



EFFECTIVENESS OF USING ART TECHNOLOGY IN PRESCHOOL EDUCATION

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Abstract

The article explores the effectiveness of integrating art technology into preschool education. It examines how incorporating digital tools and creative activities enhances various aspects of young children's development. Cognitive development is fostered through activities like drawing and painting using digital devices, which stimulate imagination and problem-solving skills. Emotional development is nurtured as children express and regulate their feelings through art, while social development flourishes through collaborative projects, promoting cooperation and empathy. Additionally, art technology aids in physical development by improving fine motor skills and hand-eye coordination. Overall, the abstract highlights the benefits of utilizing art technology in preschool education for holistic child development.

Key words: STEM technology, cognitive activity, learning modules, logical thinking, electronics, mechanics, cybernetics, telematics, computer science, radio engineering, STEAM education program, art technology.

INTRODUCTION

In education has been developed in America. American researchers experimented and decided to integrate subjects like science, technology, engineering, and mathematics (STEM) to pay attention to the abilities of graduates. Later, the abbreviation Art was added, and it was shaped into STEAM. Researchers believe that these topics will help students become highly skilled professionals in the future, so the STEM system was designed to combine these subjects. In STEAM laboratories, children are encouraged to gain good knowledge, and they have the opportunity to apply it immediately. New job types and even new professional fields emerge every

day, so in the modern world, teachers face the question of whether they and their skills and abilities can meet the time demands. If we say that the main purpose of traditional education is to teach sciences and to use these sciences for thinking and creating, the STEAM approach teaches us to combine the knowledge we have gained with real experiences. This collaboration not only gives students some goals but also gives them the opportunity to apply and implement them. The most famous example of STEAM education is the Massachusetts Institute of Technology (MIT). The university created STEAM courses and even established STEAM education centers in some educational institutions to introduce the concept of STEAM to children in advance and familiarize them with it. According to statistics, since 2011, the demand for STEAM professions has increased by 17%, while the demand for ordinary professions has only increased by 9.8%, which indicates a high demand for this educational system worldwide. In the near future, there will be a very high demand for engineers and high-tech production specialists in the world and in Uzbekistan. In the long term, we will have specialists in technology, natural sciences, and engineering together, especially there will be a great demand for bio and nanotechnology specialists. Professionals need broad-based education and experience from various fields of technology, natural sciences, and engineering.

METHODOLOGY

STEAM technology is considered the most modern and promising trend in education today. It is widely used in most Western countries. This program:

- Influences the intellectual development of children in primary school age.
- Combines game activities with educating, nurturing, and developing children.
- Shapes cognitive activity, assists in socializing individuals, and enhances communication and collaborative skills.
- Integrates game with research and experimental activities.
- Teaches children to calculate, measure, and compare in a playful way.
- Helps acquire necessary mathematical and engineering skills.

The "STEAM Education for Primary School Children" program comprises a series of modules aimed at enhancing children's intellectual abilities:

- "F. Froebel's Didactic System" learning module.

This module includes materials in the form of soft ground modules that connect the child from the classroom table area to the playground area. The child's goals gradually develop adaptability and mobility, and it fosters their ability to work with visual images: imagining objects in various phase positions and mentally changing their relative positions.

- "Experimenting with Living and Non-Living Nature" learning module.

This module provides the opportunity to introduce children to water, air, non-living and living nature objects, and optical phenomena.

The proposed experiments help children learn about various characteristics of the surrounding world.

- "LEGO Construction" learning module.

Designing is not only practical creative activity but also a universal cognitive ability that manifests itself in other activities aimed at assembling and modeling various objects (visual, game, verbal).

- "Mathematics Development" learning module.

The content of the module is complex. It develops precision in mathematics, logical thinking, and the ability to apply algorithms. The main task of the module is to familiarize children with addition and subtraction, sorting and matching objects, and organizing and sorting them according to specific criteria (by color, shape, and size, from largest to smallest, etc.). Various supporting materials such as sets of geometric shapes, volume geometric figures, logical blocks and puzzles, sorting activities, aids for sensory development, mathematical constructors, and others are used for these purposes.

- "Robotics" learning module.

