World Journal on Educational Technology: Current Issues

Volume 15, Issue 4, (2023) 395-410

www.wj-et.eu

Application of effective methods in the educational process based on innovative, interactive, and game technologies

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Suggested Citation:

Nurgaziev Y. U. & Abdykadyrov A. A. (2023). Application of effective methods in the educational process based on innovative, interactive, and game technologies. *World Journal on Educational Technology: Current Issues*. *15*(4), 395-410. https://doi.org/10.18844/wjet.v15i4.8820

Received on June 12, 2022; revised on August 22, 2022; accepted on October 22, 2023.
Selection and peer review under the responsibility of Prof. Dr. Servet Bayram, Medipol University, Turkey

Abstract

The article aims to examine the content and effectiveness of educational technologies in the educational process. In the study, a combination of methods including literature analysis, synthesis, induction, deduction, generalization, and design were employed. The article provides a brief overview of interactive, game-based, and innovative educational learning technologies, analyzes research on their effectiveness in various age groups of children and adults, and explores their potential for individuals with disabilities. The study also identifies the conditions necessary for the effective utilization of these technologies in the educational process. Based on the findings, it is concluded that these technologies have the potential to enhance learning outcomes and meet the diverse needs of learners. Recommendations for future directions include further research on the optimal integration of these technologies and their continuous adaptation to keep pace with evolving educational requirements.

Keywords: Educational process; game technologies; innovative technologies; interactive technologies.

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1. Introduction

The application of effective methods in the educational process is crucial for enhancing learning outcomes and meeting the evolving needs of learners. In today's digital era, innovative, interactive, and game technologies offer promising opportunities to engage students and create immersive learning experiences. These technologies provide a dynamic and engaging platform that can effectively capture the attention and interest of learners, leading to improved knowledge retention and skill development. Incorporating innovative technologies, such as virtual reality, augmented reality, and simulations, allows students to explore complex concepts in a visually stimulating and interactive manner (Udeozor et al., 2023; Oyelere et al., 2020).

Interactive technologies, such as smart boards, educational apps, and online collaboration tools, enable active participation and real-time feedback, promoting student engagement and fostering a collaborative learning environment (Brom et al., 2019). Game technologies, including gamified learning platforms and educational games, offer an enjoyable and motivating approach to education, making the learning process more engaging and rewarding (Elimelech &Aram 2019; Pozo-Sanchez et al., 2022). The integration of these technologies requires careful consideration of effective methods to ensure their optimal utilization in the educational process. Educators need to be equipped with the necessary skills and knowledge to effectively implement and leverage these technologies. Furthermore, adequate technical support and infrastructure play a crucial role in facilitating the seamless integration and operation of these technologies in educational settings.

1.1.Literature Review

The education system requires constant improvement and updating of the content, technologies, and methods of teaching. At the moment, there are many developed teaching methods and technologies, the use of which, according to the results of the experiments, is more successful than traditional teaching methods. According to the authors (Dudukalov et al., 2015; Sutherland et al., 2023): “The current problem of the modern domestic education system is the inability to ensure the rapid accumulation of modernization potential.” The development of artificial intelligence and computer technologies predicts the decline and even the disappearance of many professions (Zakharova et. al., 2022). But artificial intelligence does not lend itself to such human qualities as the ability to reason, empathy, or emotional intelligence, that is, purely human qualities. According to the results of the World Economic Forum survey of 2020 for today, the most important skills for an employee are critical and creative thinking, creativity, the ability to manage people, to cooperate, cognitive flexibility, critical thinking, emotional intelligence, the ability to negotiate (Shatunova et al., 2019), that is, in turn, developed so-called “soft skills”. To have such skills, it is necessary to introduce such forms of training that contribute to their development. Today, it is not enough just to know the subject well, these are so-called hard skills, it is important to apply this knowledge in life, to be able to interact with other people, and to find the most profitable application of a variety of knowledge and skills in life (Ahmadova and Huseynova, 2017).

