditions of digitalisation and globalisation, which are constantly improving and changing, in this regard, it is quite essential to take into account the whole range of conditions for the training of a highly competitive future specialist.

**Purpose.** The purpose is to analyse the psychological and pedagogical conditions for the development of future primary school teachers using modern digital educational resources.

**Methodology.** The research used such methods as logical analysis, deduction, induction, synthesis, functional analysis, and survey method.

**Results.** During the implementation of the work, the main features of the educational process in the conditions of digitalisation were identified, and the characteristic of inherent elements and principles of implementation were provided. A survey was conducted, in which 127 students participated. The significance of the questionnaire survey is conditioned upon the fact that it allowed identifying positive and adverse aspects of the introduction of information and communication technologies into the educational process, the main problems that arise for future teachers. In addition, a pedagogical experiment was conducted based on this university of 2 groups: group No. 1 (64 students) and group No. 2

### Suggested Citation:

Aidarbekova K, Abildina S, Mukhametzhanova A, Nagymzhanova K, Kopbalina K. Psychological and pedagogical conditions of training future primary school teachers using modern digital educational resources. *Sci Herald Uzhhorod Univ Ser Phys.* 2024;(55):2326-2336. DOI: 10.54919/physics/55.2024.232ok6

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(63 students). The perspective of introduction and further use of virtual reality in the learning process was considered. The main components of the successful professional realisation of a future specialist were considered.

**Conclusions.** The practical value of the obtained results consists in obtaining information about the main difficulties that do not allow the educational process to be realised effectively in modern conditions, in this connection recommendations were provided for future teachers considering psychological and pedagogical conditions to prepare highly competitive future specialists and improve the level of quality of education in general.

**Keywords:** information literacy; Internet technologies; information and communication technologies; virtual reality; professional competences.

## **Introduction**

In the present period of societal development, more and more attention is paid to the information training of students. Modern conditions require countries and supranational associations to have the competitiveness provided by information technologies and digital transformation. Therefore, digital skills and competencies should be developed throughout the educational process, starting from kindergarten and primary school. To successfully teach various subjects in the primary grades using technology, the teacher must both master methodological skills and have a deep understanding of computational thinking. For example, students learn to surf the Internet, search, collect, process, store and transmit information in various forms, learn the elements of robot assembly and programming, and develop logical skills. In this regard, primary school teachers need to be information and communication technology (ICT) trained to effectively organise the teaching and learning process at school.

Society highly appreciates the level of information literacy and education of future specialists, thus the requirements for them are appropriate. According to Sh.Kh. Kurmanalina [1], an important step in the training of such teachers is the integration of media education with the existing basic training. To comply with modern requirements, disciplines should be oriented towards using media tools and introducing innovative information and communication technologies. As R.K. Dusembinova & D.B. Esmagambetova [2], 2018 at the international summit presented the report "Education for a Complex World", which identified the trends of education of the new generation, where the key element of global trends in the development of education and its transformation are digital technologies; therefore, this challenge was adopted by the Republic of Kazakhstan (RK). According to the decision of the state programme "Digital Kazakhstan" [3], the pedagogical conditions of training future specialists in the system of continuous professional education are planned to be revised, the main task of which is to improve. In the programme of digitalisation of the state infrastructure, the second direction emphasises the need to develop a creative society. It includes the development of competencies and skills for the digital economy, increasing the digital literacy of the population, and training ICT specialists for industries.

Starting from preschool institutions and up to all levels of education, the material and technical base and teaching staff should have information and communication competencies and use information and communication tools in the teaching and learning process. According to the position of D.M. Naimanova & L.A. Lebedeva [4], the

digitalisation of the education system requires teachers to increase their ICT competencies, and educational institutions are switching to digital learning technologies. Without the widespread use of digital technologies, it is impossible to improve the learning process and bring methods and tools in line with the requirements of modernity, optimise the content and process of developing the professional competence of future specialists, and model pedagogical conditions. Teaching digital technologies increases the efficiency of the teacher's work: students receive more complete and comprehensive information on the subject examined, audiovisual visuals contribute to a better understanding of the subject and reduce learning time, there is an opportunity to demonstrate the dynamics of development over time, and the activity of the subjects of the educational process is activated [5].