Robotics covers various disciplines such as electronics, mechanics, cybernetics, telematics, computer science, radio engineering, and electronics. Robotics in the children's room is a rare tool to develop attention, accuracy, and intelligence. It helps to develop entrepreneurship through scientific and technical innovation. It provides an opportunity to increase motivation and discipline.

- "I Create My World" Multi-Studio Learning Module.



A significant part of STEM education is introducing children to digital technologies. The "I Create My World" multi-studio module helps with this. It enables children to synthesize the results of their work on various projects through the creation of their own animated film.

STEAM is an innovative technology that allows for project and educational-research activities both in and outside of school. This method teaches subjects not in isolation but in an integrated manner, demonstrating their commonality. This approach presents students with a number of tasks, teaching them creativity in their solutions. Through such tasks, students not only learn to think but also learn to implement them in their daily lives. In this way, the student learns to solve tasks within the framework of the tasks assigned to them and the opportunities available. STEAM helps children develop the following important characteristics and skills:

- Understanding wide-ranging issues.
- Creative thinking
- Engineering guidance
- Critical thinking

STEAM is now considered the fundamental tradition of the world education system's innovative education technology. It poses difficult tasks for modern education: preparing a child for life in future society, which first and foremost requires special intellectual abilities to work with rapidly changing information. Acquiring, processing, and applying information abilities are the basis of the STEAM education program. Based on its practical experience, it provides a method based on the project approach to learning and later applying acquired knowledge in children's activities: discovering and understanding the relationships between events in the surrounding world, identifying and understanding new, unusual, and very interesting things. Waiting to get to know new things develops curiosity and cognitive activity; discovering interesting tasks for oneself, choosing methods, and creating algorithms to solve them, the ability to critically evaluate the results - the engineering thinking style, and develops collaborative activity skills. All of this ensures the child's holistic development and creates even more opportunities for future career choices.



The main difference of STEAM education technology from other technologies is that it ensures the integration of intellectual and practical activities with cognitive activities to successfully master various subjects. Utilizing STEAM education technology is highly beneficial for developing the intellectual abilities of children aged 3-7 years. Most researchers prove that the preschool age is the most favorable period for intellectual development. The period of a child's life in preschool age is considered as a process of rapid development of personal intellectual abilities. By the age of three, a child begins to develop sensory activity, curious attention, and verbal speech, forming communicative skills. The child starts to learn the world with personal curiosity, modeling ideas about the simplest phenomena of nature and social life. Game activity and verbal communication play a fundamental role in the process of learning and understanding, as well as reasoning. Complex types of analytical and synthetic activities develop in the child. In sensory organs - sight, hearing, smell, taste, and touch perception processes, through understanding, the surrounding world appears diverse and filled with various sounds. The development of a child's understanding occurs in several stages: at 3-4 years, understanding becomes objective, i.e., the child cannot separate the characteristics of an object from the object itself. By the age of 4-5, they begin to form initial ideas about shapes, colors, positions, and time. They develop a concept of size and begin to form an idea of comparing objects. At the age of 5-7, the child's knowledge about objects and their characteristics expands, and understanding becomes more rapid, meaningful, and purposeful. The child begins to acquire their personal experience and, along with it, social experience. Understanding opens the way to the development of thinking through observation, oral speech, attention, memory, and imagination. In preschool age, game activity is the most effective way to develop a child's imagination. During this period, the child's ability to create new ideas and plan their realization develops, which indicates the growth of imagination. Thus, in each stage of preschool age, the development of a child's intellectual abilities is characterized by a set of features. During preschool age, the most effective activities for developing a child's intellectual abilities are game, cognitive research, design, animation, and creative activities based on their production activities. The main methods of developing intellectual abilities

are targeted at developing perception, memory, imagination, and thinking. The formation of cognitive processes, depending on the degree of development, leads to independent creative knowledge, the conduct of small intellectual and practical research, generalization, analysis of one's own activities and results, creating similarities, and drawing conclusions. Children carry out these processes through game activities. Teachers mainly use various methods to guide children in their game, actively supporting and encouraging active and leading children to support their peers, attracting, captivating, and working together. Children improve their relationships with their peers, express their attitude towards their peers' actions, and protect their own opinions and decisions. As a director, the teacher guides children in advance about the topic of the game, distributes roles. When using STEAM education technology in game activities, conditions are provided to develop a child's intellectual abilities in accordance with their age and individual characteristics.

