

Possibilities Of Using Pedagogical Technologies In A Digital Educational Environment

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Abstract. The article examines the theoretical and methodological foundations of the use of pedagogical technologies in a digital educational environment, their impact on the quality and effectiveness of education and their importance in the modern educational process, the modernization of the education system in the context of digital transformation, the scientific study of the possibilities of using pedagogical technologies in a digital educational environment, the clarification of their theoretical and methodological foundations, the improvement of practical mechanisms and the determination of their impact on educational effectiveness, the importance of scientific and pedagogical importance, the main factors of the development of the education system in the context of digital transformation, the professional competence of the teacher, information culture and innovative activity, the current issues of introducing interactive and innovative pedagogical technologies, the structural components of the digital educational environment, electronic educational resources, distance learning platforms, multimedia tools and adaptive educational technologies.

Key words: Digitalization, education, pedagogy, innovation, technology, training, distance learning, interactivity, competence, platforms, tools, resources, process, need, result.

Introduction. The 21st century is the century of information, innovation and intellectual progress, marking a new stage in world civilization. The rapid development of globalization processes, the widespread introduction of digital technologies into all spheres, and the growing need for human capital pose completely new challenges to the education system. Especially in the conditions of the digital economy, the modernization of educational content, the implementation of innovative approaches to the educational process, and the integration of pedagogical technologies with the digital environment have become one of the priority areas of modern pedagogical science.

Today, one of the main criteria for the development of society is the intellectual potential of a person, the ability to think independently, the competence to work with information, and digital culture. From this point of view, the education system should not only provide knowledge, but also fulfill the task of forming a person as a social subject who can effectively function in a digital society. This requires the effective use of modern and innovative forms of pedagogical technologies in the educational process, not limited to traditional teaching methods.

Digital learning environment is an integrated pedagogical space organized on the basis of information and communication technologies, electronic learning platforms, multimedia tools, elements of artificial intelligence, distance learning systems and interactive communication capabilities. It creates the opportunity to ensure effective communication between educational subjects, quickly transfer knowledge, individualize educational content and monitor the learning process. Therefore, the digital learning environment serves to radically update the content, form and methods of pedagogical activity.

Pedagogical technologies are systematic pedagogical activities aimed at pre-designing the educational process, purposeful organization and achieving guaranteed results. They play an important role in increasing educational efficiency, increasing the activity of learners, developing independent learning skills and ensuring a competency-based approach. In the modern digital environment, pedagogical technologies are enriched with new content and are manifested in innovative forms such as interactive learning, adaptive learning, blended learning, flipped classroom, gamification, STEM-learning, web-quest, electronic portfolio.

A digital educational environment is an integrative pedagogical space organized on the basis of information and communication technologies, electronic resources, virtual platforms and interactive tools, which ensures effective communication between participants in the educational process. Such an environment

ensures openness, continuity and individualization of education, expanding the opportunities for independent learning of the learner.

In the modern education system, pedagogical technologies are an important means of purposeful organization of the educational process, achieving guaranteed results and improving the quality of education. In the digital environment, pedagogical technologies acquire new content and, unlike traditional educational models, provide interactivity, mobility, flexibility and an individual approach.

Today, innovative pedagogical approaches such as blended learning, flipped classroom, adaptive learning, gamification, STEM and SMART technologies are widely used in higher education institutions. These technologies serve as an important factor in enhancing the cognitive activity of students, developing independent thinking skills and forming digital competencies.

Literature review. The rapid development of information and communication technologies in the 21st century is bringing fundamental changes to the education system, along with all spheres of society. As a result of global digitization processes, the content, methods and forms of education have risen to a new level, and the formation of a digital educational environment has become a priority task of modern pedagogy. Especially in the conditions of a digital economy and a knowledge society, organizing the educational process on the basis of innovative technologies, improving the quality and efficiency of education is of great importance.