G. Baishan [6] notes that one of the new and significant ways to improve the process of developing professional competence of future primary school teachers is to purposefully manage students' personal-activity approach based on understanding its regularities and applying appropriate methods, means and forms of teaching. Therefore, digital technologies play an important role in the training of future primary school teachers. The introduction of digital technologies into the educational process leads to the solution of scientific, technical, methodological and organisational problems of the training process of future specialists and ensures the quality of professional competence of each university graduate. According to I.V. Bordiyanu *et al.* [7], the main areas of improvement of the educational process are programmed learning using digital technologies and the practical application of automated learning and dialogue exchange of information of training programmes with the subjects of the educational process. Therewith, the principles of personalised learning are applied. Nowadays, it is necessary to train primary school teachers who are proficient in both conventional methods and new digital technologies. The requirements of the time consist of the establishment and implementation of various models of digital competencies development in the educational environment. The European model of digital competencies of a teacher identifies 22 elementary digital competencies united into 6 groups: professional engagement, work with digital resources, teaching and learning, assessment and feedback, involvement and support of learners, development of learners' digital competencies [8].

According to the above, the purpose of the research is to explore the psychological and pedagogical conditions of training future teachers in the conditions of digitalisation. In turn, the resolution of a range of tasks is of particular

importance. First of all, it is to determine the current state of digitalisation of education, to identify the main requirements for the future teacher and to consider the fundamental principles of implementation. Secondly, it should be mentioned to conduct an empirical study, namely a survey among 127 students. It will provide an opportunity to highlight the range of difficulties and problems arising in future teachers when using information and communication technologies in professional activities and to identify the benefits of the digitalisation of education. Thirdly, based on the identified problematic aspects during the survey, it is worth providing some recommendations. It will improve the level of effectiveness of the implementation of the educational process in the conditions of digitalisation and globalisation.

### **Materials and Methods**

The material basis of the conducted research consisted of the examination of regulations, which provided an opportunity to analyse modern requirements for teachers. In particular, these are the state programme “Digital Kazakhstan” [3] and the state standard of higher education [9]. This research was implemented by using different types of analysis. Thus, the method of functional analysis provided an opportunity to disclose the phenomenon of digitalisation and identify its characteristic features and principles of implementation, in particular, its role in influencing the education sector. The method of logical analysis was used to determine the main principles and requirements for future primary school teachers in the conditions of digitalisation of education, identifying problems and contradictions. In addition, due to using this method, the key concepts, namely “digitalisation of education”, “information and communication competencies”, “electronic methodological systems”, and “information and educational environment” were defined, and their interrelation with the development of competences in future specialists was described. The formal-legal method was used to analyse the regulations that enshrine the basic requirements and competencies of future teachers in the conditions of digitalisation. Thus, the above-mentioned materials were explored. The method of legal hermeneutics was used to highlight the features of modern professional competencies of a teacher, which are related to the introduction of digital technologies in the educational process.

The method of abstraction provided an opportunity to explore the key object of the work – the psychological and pedagogical conditions of training students of pedagogical speciality, to highlight the range of features and inherent elements. The method of analogy was applied to understand the role of digital technologies in education, as it allowed identifying similarities and differences between digital technologies and other aspects of education to identify aspects to improve the learning and education process. In addition, it helped to identify potential challenges and problems associated with the digitalisation of education. The deduction method helped to identify the role of digital technology in learning by uncovering its main characteristics, principles and elements. In turn, the method of induction helped to identify the key competencies of a future primary school teacher based on

the characteristics of using innovation and communication technologies in the educational sector. The method of synthesis provided an opportunity to disclose the prospects of digital technologies in education based on the obtained information. Thus, the methods of functional and logical analysis were used to identify the role of digital technologies in the educational segment. Formal-legal methods and legal hermeneutics served as a foundation for considering modern competencies and requirements for a future educator. The methods of abstraction, analogy, deduction, induction and synthesis were introduced to identify current problematic aspects and prospects for further development of the process of digitalisation of education and to analyse the psychological and pedagogical conditions of training a future specialist.

The research was based on the implementation of a survey, in which 127 students participated. This survey, which was based on the opinion of the interviewed future primary school teachers, allowed identifying the main advantages and disadvantages of using digital technologies in the educational segment. In addition, a pedagogical experiment was conducted, in which 127 students participated. The students were divided into 2 groups: group No. 1 consisted of 64 students, and group No. 2 consisted of 63 students. It, in turn, allowed determining recommendations for improving the effectiveness of education and training of future competitive and highly qualified specialists.

