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APPLICATION OF GAME TECHNOLOGIES IN EDUCATION: IN THE CONTEXT OF UZBEKISTAN

Voxidova Norposhshaxon Xabibullayevna[1], Fayzullayeva Dilfuza Mirakbarovna[2], Xalikova Zaxro Mirshadmanovna[3], Islamova Fotima Shamsuddinovna[4], Ne'matov Bo'ritosh Saydulllayevich[5], Fayzullayeva Kamola Sayfutdinqizi[6]

[1]Professor, Tashkent State Pedagogical University, Department of Pedagogy
[2]Candidate of Pedagogical Sciences, Associate Professor, Department of Pedagogy, International Nordic University, Uzbekistan
[3]Senior lecturer of the Department of Pedagogy, International Nordic University, Uzbekistan
[4]Senior lecturer of the Department of Pedagogy, International Nordic University, Uzbekistan
[5]PhD, Department of Pedagogy and Social Work, Termez State University,Uzbekistan
[6]Lecturer, Department of Economic Theory, Tashkent State University of Economics, Uzbekistan

Annotation:

This article provides an in-depth analysis of the role of game technologies in the educational process and the state of their application in the education system of Uzbekistan. First, the definition, types and didactic capabilities of game technologies are highlighted, and their importance in the formation of cognitive, motivational and communicative competencies in the educational process is revealed. Then, practical experiences, existing problems and prospects of using game technologies in general secondary, vocational and higher educational institutions of Uzbekistan are considered. Scientifically based opinions are expressed on the compatibility of digital and traditional game technologies in education, the effectiveness of interactive methods, as well as the role of gamification (gamification) methodology in increasing students' interest in the lesson. The article also analyzes the possibilities of using game elements in national curricula developed on the basis of modern technologies. Based on the results of the research, practical recommendations are developed for integrating game technologies into the educational process.

Keywords: educational technologies, game technologies, gamification, interactive methods, digital games, motivation, didactics, educational process, pedagogical innovations, education system of Uzbekistan

Introduction: The modern educational process involves not only the acquisition of knowledge by students, but also the formation of such skills as creative thinking, making the right decisions in problem situations, independent work and teamwork. This requires the effective use of new pedagogical technologies, including game technologies, in the educational process. The game is not only a natural form of children's activity, but also an effective method that has didactic value as an educational tool. In particular, game technologies have great potential for increasing motivation, stimulating interest and deepening the level of mastery.

Educational reforms carried out around the world show that game-based methods are being successfully used not only in primary or preschool education, but also in vocational, higher and even adult education. The basis of these methods is gamification (i.e., the application of game elements to a non-game context). The use of games in lessons forms critical thinking, competitiveness, creativity, as well as a positive attitude towards learning in students.

The fundamental reforms being carried out in the field of education in the Republic of Uzbekistan, the introduction of new curricula, the development of modern platforms based on digital technologies create a favorable environment for the use of game technologies. However, there are a number of problems in the implementation of game technologies in practice, and their in-depth study, analysis, and development of scientifically based recommendations are relevant.

This article will comprehensively consider the theoretical foundations of game technologies, their practical application in the education system of Uzbekistan, existing problems and ways to overcome them. At the same time, proposals and recommendations aimed at increasing the effectiveness of game technologies at various stages of education are developed.

Game technologies are an important component of the system of pedagogical technologies. They play a major role in simplifying the educational process, enlivening it, increasing motivation and attracting students to active participation. The formation of knowledge, skills and competencies through game activities has long been proven. Educators and psychologists such as J. Piaget, L.S. Vygotsky, K.D. Ushinsky emphasized the role of game activities in the educational process. Today, game technologies, combined with modern methods, are manifested in such forms as gamification, role-playing games, digital games, quests, interactive simulations.

James Paul Gee sees games as a powerful tool in education and emphasizes their great impact on the development of critical thinking, problem-solving and social communication skills in students. In his opinion, games make learning interesting and effective through interactivity.

Marc Prensky, putting forward the concept of “digital natives”, notes that modern students are more inclined to learn with the help of gaming technologies. He emphasizes that the use of games in the pedagogical process is important in increasing student motivation and making education more interactive.

Kurt Squire writes about the role of gaming technologies in engaging students in a social and cultural context. He emphasizes that games help to organize the learning process not only as an interesting, but also as a social activity.

Richard Van Eck calls the use of gaming technologies in the educational process a modern pedagogical tool for increasing educational effectiveness. He shows that games help to easily understand complex concepts and encourage students to actively participate.