A characteristic feature of the modern development of society's transition to a new stage of formation of an innovative society is to build an economy based on the generation, dissemination, transfer, and use of knowledge. The ability to adapt abilities to constantly changing conditions becomes the leading direction, the main source of material prosperity of civil society (Ahmadova et al., 2017).

Investing in intellectual capital becomes the most efficient way to conserve and distribute resources. The intensification of production and the use of new scientific and innovative approaches determines the acceleration of the pace of promoting the integration of science and education into the world's scientific and educational space (Pinchuk et. al., 2022). The place of Azerbaijani universities in the world rankings is not yet adequate to the existing intellectual and educational potential. Further preservation of the current situation may lead to the loss of prospects for the growth of the competitiveness of universities in the world rankings (Alimbaeva et.al., 2018). For adolescents, the choice of a profession is an important psychological and ethical choice that implies certain responsibilities, since adolescents gain a clear understanding of the fact that the intention and fullness of their conscientious adult life depends on their correct choice of profession (Karipbayev et al., 2014; Grebenyukov, 2014; Semenova, 2021). To determine how to develop the necessary skills in the learning process of children and adults of all ages, we will consider the nature of the techniques and technologies used in teaching, their differences and similarities, the use of such forms of learning technologies, which contribute not only to learning but the development of soft skills. We should also not miss the fact that today the opportunities for education with the use of innovative and interactive technologies have been significantly expanded especially in technical courses (wang et al., 2022; Bertram, 2020). So, people from different countries, with different living conditions, and finally, people who could not study well due to limited physical abilities, can study at the same level as other people and even better. So, let's consider the essence and content of various educational technologies, their forms of application, and research on their effectiveness for education.

The term educational technology is considered a special learning technology and a technological approach to learning (Baklagova, 2019). The technological approach provides for the systematization of the educational process into theoretical, constructive, and descriptive schemes. As Ponomariova (2016) writes: “Learning technology is: 1) the field of academic research that studies the effectiveness of learning; 2) the organizational concept of learning technology. This is a method of organization and a model of the educational process that guarantees the achievement of the desired result.” Today, there are such definitions of types of technologies: passive-when the teacher is a priori a source of knowledge that students learn, when the teacher or mentor encourages students to act, to activate attention and interaction, and interactive - when not only the student interacts with the teacher, but also the students among themselves.

Toksonbaev and Nurgaziev’s (2019a) research on information and communication technologies is interesting. The authors emphasize that information and communication technologies play a role an important role in providing conditions for a holistic peace and survival of communities, individuals, and the entire world community. Exchange of information in the field of education in the field of electronic communication, Internet, e-mail, teleconferences, and telecommunication systems. The use of information technologies, depending on the timing, gives remarkable results. The use of electronic textbooks in any lesson will not only increase the awareness of students but also create a system of logical thinking that will work creatively. The use of Information and communication technologies is crucial for the development of a competitive national education system and its permanent participation in the global environment.

The author (Baklagova, 2019), writes: “Interactive learning technologies are considered as a modern stage in the development of active technologies. They are more progressive and efficient than active technologies.” Innovative technologies are new forms of teacher-student interactions. Most interactive technologies can be attributed to or combined with innovative ones. In turn, the active and

interactive ones include both game-based learning technologies and innovative ones. Also, each type of technology has different forms of application. For example, innovative technologies can be used in class or audience - different forms of teacher interaction with students or forms of training, the inclusion of computer technology in the process as a supplement, but it is fully automatized when the student interacts with the laptop as a source of knowledge. So, this approach can be attributed to passive methods of learning.

Abdykadyrov (2016) emphasizes that changes taking place in society by modern requirements, and innovative technologies, which are widely penetrating, have affected all levels of pedagogy. Among them, musical education was not left out. According to scientists, the use of national folklore and local traditions in the process of musical education instills national culture in children, providing information about the culture and life of our country by forming the first ideas about musical art, and forming important changes in the growing generation. The basics of musical education for a child must begin from preschool age - a modern scientifically proven theory. For the development of musical abilities, the pupil must have the experience to feel the musical rhythm, to receive emotions, and to distinguish between musical genres. Music and society have close interaction, and the pupil, not isolating himself from society, develops along with society. His musical development also develops in parallel with the public (Abdykadyrov, 2019). Therefore, the more public information is produced in it, the more the musical zone develops and forms. Currently, musical and educational work in preschool institutions is carried out not only with the use of special programs for musical education but also with the introduction of national folklore and folk traditions. In this context, the main task of preschool institutions remains the thorough familiarization of children with folk music: thereby developing in them creative initiative and conscious activity, perceiving values and cultural heritage that meet the needs of society.