### **Results**

#### **The role of digitalisation in the education sector**

Modern society requires educators with different levels of education and high professional level who are ideally equipped with technology. Competence-based approach to education in higher education provides an opportunity to develop different qualities of a student that help them to develop realisation in the ever-changing reality. The state standard of higher education describes competencies as “the ability to use the knowledge, skills and abilities acquired in the process of education in professional activity” [9]. According to modern requirements for the processes that occur in learning, the development of the student’s personality is expressed both in the development of skills of a narrow professional nature and in the ability to function in diverse environments, interact in differentiated ways, use the full range of abilities, to analyse cause-effect relationships, and to develop the ability to predict dynamics in its non-linear manifestation [10]. At present, there is a need to revise the existing approach to the training of specialists to comply with the requirements of the modernisation of professional education, meet the public demand and consider the achievements in the field of teaching methodology. As a result, it is essential to implement the teaching of pedagogical disciplines using modern educational technologies to enhance the effectiveness of training of future primary school teachers.

Due to the process of digitalisation, technology has become an integral part of all areas of human activity, strongly influencing and establishing a global space of information. The digitalisation of education is characterised by the widespread use of technologies whose development outpaces the development of human abilities

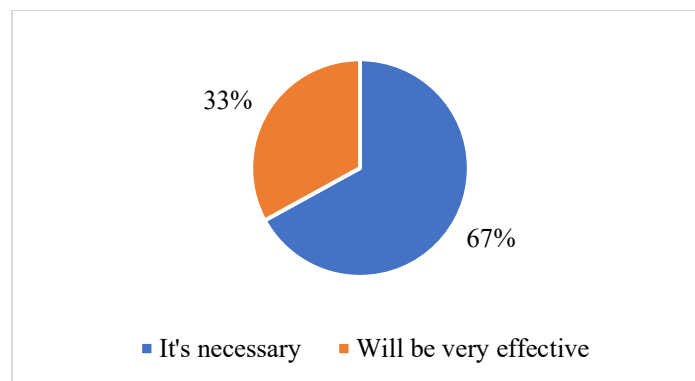
to use them effectively [11]. Therefore, in the implementation of the learning process, it is worthwhile to use those technologies that are designed to develop skills in working with information. Internet technologies in education are an important information tool for the modern educator. However, they are not just technical means of learning, as they represent a new way of organising the learning process, which contributes to increasing its intensity and efficiency.

In general, the concept of Internet technologies in the training of future primary school teachers should be understood as a system of interaction between the future teacher and students, which includes general pedagogical, psychological, didactic and methodological procedures, taking into account technical and human resources. These procedures provide the opportunity to implement methods and shapes of innovative teaching tools that will comply with modern requirements for the qualities of the personality of the educator [12; 13]. In addition, notably, technology in education is a global set of tools, universal software and methodological support and most importantly, a digital educational environment. This environment includes huge amounts of information that are available in real-time [14]. Due to this, the learning process can be enriched with a huge amount of accessible and moving information. Based on this, the digital educational environment is an open set of information systems designed to solve various tasks of the educational process.

In addition, consider a variety of interactive online services that can optimise students' learning time. These include e-mail, e-textbooks designed by teachers, workshops and pedagogical dictionaries, and reference books and encyclopaedias. In addition, the organisation of webinars with experienced teachers, mobile applications and chats on WhatsApp are available with the possibility to discuss any issue, get feedback and additional assignments in real-time. Online testing on subjects and courses and links to questions, and quizzes (e.g. Kahoot), are available options. In addition, there are services for checking the uniqueness of researches. Internet resources provide an invaluable base for establishing an informational and subject-specific environment, supporting the educational process and self-study, and meeting the interests and needs of students.

### Conducting a survey among students in the speciality "Pedagogy"

To evaluate the effectiveness of using digital resources in the educational process, a survey was conducted among 127 students. To the question "How effective do you consider using Internet technologies to be?" more than half of the interviewed students believe that this application is necessary, as it meets the modern requirements of world processes. The rest note that the most effective condition for the development of professional competencies will be the expedient use of such technologies (Figure 1).



Answers to the question "How effective do you consider using Internet technologies to be?"

Source: compiled by the authors.