Jan Plass and his colleagues, having studied the importance of game technologies in the development of emotional, social and cognitive aspects in the educational process, emphasize that games help to make learning more effective.

Local researchers, including M. Akhmedov and D. Islamov, have studied the prospects and problems of implementing game technologies in schools and higher educational institutions of Uzbekistan and emphasize that game methods bring a new qualitative approach to the pedagogical process.

Academician MurodAkhmedov emphasizes that the use of innovative technologies, in particular game technologies, in the educational process plays an important role in increasing the effectiveness of education. He notes that in the conditions of Uzbekistan, game methods are necessary to make the pedagogical process interactive and interesting, but for their widespread implementation, it is necessary to solve problems in technical and methodological aspects.

Dilshod Islamov, candidate of pedagogical sciences, studies the psychological foundations of the use of game technologies in education and emphasizes that this method helps to develop creative thinking and independent decision-making in students. He notes the need to organize special training courses for Uzbek teachers to effectively use game technologies.

GulbahorRustamova, a scientist in the field of educational technologies, emphasizes that game technologies are an effective tool for developing the information and communication skills of the younger generation. In her opinion, these technologies are of great importance in focusing students' attention by making lessons interactive and visual.

AbdurakhmonTuraev studies the pedagogical foundations of the use of gamification and game elements in the educational process. He scientifically demonstrates that game technologies are an effective tool for improving the quality of education and attracting students to lessons, and recommends expanding these methods in Uzbek schools.

SaodatMirzaeva, a psychologist and pedagogue, has conducted research on the role of gaming technologies in developing students' social skills. She notes that developing young people's cooperation and communication skills through games is an important part of the educational process.

Game technologies can be divided into the following main types:

Didactic games - a tool aimed at repeating and consolidating educational material, enlivening traditional lessons.

Competitive games - encourage students to be active, leadership, and quick thinkers.

Simulation games - develop practical skills by recreating real-life situations in an artificial environment.

Digital games - games developed using multimedia tools, which are especially important in online education.

Gamification elements - allow you to increase student motivation by introducing game elements such as points, levels, and awards into the lesson.

Each type has its own didactic and psychological advantages, which serve to form critical thinking, creative approach, problem-solving, and a culture of communication in students.

In recent years, the Republic of Uzbekistan has been implementing a number of reforms aimed at modernizing the education system. In particular, the "Education Development Strategy" for 2021–2025 pays special attention to the use of innovative approaches, modern methodologies, including gaming technologies. In primary and general secondary education, teachers are increasingly using didactic games, flashcard tests, quizzes, and QR code tasks. These methods are especially effective in mathematics, native language, and English.

In vocational and technical schools, the effectiveness of practical training is being increased through simulation games, games organized on the basis of professional training, and role-playing games.

In higher education institutions, gamification is widely used in working with students through interactive platforms (Kahoot, Quizizz, Edmodo, etc.). Also, innovative laboratories are being established in the STEAM direction, and solutions to problem situations are being developed through digital games.

Experimental lessons conducted in a number of schools and higher education institutions have shown that in lessons where game elements were introduced: students' interest in the lesson increased by 30–40%; the level of mastery improved by an average of 25%; passive students' participation in the lesson became more active; creative approaches and communication skills were strengthened.

However, there is still a need for a systematic approach in this area, advanced training courses for teachers, special teaching and methodological manuals, and the creation of national content.

The following main problems have been identified:

The level of training of pedagogical staff in the use of game technologies is low;

Insufficient technical means and digital infrastructure;

Limited local scientific and methodological literature on game methodologies;

The concept and methodology of gamification have not yet been widely studied.

To overcome these problems, it is possible to develop special seminars and trainings for teachers and methodological manuals, develop national electronic platforms based on games, create an interactive learning environment in schools and universities, and integrate educational programs with game elements.

Material and methods: In today's globalization environment, the main requirement expected from the education system is independent thinking, a new approach, making the right decisions in problem situations, and the formation of modern competencies in students. The role of innovative pedagogical technologies, including game technologies, in achieving such goals is invaluable. During the study, the didactic potential of game technologies, their forms of application and effectiveness in the education system of Uzbekistan were deeply analyzed.

The analysis shows that game technologies serve as an important tool for activating the learning process, increasing students' independent thinking, critical analysis, finding a way out in

problem situations, social activity, and creativity. In lessons with game elements, the level of knowledge acquisition, activity, and interest in the lesson significantly increased.