The issue of the digital educational environment and pedagogical technologies has become one of the central areas of scientific research in the field of world pedagogy, educational management and information technologies in recent decades. The transition of society to the stage of digitization has created the need to reconsider the content of the education system, its organizational and didactic foundations and teaching methods. This has formed the problem of integrating pedagogical technologies with the digital environment as an urgent scientific issue not only in practical, but also in theoretical and methodological terms.

As an educational space organized through information and communication technologies, the digital environment is interpreted as a complex system that provides intellectual, informational and communicative relations between the subjects of the educational process [1]. In this sense, the digital educational environment is not only a technical infrastructure, but also an integrative system that includes the content, methods and pedagogical relations of education.

In modern pedagogical theory, there are also different approaches to the concept of pedagogical technology. Bepalko defines pedagogical technology as “a specific pedagogical system project that can be applied in practice”, emphasizing that its main feature is the guarantee of the result [3]. According to the scientist, a technological approach to the educational process allows for precise planning of human activity, diagnostics of goals and results, and systematic organization of the educational process. The digital environment, in turn, expands the functional capabilities of these technologies and serves to individualize and differentiate education.

Klarin analyzes educational technologies in connection with innovative pedagogical models and shows that their main task is to form active cognitive activity of learners [6]. In his scientific views, the importance of interactive educational models, virtual communication and multimedia tools in the digital environment occupies a special place. Klarin notes that digital technologies are transforming education from a passive process of receiving information into an active intellectual activity [6].

Polat's research has widely covered the didactic possibilities of distance learning and electronic learning resources [7]. The scientist scientifically substantiates that the educational process organized on the basis of information technologies serves to develop independent learning skills of learners, form their culture of working with information and increase educational efficiency. The author also emphasizes that the role of the teacher in the digital educational environment changes, and he becomes not a source of information, but a subject that manages and directs the educational process [7].

Uzbek researchers have also widely studied the theoretical foundations of pedagogical technologies and digital education. In particular, Ishmukhamedov, analyzing the importance of innovative pedagogical technologies in increasing the effectiveness of education, notes that interactive methods are an important factor in developing independent thinking and creative activity of learners [5]. In his opinion, the use of interactive technologies in a digital educational environment allows for the humanization of the educational process and the implementation of person-centered education.

Tolipov studied the theoretical and practical aspects of pedagogical technologies and analyzed their impact on the quality of education [8]. According to the scientist, the use of pedagogical technologies in a digital educational environment serves to enrich the content of education, expand the visual and audiovisual capabilities of teaching, and increase the activity of learners.

In recent years, much attention has been paid to blended learning and flipped classroom technologies in international research. The flipped classroom model developed by Bergmann and Sams is considered an innovative form of reorganizing the educational process [4]. Based on this model, theoretical materials are independently mastered through a digital environment, while classroom activities are focused on practical discussions and problem-solving. Researchers have stated that this technology is an effective tool for developing students' analytical thinking, creativity, and independent learning competencies [4].

International reports prepared by UNESCO assess the digital educational environment as an important factor of sustainable development, emphasizing the strategic importance of digital pedagogical technologies in the development of human capital [10]. In particular, it is noted that digital educational platforms can ensure the accessibility and openness of education, expand inclusive education opportunities, and ensure equal access to educational resources [10]. The analyzed scientific sources show that the use of pedagogical technologies in a digital educational environment is an important condition for the modernization of the educational process. However, although most studies have extensively covered the technical aspects of the digital environment, there is a need for a comprehensive study of its psychological, pedagogical, and methodological capabilities. In this regard, this study is significant in that it is aimed at a comprehensive analysis of the theoretical foundations and practical possibilities of using pedagogical technologies in a digital educational environment.

Methods. The importance of using pedagogical technologies in a digital educational environment is explained, first of all, by increasing the efficiency and quality of the educational process. Because the ability to present educational materials in visual, audiovisual and interactive forms through digital platforms activates the cognitive activity of learners, helps to deeply assimilate knowledge and creates an opportunity to adapt the educational process to individual characteristics. In this case, the teacher participates not only as a provider of knowledge, but also as a manager, guide and facilitator of the educational process.