Based on this, it should be concluded that, according to the respondents, it significantly simplifies the process of preparing and conducting classes and makes them more

modernised. In turn, the other students highlight the difficulties in the form of the need for technology, continuous access to the Internet (Figure 2).

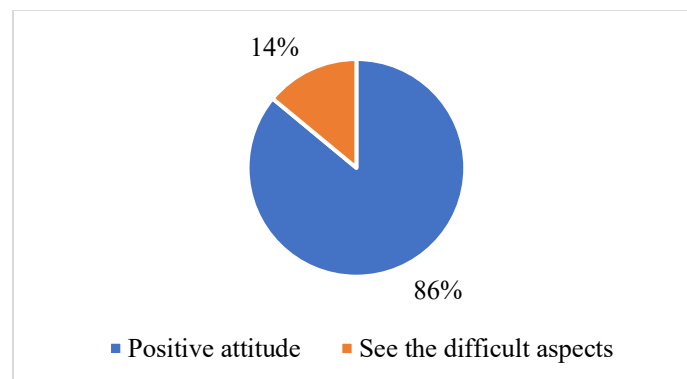


Figure 2. Responses to the question "Do Internet technologies optimise the teacher's work?"

Source: compiled by the authors.

Particular attention was devoted to the opinions on the positive aspects of incorporating technology into learning (Figure 3).

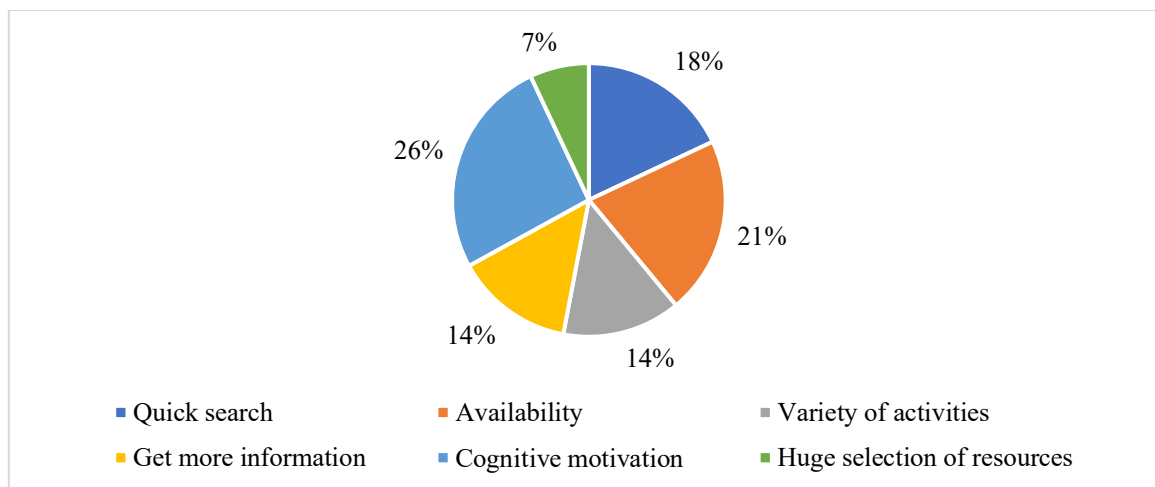


Figure 3. Advantages of Internet technologies

Source: compiled by the authors.

In addition, adverse aspects in using technology in learning were explored (Figure 4).

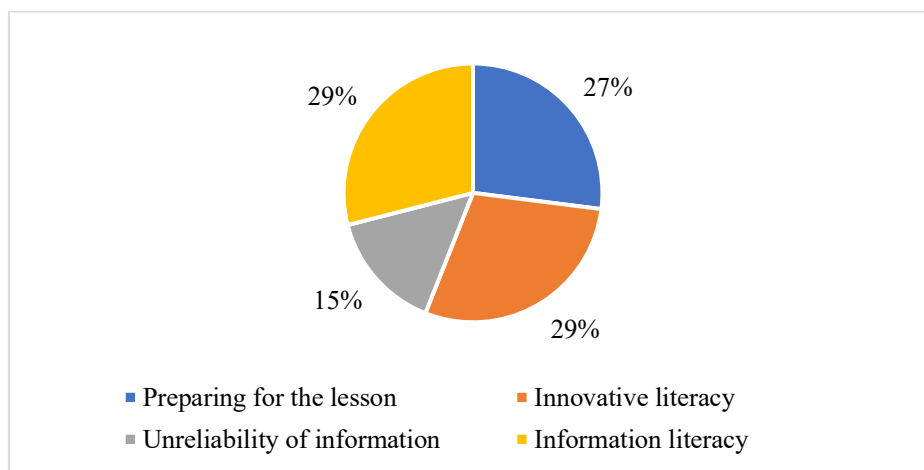


Figure 4. Difficulties in using Internet technologies

Source: compiled by the authors.