Today, modern preschool education introduces the project method into the educational process. The use of the project method in music lessons directs children to research activities and develops cognitive and creative skills. In our fast-paced age, these qualities help children navigate in the search for information, the development of independent creative thinking, and the use of knowledge gained in the process of project activities. The use of the project-research method in musical education makes it possible to develop and form cognitive and creative abilities in children, unites the team, and establishes a connection with the surrounding society (Abdykadyrov, 2018,2020).

No less relevant scientific conclusions about innovative technologies in the educational process were described by Toksonbaev and Nurgaziev (2020) in their research. In particular, in the scientific research on Innovative technologies in geography lessons at school, the author claims that along with the ideas of personalization and hybrid learning, design method, competency-based approach, problematic learning, interactive methods, project methods combined with e-learning technologies as the basic digital technologies should be used to break routines in the teaching-learning process and to achieve better results in geography classes. An important part of the effective process of introducing innovations in the education system should be the work with teachers as key persons in the overall effectiveness of education. To efficiently implement an innovative approach to learning, the teacher must not possess the methodology, but the skills of organizing and using innovative technologies. Moreover, given the possibility of the emergence of innovative resistance, the task of revealing the importance and subsequent popularization of innovation in the teaching staff lies on the shoulders of the head of the educational institution.

Toksonbaev and Nurgaziev (2019b) believe that today, when analyzing the data of educational activity, it is clear that the following technologies are most often the basis of the innovative process: developmental training, problem-based training, development of critical thinking, etc. The "Project Method" technology is even better. A differentiated approach to learning, creating a situation of success in the lesson of children's integration consists of seven modules of the program of level courses. The use of these technologies in lessons has great advantages. The learning process for students becomes more interesting, which increases the activity of students, and develops skills to independently acquire knowledge in the process of interaction and search. The quality and strength of the acquired knowledge increases. Research skills and abilities are developed, and students' analytical abilities are formed. In parallel with the learning process, the development of communicative qualities and the formation of leadership qualities of a person.

Also, there are computer game technologies, in which students interact with the computer during the game, but actively, search for information, and create diagrams and presentations, which improves active attention. This is one of the types of innovative learning - programmed learning is one of the types of innovative and interactive methods. This method allows you to learn at your own pace. It includes two varieties, 1) computer-based learning when the computer acts as an auxiliary tool, and computer-instructions learning while using the computer entirely. Currently, there are a large number of interactive teaching methods, they are significantly modernized by the inclusion of computerized technologies, the introduction of a variety of online instructional platforms, and other methods (Bulkani et. al., 2022). An effective learning technology that is not new but is constantly being modernized, and its application is always relevant, it is called TRIZ (Theory of Inventive Problem-Solving) (Takafuji, 2019). When students learn to use these research methods, they train their minds differently (which is the original reason for introducing the disciplines) and they are more likely to develop disciplinary skills - a form of deep learning that has become particularly important in recent months when the virtual component of the educational space and, as a result, the educational environment have become much more pronounced (Pylkin et al., 2019).