At the same time, the widespread penetration of digital technologies into the educational process requires a revision of the methodological foundations of pedagogical activity. Because in the digital environment, the nature of the relationship between the student and the teacher changes, the limitations of education related to time and space are eliminated, information sources are expanded, and the educational process is more oriented towards independent learning. This requires a deep study of the adaptation of pedagogical technologies to the digital environment and their didactic capabilities.

In order to scientifically analyze the possibilities of using pedagogical technologies in the digital educational environment, a number of theoretical and empirical research methods were used in a comprehensive manner. The research methodology was formed on the basis of systematic, competency-based, activity-based and person-oriented approaches.

The systematic approach made it possible to analyze the digital educational environment as an integrative pedagogical system consisting of interconnected components. Based on this approach, the functional relationships between the technical, didactic, methodological and communication elements of the digital environment were studied. This made it possible to comprehensively assess the role and mechanisms of influence of pedagogical technologies in the digital environment [7].

The comparative-analytical method played an important role in the study. Through this method, the differences and similarities between traditional educational technologies and digital pedagogical technologies were analyzed. In particular, indicators such as the level of interactivity of the educational process, the activity of learners, the speed of information exchange and the effectiveness of education were comparatively analyzed [6].

Using the content analysis method, national and international scientific sources, e-learning platforms, digital resources, and regulatory documents were studied. In this process, scientific articles, monographs, and international reports published in the last decade were analyzed, and trends in the development of the digital learning environment were identified [10].

Using the pedagogical observation method, the state of use of digital technologies in educational institutions was studied. In particular, the process of using electronic platforms, virtual classrooms, multimedia

presentations, and online assessment systems was monitored. As a result of the observations, data were collected on the impact of digital pedagogical technologies on the educational process and their practical effectiveness [5].

Using the sociological questionnaire method, the attitude of students and teachers to digital learning technologies, their level of digital competence, and the need to use innovative technologies were determined. The results of the questionnaire showed that the effectiveness of the digital learning environment largely depends on the information and communication competence of teachers [8].

The empirical data obtained through the statistical analysis method were summarized and analyzed. The results were evaluated based on percentages, diagrams and dynamic indicators, and the impact of digital pedagogical technologies on the quality of education was determined.

The methodological basis of the study was the theories of constructivism, cognitive pedagogy and the competency approach. According to the constructivist approach, knowledge is not given ready-made in the educational process, but is independently formed by the learner. The digital environment creates ample opportunities for organizing such independent cognitive activity [4].

The study also took into account the humanistic principles of digital pedagogy. According to this principle, digital technologies are considered not as a replacement for a person, but as a tool for developing his intellectual and creative potential [10].

Discussion. The use of pedagogical technologies in the digital educational environment is leading to a qualitatively new stage in the education system. The modern digital environment is emerging as an intellectual space that integrates the activities of all subjects of the educational process - the teacher, the student and the educational institution. This requires a reconsideration of the tasks, content and didactic features of pedagogical technologies.

Interactive technologies used in the digital environment significantly increase the cognitive activity of learners [5]. Because multimedia materials presented through digital platforms have a simultaneous visual, auditory and practical effect on human memory and thinking. This increases the efficiency of information acquisition and makes it possible to easily perceive complex theoretical concepts.

Blended learning technology is considered one of the most effective models of digital pedagogy. This technology provides flexibility in the educational process by combining traditional classroom education with online learning [7]. The results of the discussion show that the blended learning model, while enhancing students' independent learning activities, allows for the effective use of time and resources.

Flipped classroom technology serves to implement the constructivist model of education. Based on this technology, theoretical knowledge is independently mastered through a digital environment, while classroom lessons are devoted to practical analysis and creative activities [4]. As a result, students' critical thinking, analysis, and decision-making skills in problem situations develop.