The conducted survey allows concluding that teachers' information literacy is an essential component for using Internet technologies in the teaching process. Considering that the educational environment requires modern teachers to develop new forms of interaction with students, the key task is the ability to create and apply appropriate educational content using digital technologies and to possess the skills of searching and selecting effective and reliable Internet resources. Based on the obtained data from the interviewed students, an experiment was

conducted to assess the effectiveness of the development of psychological and pedagogical conditions in students. Two groups were allocated: group No. 1 – 64 students participated, in group No. 2 – 63. In group No. 1 digital technologies were introduced from the beginning of the academic year, namely online courses, artificial intelligence, web quests, online access to the university library, in group No. 2 – after the quarterly certification (Table 1).

Table 1. Effectiveness of developing psycho-pedagogical conditions in students using digital technologies

Group	Performance level at the beginning of the school year	Performance level during the quarterly assessment	Performance level after quarterly assessment	Performance level at the end of the school year
No. 1	57%	63%	76%	95%
No. 2	52%	52%	68%	85%

**Source:** compiled by the authors.

Thus, the provided data demonstrate that the introduction of digital technologies in the educational process is characterised by significant efficiency. It is conditioned upon the fact that it allows students to develop some necessary competences in the conditions of

digitalisation and prepare them to be highly competitive specialists. It is worth considering in more detail the impact of the introduction of digital technologies in the training of future teachers according to the results of the final certification (Table 2).

**Table 2.** Quantitative analysis of the final control

Group	Number of students	Performance level	Quality level	Number of assessments			
				5	4	3	2
No. 1	64	100%	95%	34	23	7	0
No. 2	63	85%	77%	15	25	23	0

**Source:** compiled by the authors.

Thus, the provided data help to evaluate the effectiveness of training future teachers using digital technologies. As it can be noted, group No. 1 was experimental and, accordingly, the educational process was implemented through innovation and communication technologies; the results of group No. 1 are higher in

quality level by 8% in comparison with the other group. Nevertheless, since digital technologies were introduced in the educational process of group No. 2 after the quarterly assessment, it is necessary to evaluate the input and final controls (Table 3).

**Table 3.** Comparative analysis of input and output controls

Type of control	Group	Performance level	Quality level	Average score	Dynamics
Entrance control	No. 1	57%	67%	4	Absent
Final control	No. 1	100%	95%	4.5	Growth dynamics
Entrance control	No. 2	52%	52%	3.5	Absent
Final control	No. 2	85%	77%	3.9	Growth dynamics

**Source:** compiled by the authors.

The results obtained allow identifying several advantages of using technology in the development of professional character skills of future teachers. These include the following: reducing the time of transmission and updating of educational information, making it available to students; simplification of the teaching process and systematisation of the teacher's work through digital applications; the possibility of online testing to control knowledge and skills; providing motivation of stable character of students to explore disciplines; establishing a comfortable learning environment; individualisation of learning; increasing the amount of work done within one class; development of skills of searching and processing information; competent organisation of learning; providing access to different resources; motivating students through using mobile applications; preparing students to use the taught skills in professional implementation according to the processes of digitalisation; developing a high level of information and communication literacy, which is an important component in all sectors. Thus, using digital resources allows solving several problems and establishing favourable conditions for the learning and development of elementary students. Based on the above-mentioned data obtained based on the survey among students, it was concluded that it is necessary to implement the pedagogical conditions through the prism of digital technology application in the process of developing the professional skills of future primary school teachers.