The results of numerous studies on the effectiveness of the implementation of certain technologies show positive results. According to research (Zhao, 2020), the use of interactive games creates the best conditions for students. Other researchers have shown that one of the most effective training technologies is a combination of game and training methods. The use of game methods allows you to master the material in a short time, and training - to gain skills and abilities in behavioral aspects, to properly convince, discuss, and so on (Novik, 2016). The researchers correctly note that the effectiveness of the use of game technologies in the primary education system that they studied will be achieved by considering the conditions for organizing the game training and development activities of primary school children (Kharabajah, 2020). That is, the use of technology is effective, considering certain conditions. Research by Liubych et al. (2020) shows the effectiveness of using interactive teaching methods in English lessons in primary school. The researchers used brainstorming methods, creating projects and thematic publications, and interactive work in groups. Methods and content are selected according to the age and interests of students, which can also be attributed to the conditions for the introduction of technology in the educational process. According to the results of researchers (Ni, 2013), the performance of students who studied online and in real-time attendance is the same. Two experiments conducted by the author (Dongsong, 2005) show that in a fully interactive e-learning environment based on multimedia, students achieved better results than students in a traditional classroom. The researchers proved the effectiveness of using the method of the metaphorical business game method in the course of economic disciplines, among other interactive methods. Since

communication is an irreducible parameter of human existence, we should talk about the ideological impasse of the concept of intertextuality and the disintegration of the ideological structure of the information society (Ivanova and Sorokina, 2020). Moreover, virtual tours can also be useful. The technique of the tour shows these objects, which includes parallel author's comments and recommendations on working with them and their visual impact on the viewer.

Portnova (2016) explores the three semantic variants (chronological, thematic, complex) of theater excursions. The primary focus of this work is to present innovative approaches that enhance the comprehension of the material, aiming to support guides in their active engagement with the audience. Furthermore, the study highlights the profound impact these approaches have on the personal growth and cultural enrichment of adolescents. Alongside norms, ideals, values, and symbols, cultural wealth stands as a crucial component of human culture. It molds a distinct lens through which individuals actively perceive and interpret the world, ultimately shaping their actions within it (Alimbaeva et al., 2018).

Current research is the application of effective methods based on innovative, interactive, and game technologies in the educational process. These approaches have the potential to revolutionize teaching and learning by fostering student engagement, promoting active learning, accommodating diverse needs, and bridging the gap between theory and practice. As education continues to evolve in the digital age, educators and policymakers must embrace these innovative approaches and harness the power of technology to create meaningful and impactful learning experiences for all students. However, despite a considerable body of research already conducted in this area, there is still a need for further exploration and understanding of effective approaches, methodologies, and strategies for implementing these technologies.

1.2. Purpose of study

The purpose of the present article is to study the content and effectiveness of the technologies in the educational process and to indicate the necessary conditions for using innovative technologies in the process of education and effectiveness for children.

2. Materials and Methods

The research design for this study involved a literature analysis using various methods, including searching databases such as Scopus and Google Scholar. The analysis incorporated methods such as synthesis, induction, deduction, generalization, and design. These methods were employed to gather relevant information about interactive, innovative, game-based, and modular learning technologies, including their features and the combination of different technologies or their integration into teaching practices.

2.1. Data collection

The data collection process focused on gathering literature that evaluated the effectiveness of specific technologies and methods used to assess educational technologies in general. The research encompassed both quantitative and qualitative studies to provide a comprehensive understanding of the topic. Data analysis involved a systematic examination of the collected literature, extracting key findings, and identifying common trends and themes. The analysis aimed to synthesize and generalize the information to draw meaningful conclusions and insights.

2.2. Ethics

Ethical considerations were considered throughout the research process. This involved ensuring that proper citation and referencing practices were followed to uphold academic integrity. Moreover, the study adhered to ethical guidelines by obtaining literature from reputable sources and acknowledging the original authors' contributions.

2.3.Analysis

The validity and reliability of the data were addressed by critically evaluating the quality and credibility of the selected literature. This involved considering the authority and expertise of the authors, the rigor of the research methods employed in the original studies, and the consistency of the findings across multiple sources. The research design employed a literature analysis approach using various methods to gather and analyze information about interactive, innovative, and game-based learning technologies. The ethical implications were considered, and steps were taken to ensure the credibility and validity of the data collected from reputable sources.