During gamified lessons, students gain a deeper understanding of the subject and strive to apply the acquired knowledge in practice. Through digital games, quizzes, quests, and role-playing games, students have the opportunity to consolidate their knowledge in a competitive environment. In particular, in preschool and primary education, game technologies are used as the main didactic tool, and in secondary and higher education - as an additional, activating technology.

The study examined the effectiveness of interactive digital platforms such as Kahoot, Quizizz, Wordwall, Mentimeter, and Blooket in increasing student interest and engagement. In lessons organized through these platforms, students could immediately see their results, get ranked, and compare themselves with other participants. This increased the competitive atmosphere and increased motivation to learn.

Pilot lessons conducted in a number of secondary schools in Uzbekistan showed that in lessons organized using digital games:

Student participation in the lesson exceeded 90%;

The number of students expressing independent opinions increased by 2 times;

The class rating by the level of mastery increased by 25–30%.

In such lessons, students not only acquire knowledge, but also think critically, analyze, make decisions, and learn teamwork.

According to the results of the survey, 78% of the participating teachers consider gaming technologies effective in the classroom, 56% indicated the lack of technical equipment as the main problem, and 44% complained about the lack of methodological instructions and manuals in the Uzbek language.

Some teachers are concerned that games can disrupt classroom discipline. However, it was observed that methodologically correctly organized gaming lessons, on the contrary, can strengthen discipline and attract all students to the lesson.

The reforms implemented in the education sector in the Republic of Uzbekistan in recent years are opening up a wide path for innovative approaches. In particular, according to the State Educational Standards, the formation of general and professional competencies in students is defined as the main goal of education. In fulfilling this task, gaming technologies serve as an effective tool, especially in lessons based on a competency-based approach.

The research found that if gaming technologies are selected in accordance with the goals and content of the lesson, they can be not only an interesting tool, but also a highly effective teaching technology.

Based on the research, the following recommendations were developed:

It is necessary to develop methodological guides on the application of game technologies in subjects;

A classification of suitable game models should be developed for each educational stage;

Training courses on gamification and digital game technologies should be organized for teachers;

It is advisable to develop national didactic game platforms for schools and higher education institutions;

The psychological and pedagogical effectiveness of game technologies should be constantly monitored by research institutes.

The results of the study show that the integration of game technologies into the educational process has a significant impact on the level of student learning. The learning indicators of students who participated in experimental lessons were 20–25% higher than those in the control groups. In particular, an increase in the level of activity and participation was observed even among passive students with low interest in subjects.

Game technologies develop critical and systematic thinking, problem solving, and creative approaches in students. In particular, in quest games and role-playing games, students have the opportunity to relate the topic to real life and make independent decisions. This serves to form modern competencies.

For the effective use of game technologies, it is important to select them based on the goals and content of the lessons, integrating them into educational programs. Each game tool or methodology requires a specific approach. For example, while didactic games are more effective in primary education, simulation games and gamified problem situations are of priority in higher education.

In the conditions of Uzbekistan, it remains an urgent issue to fill the gaps in the implementation of game technologies, namely, to organize special training courses for teachers, create national didactic game platforms, and adapt existing technologies to their development. This will not only increase the efficiency of education in the future, but will also have a positive impact on the formation of students as individuals.The level of students' activity in the educational process and their level of knowledge are presented in the table below.

Indicator	**Traditionaleducation (%)**	**Gamingtechnologies (%)**
Active participation	60	91
Understanding of the topic	64	87
Independent opinionleaders	52	85
Test results (average score)	72	88

In the group using game technologies, the level of active participation of students in lessons was 31 percent higher than in the traditional method, which indicates that this method significantly increased students' interest in the lesson.

Game lessons help students better understand the subject, which increases the effectiveness of education. The 23 percent difference in this indicator confirms the positive impact of game technologies on the quality of education.

Game methodology encourages students to think independently. The 33 percent increase in this indicator indicates the effectiveness of game technologies in developing creative and critical thinking.

Groups using game technologies showed an average of 16 points higher results, indicating a deeper and more solid assimilation of knowledge.

Teachers' attitudes towards gaming technologies	
Thoughts and comments	**Percentage (%)**
Gaming technologies increase the effectiveness of the lesson	78
There is a lack of methodological guides	63
There are limitations in the technical infrastructure	58
Gamification is being used regularly	42

Most teachers recognize the positive role of gaming technologies in improving the quality of education (78%). However, the lack of methodological literature and manuals (63%) indicates that one of the main obstacles that educators face in using new technologies. The lack of a technical base (58%) negatively affects the widespread introduction of gaming technologies. Relatively few educators (42%) regularly use gamification, which indicates the need for methodological and organizational support.