**Psychological and pedagogical conditions of training future primary school teachers in the conditions of digitalisation**

When analysing the problems of pedagogical conditions that contribute to the successful integration of information technologies in education, the significance of psychological, didactic and organisational conditions should be noted. Psychological aspects include the motivation to use technologies in teaching and the desire for self-education. Didactic conditions include the teacher's mastery of foreign language teaching methodology and the ability to apply a differentiated approach in teaching. Organisational conditions assume the presence of an environment that promotes using information and communication technologies in the training of specialists, such as a computer network, the necessary equipment, applications and software [15; 16]. Based on this, the introduction and further application of innovative resources in education are conditioned by the modern requirements of the conditions of globalisation and digitalisation processes. In this regard, the level of requirements for professionals, in particular, teachers, is increasing. It provides an opportunity both to develop professional skills at a higher level and to improve the learning process; it allows developing of the motivation, cognitive sphere and aspects of the emotional-volitional character of the student's personality. One of the most important conditions that determine the effectiveness of technology use is information literacy.

Using virtual reality (VR) in the process of professional training is notable. It allows establishing reality to practice practical skills of interaction with students and parents within the adaptation of students and the work of the class teacher. It should be mentioned that the technical support and usability of virtual reality technology, namely the internet, the availability of VR helmets, the accessibility of the CoSpaces Edu program, and the interface, are positive factors in the introduction of technology in the organisation of the training process [17; 18]. However, it is necessary to mention the disadvantages that may limit the application of VR technology in learning. Among them, a large amount of time needed to design lessons, the high price of subscriptions to design apps, and the lack of availability of the technology in schools are notable. In addition, not all learners can be in a state of total immersion in VR technology, which can lead to decreased concentration, nausea and dizziness. One of the most serious disadvantages is the lack of methodological recommendations on using VR technologies and the need for constant accompaniment by an expert teacher. At the moment, the introduction of such technologies in educational institutions is rather unlikely due to limited funding for education.

Thus, this research provided an opportunity to analyse the areas of development of teacher education in light of the digital transformation of higher education and the need to develop adaptive, practice-oriented educational programmes to train effective modern teachers. Using VR technology to develop the creativity of future teachers is justified by the rapid development of the information-technological environment in which the personality of a modern teacher is developed. It follows that the creativity of future teachers developing in the digital educational environment is based on their ability to design new products using new technologies within the framework of pedagogical activity. The conducted survey allowed identifying several problems faced by future teachers in their professional implementation. Further research will be devoted to exploring the prospects of resolving the problems associated with VR technologies in the educational sector and analysing foreign experience in this field.

## Discussion

The modern world places new demands on education due to digital transformation. On the one hand, it helps to solve some tasks, but on the other hand, it establishes new challenges. The state, IT companies and the pedagogical community have to develop new teaching methods and look for an optimal balance between digital and classical education. Modern students, especially primary school students, already live in a digital environment where gadgets, tablets, smartphones, websites and web services are quite common. In addition to being a major source of information, the Internet is frequently a field of activity. The new UNESCO recommendations “The structure of ICT competence of teachers” reflect the relevance and importance of digital literacy and ICT competence of modern teachers [19-21].

An information and learning environment (ILE) – is a specially organised space that is chosen by the teacher to deliver lessons, such as classrooms, computer labs [22].

F.D. Guillén-Gámez *et al.* [23] write that it includes the materials and equipment chosen by the educator for teaching, such as textbooks, computers and electronic learning resources. Based on this, it follows that to maintain the quality of education, it is necessary to regularly update the educational content, integrate new methodologies and standards, adapt materials to the needs of teachers and students, increase interest in learning and motivate students. A.A.P. Cattaneo *et al.* [24] note that interpersonal relationships between teacher and students, students and computer, teacher and computer, teacher and computer, and facilities play an important role in ILE. The establishment of ILE contributes to the development of future teachers and the implementation of a unified e-learning system. In addition, it helps to improve the quality of educational services and the prestige of the teaching profession, to design teachers of a new development. Notably, the ILE is developed both by teachers and by the students and the teaching staff of an educational institution, as they determine the general requirements for students and the shape of their relationships [25; 26].