3. Results

As well, researchers pointed to the same level of knowledge among students who study online and “live” ones, who go to lectures. But it should not be noted that the studies do not indicate the age of both students, which can be a key, because adults who need a second education can study online, or those who work and want to improve their professional skills. Conscious choice of study always affects the results of learning, and learning in this case is always more effective than forced learning. Similarly, with the interest of children and adolescents - if they are interested in learning - the results of their studies will always be better than when they are forced to learn. The use of interactive methods cannot replace traditional ones, but their systematic and thoughtful application activates attention, promotes the formation of their opinions, and encourages students to actively search for solutions to problems, in short, to learn (Ryabinina, 2016). The use of interactive technologies in which social interaction is considered the most important resource of education significantly increases the developing potential of learning, which ultimately improves the quality and effectiveness of learning in general. The negative consequence of interactive passive learning is the inability of children who are trained in this way to work independently. Children or students get used to the fact that everything is flashing on the screen, and the material is presented brightly and colorfully, but their degree of productivity without such elements significantly decreases. It happens due to the peculiarities of perception, when a person looks at the screen, he does not activate certain special brain centers that are responsible for creating cause-and-effect relationships. Also, developers and users of interactive passive technologies need to remember that long-term viewing of bright web scenarios of any meaning can contribute to the hyperactivity of children. Therefore, the use of interactive passive technologies should be very moderate and desirable for children of middle and high school age and older (i.e., older children, students, and adults).

Consider the possibilities of using interactive technologies for people who have lost the ability to work due to injury or lifestyle changes. The use of such technologies for professional rehabilitation is very relevant because first, you can study or work in the process of rehabilitation without being in the workplace. Then going to work will not be accompanied by stress, on the contrary, it can contribute to a greater passion for the knowledge necessary for work. Also, the use of interactive innovative educational technologies for people with disabilities is still a very little considered topic for study. So,

the authors (Miethlich et al., 2018), absolutely correctly state that after an injury or serious illness, it can be very difficult or even impossible. The restoration of professional skills allows people with disabilities to remain well-off and independent, and research shows that working people recover almost twice as fast as non-working people. Indeed, employment, the ability to provide for themselves, contributes to the improvement of economic and social indicators of human life. It opened new opportunities, and new knowledge, therefore, the quality of life improves significantly. According to the authors, the employment of people with disabilities can contribute to the success of the company (Miethlich et al., 2019a). For an employee with disabilities to have a good education, a proper step–by–step approach is to teach children with disabilities from childhood, as well as teach people who have limitations due to injury or illness. Of course, in the conditions of both schools and organizations, it is necessary to raise and even create an environment that promotes the acceptance and positive attitude of children with the employment of people with disabilities in the team, which is often absent. Moreover, family circumstances can negatively affect the development of the child. Following divorce, people can experience psychological distress which is influenced by the effects of PTSD from past trauma, and whether they used problem-focused coping and were able to manage their emotions (Alimbaeva et al., 2018; Grekova, 2015). But let's move on to the main topic. Interactive and innovative training contributes to rapid vocational rehabilitation, and this, in turn, significantly reduces his worries about material security (Miethlich et al., 2019b) and socialization in general.

One of the innovative educational technologies is the technology of modular learning. Modular learning technology contributes not only to the successful development of educational material, the formation of independence, and teamwork but also has a health-saving effect, as it prevents failure by rationalizing the pace of learning. The research shows many advantages of modular learning technology, and it is used today almost all over the world for studying at different ages and institutions. Modular learning technology is one of the varieties of innovative modern technologies (Khudoley et al., 2016). Its essence is to study the necessary amount of knowledge on the subject in blocks, in stages. Many researchers have proven the effectiveness of such training, at different ages of students, and in different institutions. And inside the modular technology, different types of interactive, innovative, and gaming technologies are used in the form of lectures, classes, and the use of various programs and equipment. Let's consider the types and content of interactive methods, and their application. Currently, there are many scientific studies and articles on the topic of interactive teaching methods. Exploring their diversity, types, and orientation, we tried to classify them by type of application, as well as by format. There is interactive learning in the class (audience), as well as online interactive forms of learning, and those, who use interactive software in the classroom, auditorium, or even in preschool. So, Table 1 shows the types of interactive, gaming, and innovative educational technologies.