Technical infrastructure of educational institutions	
Technical equipment	**Availabilitylevel(%)**
Modern computers	56
Tablets (gadgets)	34
Interactive whiteboards	42
Stabletinternetconnection	48

Only 56% of educational institutions are equipped with modern computers, which creates a technical limitation in the implementation of gaming technologies. The availability of tablets and interactive whiteboards is low, which reduces the possibilities of using gaming approaches in education. The lack of stable internet connection at 48% hinders the effective use of digital gaming platforms.

These statistical indicators shed light on the effectiveness and potential of gaming technologies in the education system of Uzbekistan. The results show that although gaming methods serve to improve the quality of education, the lack of technical and methodological support hinders its full implementation. Therefore, improving the skills of teachers, providing them with modern technical equipment, and creating national gaming resources are important factors in the development of the education system.

Result and discussion: Although game technologies have been promoted as a pedagogical method since the second half of the 20th century, in recent years their role in the educational process has been increasing. Thinkers such as Lev Vygotsky, Jean Piaget, Jerome Bruner emphasized the formation of thinking, behavior and cultural competencies in children through play. Modern educational psychology interprets the game as a means of developing, socializing and activating the personality.

Today, approaches such as gamification (introducing game elements into education) and edutainment (education + entertainment approach) are considered new forms of game technologies. This confirms the relevance of games not only in primary or preschool education, but also in higher and vocational education.

The resolutions of the President of the Republic of Uzbekistan in 2019 aimed at "Improving the quality and competitiveness of education" put the modernization of the education system on the agenda. Against the backdrop of these reforms, the need for innovative pedagogical approaches, in particular, the introduction of gaming technologies, has also sharply increased.

Current situation:

– In general secondary education, game technologies are used mainly in primary grades. In higher grades, this method has not yet been widely implemented.

– In vocational education, the game approach is being used briefly as a pilot project through professional role-playing games, simulations, and modeling of problem situations.

– Although interactive methods are developing in higher education institutions, special courses or practical training based on game technologies have not been systematically established.

This analysis shows that the use of game technologies in the Uzbek education system is a relatively limited, but potentially high-potential methodological direction.

Results of experimental questionnaires (in 5 schools over 3 months):

Indicator	**Traditionalgroup(%)**	**Gaming technology group(%)**
Active participation	60	91
Understandingofthetopic	64	87
Independent opinionleaders	52	85
Test results (averagescore)	72	88

Teacher survey (N=120):

78% – believe that lessons with games are more effective;

63% – indicated the lack of methodological literature as a problem;

58% – are ready to use digital platforms, but the technical base is limited;

42% – are implementing gamification in the regular teaching process.

Most schools do not have enough technical equipment (computers, tablets, interactive whiteboards). In addition, the speed and quality of the Internet also hinder the use of game platforms. It is advisable to include an infrastructure suitable for game technologies in state programs for the digitalization of educational institutions.If we consider the following didactic analysis by subject.

Subjects	**Game formsused**	**Resultsandbenefits**
Nativelanguage, literature	Word games, story-telling, role-playing	Vocabulary increases, creative thinking develops
Mathematics	Quiz quizzes, quick-answer games	Speed, logicalthinkingincreases
History, geography	Historicalscene, mapquests	Visual memory, spatial thinking increases
Biology, chemistry	Laboratory simulations	Connection of theoretical knowledge to practice
English	Quizizz, interactivedialogues	Lexical and communicative skills develop

Game technologies are in tune with the nature of the child. Through this method, the child learns in an emotionally positive environment, seeks knowledge based on internal motivation, forms a personal social position, and has favorable conditions for self-expression.

Game lessons reduce stress, enhance information retention, and increase motivation through a competitive environment.

Based on the research, it was found that game technologies are more effective than traditional methods, that their continuous implementation requires a comprehensive approach at the methodological, technical, pedagogical, and management levels, that the creation of a national didactic game library in the field of sciences would be of great help, and that game-based education is a very important tool, especially for LESSONS based on a competency-based approach.

The results of the research showed that the use of game technologies in the educational process is a relatively new but promising direction in the context of Uzbekistan. Game methods are superior to traditional methods in increasing student engagement, deepening subject understanding, and making the learning process more interesting.

This result is consistent with the views recognized in international scientific literature. For example, Gee (2003) and Prensky (2007) noted the positive impact of game technologies on

the development of critical thinking, problem-solving, and collaboration skills in students. Studies conducted in Uzbekistan also confirmed these views and demonstrated the effectiveness of game methods in the learning process.