Within the framework of the state programme “Digital Kazakhstan” [3], particular attention is devoted to the development of critical thinking in students in the updated educational programme. For this purpose, constructive learning and active learning activities are used, which allow students to independently acquire knowledge, develop social and communication skills, feel their interests and future, make constructive decisions and acquire capable personal qualities. In addition, the educational programme uses various definitions of critical thinking to help students develop word-processing skills, teach communication skills and allow them to draw their conclusions, ask questions and seek solutions to problems. E. Skantz-Åberg *et al.* [27] take the position that the basic principle is that information is not the last but the starting point for critical thinking. From this, it can be concluded that texts are established to enable learners to develop their critical thinking and to identify and solve their problem situations. C. Antonietti *et al.* [28] believe that tasks should be structured in such a way that they can be found and solved, with the teacher requiring evidence from learners when completing tasks. Thus, it is essential to be able to ask good questions so that the answers are based on particular evidence.

According to the position of W.K. Zimmer & S.D. Matthews [29], the concept of “evidence” is a key concept in critical thinking as it requires the defence of a critical standpoint. It should be agreed with this statement as it is an empirical principle that suggests that one should not believe in something without evidence. In this case, students must rely on the facts in the text to make their point and prove their opinion. A game that develops critical thinking promotes communicative, verbal, cognitive, and creative abilities and enhances educational attainment. Scientists use the concept of developing critical thinking, which is not about accepting new ideas without considering their reasons, ways of implementation and results [30-32]. On the contrary, to develop critical thinking, it is necessary to know the basic causes and effects of ideas and integrate them into one’s environment, capabilities, needs, and actions. In addition, looking critically at problem situations and using them to your

advantage is an important aspect of developing critical thinking.

A.R. Pinto-Santos *et al.* [33] believe that the ILE is an integrated multi-component system of digitalisation of education, which includes elements for curricular, extracurricular, research and development activities, measurement, monitoring and evaluation of learning outcomes, and management activities of the educational institution. In this case, it should be added that one of the most important characteristics of the IOS is the integrity, relevance, accessibility and interconnection of all its components, which ensures the systematic integration of ICT in the educational process; this systematicity provided the opportunity to increase the performance indicators in learning during the experiment. J.M. Fernández-Batanero *et al.* [34] express the position that the inclusion of students in an information and learning environment based on an electronic methodological system (EMS) provides the development of methodological preparation of future teachers for using ICT. Based on this, it is reasonable to mention that an important place in this aspect is given to the criteria and indicators of this training in the hypothetical model, which was confirmed during the implementation of the pedagogical experiment. It is essential to note that EMS can perform the function of an information and learning environment if the participants of the educational and methodological process can modulate training information, design an information and learning environment, develop a system of distance interaction and perform automated quality control of training.

As J.K. Andreasen *et al.* [35], one of the new methods of increasing the effectiveness of the process of developing professional competencies of future primary school teachers is the purposeful management of students' personal-activity approach. It is achieved by exploring the regularities of this approach and their application in appropriate methods, means and forms of teaching. Significantly, the relevant effectiveness of this method was demonstrated in the conducted experiment. Digital technologies play a significant role in this process. The introduction of digital technologies into the learning process has two important aspects: firstly, it helps to solve scientific, technical, methodological and organisational problems of training future specialists, and secondly, it is necessary to ensure the high quality of professional competence of each university graduate [36-38]. A very important method to improve the educational process is programmed learning using digital technologies and practical application of automated learning and dialogue exchange of information of training programmes with the participants of the educational process. The principles of individualised learning are applied [39; 40].

J. Cabero-Almenara *et al.* [41] note that the research on using digital technologies in the training of future teachers began in pedagogical science in the 20th century and continues until today in the context of exploring the subject of using information and communication technologies in the teaching process. Within the framework of the programme "Digital Kazakhstan" [3], it is necessary to improve the pedagogical conditions of training future teachers since digitalisation is significantly ahead of the existing requirements of production. It is essential that the teacher, in addition to functional literacy and subject

competence, develops digital competence and metacognition of students. Therefore, the establishment of a digital educational environment is currently at the centre of pedagogy. For example, the "Cluster" method is a method of graphical systematisation of material, which consists in highlighting important information in the form of a graph arranged in a particular order, i.e. a cluster. It provides an opportunity to stimulate students' creativity by developing their critical thinking.

Future elementary teachers who apply critical thinking strategies can develop the creativity of classroom students by using various methods such as establishing a discussion on a particular subject, transforming a problem, comparing similarities of a story, drawing imagination, and describing characters. If critical thinking strategies are applied in the classroom, it will help students learn to ask questions and find arguments in the text to answer questions, be able to solve problem situations, understand the author's main idea and conclusion, and draw conclusions. The ability to think critically is essential for successful study and learning in higher education. Thus, some of the main aspects in the preparation of a highly competitive future primary school teacher are the development of digital competence, critical thinking, digital literacy and other factors discussed above. It provides an opportunity for the future specialist to adapt to the modern conditions of globalisation and digitalisation.