Table 1

Forms of teaching and varieties of interactive teaching methods

Forms of holding No	In the audience	In the audience using interactive software	Computer programs	
			With the participation of a teacher	Teacher's non-participation
1	A problem lecture	interactive	Webinar	Online

		whiteboard		
2	Mini lecture	Presentations	Seminars	
3	Lecture-provocation		Zoom lessons and conferences	Sites: https://interactivesites.weebly.com/ https://www.e-learningforkids.org/ https://mtlc.nuiteq.com/sign_up https://www.getcleartouch.com/interactive-displays/ https://flipgrid.com/ https://hyperdocs.co/about_hyperdocs https://www.peekapak.com/ https://edu.google.com/
4	Lecture-press conference		Skype lessons and conferences	
5	Lecture together (binary)			
6	Lecture-visualization			
7	Brainstorming session			
8	The case study method			
9	Decision tree			
10	SOFT technology			
11	SWOT analysis			
12	The method of analyzing specific situations (Case study)			
13	Role-playing game			
14	Applications: "chatium", applications of schools and universities			Applications: “chatium”, applications for schools and universities
15	Simulating real professional situations			

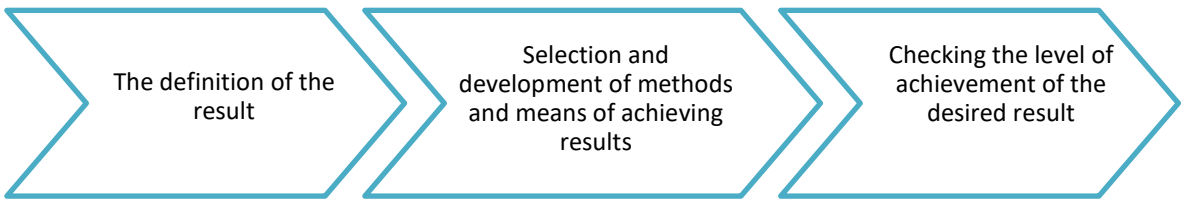
The variety of interactive technologies is very large, and the rationality of using a particular technology should be determined by the goals of learning in general, the content of the subject, and age, which we will consider in the next chapter. Summing up this subsection, we can conclude that for the rational distribution of the content of educational material, a modular technology is used, in the process of implementation of which both passive and active, and interactive, games, and innovative technologies are used to achieve the goal of mastering knowledge (hard skills) with the simultaneous development of the ability to interact with people (soft skills).

Consider the research on the effectiveness of the use of certain technologies in the educational process. Evaluation of the effectiveness of educational technologies. In the scientific and methodological literature, there are few studies on the effectiveness of the use of certain technologies. Most of the conducted efficiency studies show positive learning outcomes, mainly based on the results of testing students' knowledge. However, there aren’t many studies about evaluating

effectiveness. An interesting study was conducted by the authors (Panfilova et al., 2019) and it described the evaluation of the effectiveness of interactive game educational programs for additional education. The authors investigated the goals set by the educational program, based on which the interactive learning program is developed. it is necessary to determine at the beginning what kind of learning result we want to achieve, choose methods and means to achieve the desired result and check the level of achievement of the desired result due to the application of the developed methods (Figure 1).

Figure 1

Methodology for evaluating the effectiveness of educational technologies



3.1. Designed according to the authors' data

This is a very simple, clear methodology for evaluating interactive, game-based learning technologies for students of all ages. Also, the authors (Panfilova et al., 2019) considered two models for evaluating instructive technologies according to the point system. evaluation by points according to the developed criteria the criteria for the effectiveness of training programs to achieve the result are evaluated by points (8 indicators, score from 1 to 5 points), and the algorithm for evaluating programs according to the Kirkpatrick model– evaluating the four stages of the impact of an innovative program on the desired pedagogical result according to the so-called key performance indicators. These indicators can be implemented in the subject, age, and students, which significantly universalizes such a model for evaluating any educational program. According to the author (García-Peñalvo et al., 2018), the evaluation of educational software should be carried out using mixed methods that combine qualitative and quantitative assessment methods, allowing researchers to develop a wide range of research skills. This subsequently leads to a continuous improvement in the quality of educational technologies. The author also points out that some products of educational technologies cannot always be divided into mixed, qualitative, or quantitative ones. In such cases, it is necessary to evaluate these products of educational technologies by specialists in the field, and by studying the impact on the level of knowledge of students.