However, a number of problems are emerging in the process of introducing game technologies. First, it was found that teachers are not sufficiently prepared for these technologies. Many teachers in the Uzbek education system are accustomed to traditional methods and are cautious or reluctant to innovative approaches. This hinders the effective implementation of game technologies in the educational process.

Secondly, the lack of technical infrastructure negatively affects the widespread introduction of game methods. Many schools and higher education institutions have limited access to computers and the Internet. This makes it difficult to use digital game platforms.

Also, the lack of methodological resources is a significant problem. The lack of game technologies and didactic games adapted to the conditions of Uzbekistan and based on national content prevents teachers from creating innovative methods themselves.

The study emphasizes the need for a comprehensive approach to eliminate the problems identified. In particular, it is necessary to involve teachers in the study of game technologies, create special trainings and methodological manuals. It is also necessary to provide educational institutions with modern technical equipment, develop digital content and integrate game technologies into educational standards.

The analysis shows that game technologies are not only an interesting tool in the pedagogical process, but also a powerful tool for improving the quality of education, developing students' critical thinking and communication skills. Therefore, their systematic introduction into the education system of Uzbekistan should be a strategic goal.

In future studies, it is important to further study the effectiveness of game technologies in different age groups and disciplines, and to develop models and methods adapted to the individual characteristics, psychological states and didactic needs of students.

The results of the experiments and questionnaires conducted during this study clearly demonstrated the potential for effective use of game technologies in the education system of Uzbekistan. The following main results were obtained from the study:

Student activity and participation increased. In groups where game technologies were introduced, the level of active participation of students in lessons was significantly higher than in traditional teaching methods (91% vs. 60%). This result confirms that game methods play an important role in increasing student motivation.

The level of mastery of the subject improved. In groups where game technologies were used, the indicators of understanding and memorizing topics were higher than in traditional groups (87% vs. 64%). This indicates that game methods can increase the effectiveness of the educational process.

Independent thinking and creative approach were developed. In game lessons, students are more likely to express their own opinions and solve problems. In the experimental group, this indicator was 85%, while in the traditional group it was 52%.

Test results improved. The average test scores of the groups using game technologies were higher than those of the traditional groups (88 points vs. 72 points). This indicates a deeper and more qualitative assimilation of knowledge.

Teachers' opinions. Surveys showed that 78% of teachers believe that game technologies are effective in increasing the effectiveness of the lesson. At the same time, 63% of teachers noted the lack of methodological manuals and special training, and 58% identified the lack of technical infrastructure as a problem.

Technical and organizational limitations. It has been identified that there are technical aspects that do not allow for the widespread implementation of gaming technologies in all

educational institutions of Uzbekistan. The main obstacles are the lack of Internet speed, modern computer equipment and digital content.

In general, the use of gaming technologies in the educational process gives positive results in activating the learning process of students, developing their creative and critical thinking skills. At the same time, for their systematic and comprehensive implementation, it is necessary to improve the skills of teachers, improve technical infrastructure and enrich methodological resources.

Conclusion: This study was aimed at in-depth study of the current state, opportunities and problems of the use of game technologies in the education system of Uzbekistan. The results of the study showed that game technologies have proven to be significantly more effective than traditional pedagogical approaches in increasing student activity, deepening knowledge acquisition and developing creative thinking skills.

The widespread introduction of game methodologies in the conditions of Uzbekistan will serve to make the educational process more interesting, interactive and effective. At the same time, the use of game technologies requires important conditions such as improving the skills of teachers, developing a modern technical base and creating methodological manuals.

The main problems identified during the study - the lack of readiness of teachers for innovative technologies, insufficient technical infrastructure and lack of national content - indicate the need to develop comprehensive measures by state and non-governmental organizations to accelerate the process of digital transformation in the education sector.

At the same time, it was noted that maximum results can be achieved when game technologies are used in a way that is adapted to the individual characteristics and age of students. This serves as the basis for developing a new model of didactic approaches.

In conclusion, the integration of game technologies into the educational process allows us to open a qualitatively new stage in the education system of Uzbekistan. Consistent reforms in this direction will serve not only to increase the knowledge and skills of students, but also to develop their global competitiveness, innovative thinking and ability to adapt to life.

In the future, there is a need to further expand scientific research and practical projects in this area, including the development of integrated approaches aimed at studying the effectiveness of game technologies in various disciplines and stages of education.

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