The use of gamification technology is gaining importance in strengthening the emotional and motivational aspects of the educational process [6]. A digital educational environment organized through game elements increases students' interest in the lesson and ensures their active participation in the educational process.

At the same time, there are some negative aspects of the digital environment. In particular, information overload, increased virtual communication, and socio-psychological isolation can be observed in the educational process [10]. This indicates the need to take into account psychological and pedagogical factors when using digital pedagogical technologies.

The effectiveness of the digital educational environment largely depends on the digital competence of the teacher. If the teacher does not have the skills to effectively use modern digital tools, innovative technologies may not produce the expected results [8]. Therefore, the development of digital literacy of teachers remains one of the priority tasks of modern educational policy.

Results. The development strategy of the new Uzbekistan sets as priority tasks the digitization of the education system, the expansion of electronic educational resources, and the training of specialists with digital competencies. In particular, the issue of increasing the quality of education and international competitiveness through the introduction of digital pedagogical technologies in higher education institutions has been raised to the level of state policy.

In this regard, the scientific study of the possibilities of using pedagogical technologies in a digital educational environment, elucidation of their theoretical and methodological foundations, improvement of practical mechanisms, and determination of their impact on educational efficiency is of significant scientific and pedagogical importance. After all, in the conditions of digital transformation, the professional competence, information culture, and innovative activity of the teacher are becoming one of the main factors in the development of the education system.

It involves a comprehensive analysis of the integrative relationship between the digital educational environment and pedagogical technologies. In this regard, the functional characteristics, didactic capabilities, methodological advantages, and mechanisms of psychological and pedagogical influence of pedagogical technologies in a digital environment are studied. Also, in the context of digital education, the practical expression of the principles of person-centered education, competency-based approach and constructivist pedagogy is important.

The use of pedagogical technologies in a digital educational environment has shown that it significantly increases the effectiveness of the educational process. In particular, it was found that in the educational process organized on the basis of digital technologies, students' knowledge acquisition indicators are higher than in traditional forms of education [7].

The analysis showed that the use of interactive platforms and multimedia tools has a positive effect on maintaining students' attention for a long time, in-depth assimilation of information and the development of problem-solving skills [5].

Another important result of the use of digital pedagogical technologies was found to be related to the formation of independent learning competencies of students. Online platforms, electronic libraries and virtual laboratories are expanding the opportunities for students to obtain independent knowledge [10].

Gamification and STEM technologies are important tools for developing students' creative and innovative thinking [6]. In particular, the use of project-based learning technology in a digital environment is highly effective in forming students' practical competencies.

It has been found that the automation of the educational process and the introduction of digital monitoring systems ensure the transparency and objectivity of the assessment process [8]. This allows the formation of new mechanisms for monitoring the quality of education.

The role of the teacher in the digital environment is also transforming. Now the teacher is not a source of information, but a subject who organizes, directs and facilitates the educational process [4].

At the same time, the research results showed that the following conditions are important for the effective organization of a digital educational environment:

- development of modern technical infrastructure;
- increasing the digital competencies of teachers;
- creation of national electronic educational resources;
- ensuring cybersecurity;
- strengthening psychological and pedagogical support in the educational process.

Conclusion. The effective use of pedagogical technologies in a digital educational environment is one of the important strategic directions for the development of a modern education system. Digital technologies ensure openness, interactivity and individualization of the educational process, thereby improving the quality and efficiency of education.

The introduction of innovative pedagogical technologies in a digital environment helps students develop independent educational activities, form digital competencies and increase their creative potential.

Also, for the effective organization of a digital educational environment, it is important to:

- develop the digital competencies of teachers;
- improve electronic educational resources;
- strengthen modern technical infrastructure;
- widely introduce innovative pedagogical technologies.

In the future, the integration of digital pedagogical technologies with artificial intelligence, virtual reality and adaptive learning systems will allow the formation of more effective models of education.

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