The criteria for choosing a training technology for the effectiveness of its application in the educational process are represented as follows: the teacher's knowledge of a particular technology, the ability to apply it in the educational process; the willingness of students to the perception of learning in a particular technology (such as age, level of proficiency and readiness for training on a particular technology); technical support of the educational process (presence or absence of a computer, interactive whiteboard, etc.); previous experience of studying with the use of a specific technology. According to the author (Ponomariova, 2016), the disadvantages of innovative and

interactive methods are that case developers must be highly qualified, and fully proficient in the methodology and subject. But such qualities should be possessed by all teachers, so the listed disadvantages are a disadvantage of teachers, but not of technology.

The coach's role in determining the success of an educational program is very important, as is the coach's ability to impress students. For the success of the training, the coach must engage the students, and this applies to all ages of students (Chopra, 2017). The above factors influence the choice of a particular technology in the learning process. Also, the effectiveness of the above technologies is possible under certain conditions, namely: the skills and art of the teacher when teaching with the chosen technology and his or her level of mastery of technical interactive supplements, applications, and innovations. We also believe it is effective to use technology based on teachers' knowledge and skills. For example, older teachers find it more difficult to perceive computer technology and innovative additions in the form of presentations, interactive whiteboards, computer programs, and applications. However, their verbal abilities, their ability to teach in passive ways, and their ability to conduct traditional seminars are effective in achieving the goal of gaining knowledge. Accordingly, such teachers need to teach in their style and say, that the interactivity of their lessons can be achieved by videotaping lectures, online lectures for people with disabilities, etc. Young teachers need to master new technologies and educational tools, interactive whiteboards, applications, and so on, which still does not exclude the possibility of influencing the results of learning without that (using their characteristics of teaching).

4. Discussion

A necessary condition for successful education is not only the assimilation of knowledge but also the development of communication skills with people, the so-called “soft skills”. Summing up the research results, we can conclude that the use of gaming technologies is very effective at any age, and the content and conditions of the game are important (Slanbekova et. al., 2017). Moreover, it is difficult to measure the effectiveness of a particular technology, existing technologies are evaluated by testing students and comparing the results with students who do not use such technologies. We believe that this approach is acceptable, but it does not allow us to compare the effectiveness in a qualitative and quantitative dimension. Moreover, in pedagogy, it is necessary to constantly change the methods, because they complement each other, while the monotony of using technologies or techniques does not have an emotional factor and an element of novelty, which significantly affects the interest of children and adults in learning. Also, in the process of researching the data on the effectiveness of the use of educational technology (with students of all ages exploring completely different content and meaning of the objects), it is impossible not to notice the conditions that contributed to the success of the application of these technologies (Tondeur et.al., 2019). These conditions are as follows: well-trained teachers to work on the chosen technology, proper planning and distribution of the content of lessons, and the frequency and duration of the use of lessons on the chosen technology.

In addition to evaluating the effectiveness of technology as such, content planning, and long-term results, you cannot miss the importance of the environment in which the technology will be effective. Another important condition not only for the use of technology for education but the result of education in general is the correct alternation of active, passive, and interactive technology (Usoltseva, 2019). For this, it is important to plan the educational process in such a way that these technologies alternate. For example, one mathematics teacher is an excellent lecturer, i.e., a passive teacher, but a poor teacher of interactive technologies, which can be used in the classroom without,

or with the use of, computer technology. Another teacher, on the contrary, will be better able to conduct classes with the use of computer technology, with interactive communication between students, or conducting classes with the use of game technology. In our opinion, alternating lectures and interactive classes will have an obvious positive result. Also, older teachers who have difficulties in mastering a variety of technologies, but are perfectly able to teach lectures and seminars/ quizzes in the usual form (question and answer) should only improve their skills, while younger teachers need to master new technologies and educational tools. Only in this way will the educational process as a whole be effective, and not only through one-time or ad hoc introduction of technology into the learning processes. If the article we described in general content for students, as well as analyzed the research on the effectiveness of using technologies in the educational process of children and adults of different ages and the possibility of using such studies for people with disabilities.