## **Conclusions**

This research was conducted to explore the psychological and pedagogical conditions of training future primary school teachers in the conditions of digitalisation of the educational process. It was noted that due to the active development of innovation and communication technologies and their application in teaching, there is a high demand for training highly qualified future specialists who will provide the opportunity to implement the educational process effectively and qualitatively. For the embodiment of the specified purpose, it is quite remarkable to use electronic scientific libraries, video channels, websites, social networks. The significance of using interactive Internet services that allow optimising the teaching time has been identified. These include electronic workshops, textbooks, dictionaries, organisation of webinars, online testing, and services for checking works for uniqueness.

The most crucial stage in the implementation of the work is the empirical research, which consisted of a survey of 127 students. It provided an opportunity to identify the main advantages and difficulties associated with using digital technologies in the educational process. In addition, a pedagogical experiment was conducted: 127 students were divided into 2 groups, namely – group No. 1 consisted of 64 students and group No. 2 consisted of 63 students. The experiment was based on the implementation of various digital technologies in the educational process and the evaluation of their effectiveness and their direct impact on the effectiveness of learning. The positive aspects included the fact that it allows reducing the time for processing educational information, increasing its accessibility, facilitating the teaching process, systematisation of work, implementation of frontal forms of knowledge and skills control. The key problematic



aspects were identified as unreliable information, low level of information literacy and innovation willingness, and labour-intensive preparation for classes.

Based on this, the need to develop information competence among students, and other psychological and pedagogical conditions was noted. It allows future primary school teachers to be more adapted to globalisation processes and highly competitive. The need to develop these skills stems from the significance of improving the effectiveness of the educational sector in the context of digitalisation. Further research will be devoted to exploring

the prospects of resolving the problems associated with VR technologies in the educational sector and analysing foreign experience in this sector.

### Acknowledgements

None.

### Conflict of Interest

None.

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## **Психолого-педагогічні умови підготовки майбутніх учителів початкової школи з використанням сучасних цифрових освітніх ресурсів**

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### **Анотація**

**Актуальність.** Актуальність дослідження зумовлена необхідністю розгляду фундаментальних аспектів підготовки майбутніх учителів початкової школи в умовах диджиталізації та глобалізації, які постійно вдосконалюються та змінюються, у зв'язку з чим досить важливим є врахування всього комплексу умов для підготовки висококонкурентного майбутнього фахівця.

**Мета.** Мета – проаналізувати психолого-педагогічні умови розвитку майбутніх учителів початкової школи з використанням сучасних цифрових освітніх ресурсів.

**Методологія.** У дослідженні використовувалися такі методи, як логічний аналіз, дедукція, індукція, синтез, функціональний аналіз та метод опитування.

**Результати.** Під час виконання роботи було визначено основні особливості освітнього процесу в умовах цифровізації, надано характеристику притаманних йому елементів та принципів реалізації. Проведено анкетування, в якому взяли участь 127 студентів. Значущість анкетного опитування зумовлена тим, що воно дозволило виявити позитивні та негативні аспекти впровадження інформаційно-комунікаційних технологій в освітній процес, основні проблеми, які виникають у майбутніх учителів. Крім того, на базі цього університету було проведено педагогічний експеримент у 2 групах: група № 1 (64 студенти) та група № 2 (63 студенти). Було розглянуто перспективу впровадження та подальшого використання віртуальної реальності в навчальному процесі. Розглянуто основні складові успішної професійної реалізації майбутнього фахівця.

**Висновки.** Практичне значення отриманих результатів полягає в отриманні інформації про основні труднощі, які не дозволяють ефективно реалізовувати освітній процес у сучасних умовах, у зв'язку з чим надано рекомендації майбутнім викладачам щодо врахування психолого-педагогічних умов для підготовки висококонкурентних майбутніх фахівців та підвищення рівня якості освіти в цілому.

**Ключові слова:** інформаційна грамотність; інтернет-технології; інформаційно-комунікаційні технології; віртуальна реальність; професійні компетенції.