So, it's possible to find an individual program for each student, whether he or she has disabilities or not. Remote tools are also can work better, of course, it has lack face-to-face cooperation between students, but it is still effective, especially during the pandemic. We can watch at Japanese studying process. They use laptops in regular classes, which can be more interesting for children because they like technology. As well, the ability to choose subjects will improve the effectiveness of processing the new information. There is a simple explanation for that. Every single child has special skills and abilities which can be improved, for example, one will be a good web designer another can be a musician, third one is interested in math or technologies, and so on. If we look at the example of Japan again, we can observe that they like to hire students to work then teach them and improve his or her skills during the working period which is approximately 20 to 25 years.

People with physical disabilities can be great computer users and developers and even can work in cybersecurity because they are highly motivated to work by using their brains. As well, there can be brain disorders. Let's view Dyslexia. Students with this disorder can hardly read new information and hardly compare with healthy classmates, but if we take a look at the biography of British billionaire Richard Branson, we can see that he had Dyslexia and was almost kicked out of the regular school. So, he needed to remember information instead of reading it. And finally, he graduated from the school and became who he is now. Sometimes one single disorder can improve another part of the brain. Blind people have perfect hearing and so on. If we know how to use it for society, new professions can be invented for such people. But of course, it takes training and a personal studying program.

Sometimes students have hard family conditions, for example divorce of parents. They should have the support of a school psychologist and have instructions on how to study in this situation and handle negative emotions. Talking about teachers, we would like to say that they should love their subjects and when students see their expression and passion during the process of studying, it is easier to handle the studying process and have respect from young learners. As well, it will be great to allow teachers to edit the program for classes. As well, motivation can play a huge role. Updating the system of education can motivate teachers more, it can be a higher salary, visits to museums and conferences, or even a new apartment after a few years of working. So more young men and women will choose this profession.

5. Conclusion

Through the analysis of empirical research data, this study examines the effectiveness of educational technology and identifies different types and forms of instructional approaches associated with specific technologies. These approaches are categorized into various forms, including classroom-

based without computer technology, classroom-based with computer technology, remote learning with teacher guidance, or self-paced learning through computer programs. Additionally, they are classified as passive, where knowledge is provided through predetermined instructional programs, or active, where students engage in tasks, information seeking, and creation of presentations or textual materials. The study emphasizes that selecting educational technology requires considering several criteria to ensure its effectiveness in the educational process. These criteria include the readiness of teachers/instructors to teach with a specific technology, the availability or absence of technical support, and the preparedness of students to engage in different instructional forms.

The study suggests that a combination of active and passive methods in the overall educational process leads to effectiveness. To achieve this, the study proposes planning the educational process by alternating between passive instructional methods and interactive, game-based, and innovative technologies. The findings also support the idea of grouping teachers based on their attitudes, competence, and willingness to integrate computer technology into education. In agreement with previous research, this study acknowledges the importance of teachers' attitudes, knowledge, and ability to leverage information computer technology in the educational process. The results highlight the significance of considering teachers' readiness and capacity to effectively incorporate technology into their instructional practices. The research provides insights into the effectiveness of educational technology, outlines various instructional forms associated with different technologies, and stresses the importance of combining active and passive methods. It supports the need for teacher readiness and competence in utilizing computer technology while advocating for strategic integration of technology in the educational process.

Further attention should be given to ensuring that educational technologies are accessible and inclusive for all learners, including those with disabilities or diverse learning needs. Research should explore strategies and tools to accommodate different learning styles, language proficiency levels, and assistive technologies to promote equal access and participation.

Conflict of Interest

The authors declare there is no conflict of interest in the presented research.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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