RESULTS

In achieving the set goals, specific games, construction, learning, and research activities, scientific and technical creativity, and artistic and creative activities such as design, creating cartoons are implemented. The above-mentioned activities are considered as the basis for developing modern technologies of the 21st century and help children develop programming, master digital technologies. The main modules of STEAM education technology are implemented in practice in the following areas: - game-construction-cognitive and research activity; - types of artistic and creative activities, as well as elements of programming and mastering digital technologies. Each module is designed to solve complex tasks in a complex way, aimed at developing children's intellectual abilities and teaching scientific and technical creativity through cognitive research processes. The development of artistic-technical creativity in children of preschool age, in general, involves the development of ICT and digital technologies, the formation of media literacy through effective independent activities, the development of children's logical and algorithmic thinking, planning and modeling skills.

Education and upbringing have always been one of the most crucial tasks at all times, as they directly contribute to the socio-economic development of the country



by preparing highly skilled and qualified professionals through the direct education system. Nowadays, the widespread use of pedagogical innovations in the education process is considered a global trend in the development of education. Due to the rapid modernization process in the country, the increase in the scale of the education sector, the introduction of new content, forms, methods, and tools into the education process are being given special attention. However, the current level of implementation of pedagogical innovations in terms of introducing new content, forms, methods, and tools in the education process is not considered sufficient yet. In fact, each teacher needs to continuously study new innovations related to their field and the development of the younger generation's education and upbringing in order to effectively apply them in their work. Today, there is a demand to quickly incorporate innovations in the content of educational programs in order to prepare the ground for the formation of modern knowledge. In addition to this, modern teaching technologies and related teaching methods create favorable conditions for teachers to more easily and deeply shape important knowledge, laws, and many fundamental concepts in students. The main goal of STEAM education is practical theoretical knowledge. That is, during the learning process, we need to not only use our brains but also our hands. Obtaining knowledge during the lesson may not always be compatible with the rapidly changing world. The main difference between STEAM education and traditional education is the equal use of the intellectual and practical abilities of children to successfully learn various subjects.

Creativity plays a crucial role in the education and upbringing of individuals, transforming a person from merely a performer into an independent thinker capable of generating new ideas, making bold decisions, and being ready to adopt unconventional solutions. The issue of creativity in education is particularly significant and pressing in our regional context.

It is known that every profession requires a creative approach. Therefore, it is essential to instill in the younger generation, regardless of the profession they choose, the ability to see a new world, even if it's just a small success. Thus, in every stage of education, it is one of the most critical tasks for educators to focus deeply on aesthetic

education and nurture creativity in students. Indeed, where there is creative initiative, there is always movement and time-saving, leading to increased efficiency.

Many studies have been conducted on solving pedagogical problems related to the development of an individual's creative abilities. The principles of developing creativity in children and adolescents have been extensively studied both theoretically and practically by A.V. Lunacharskiy, P.P. Blonskiy, S.T. Shatskiy, B.L. Yavorskiy, B.V. Asafiev, N.Yu. Bryusova, V.N. Shatskaya, N.L. Grodzenskaya, M.A. Rumer, G.L. Roshal, and N.I. Sats. As human thought continues to evolve, so does the scope of research on creative thinking.

Initial diagnostic tasks have been developed in research to reveal the level of creative thinking development. The creative processes of children and adolescents began to be experimentally studied, and practical programs were developed to foster creative abilities.

Evaluating the role of imagination in the creative process is somewhat complex. Creativity, like all mental processes, is closely linked to imagination. For each person to fully utilize their creative process, they must develop and manage their creative thinking skills. Creative thinking involves learning something new. Performing tasks creatively, improving something, or carrying out activities aimed at achieving specific results indicate the presence of creative ability. Creative potential encompasses the learner's qualities, abilities, skills, and characteristics that lead to the formation of a creative personality and the revelation of each child's potential. Therefore, ART-pedagogy, which studies the laws of education and human development through art, is of significant importance in the modern education system.

Art pedagogy is one of the scientific directions that studies the essence, forms, principles, and mechanisms of the influence of art and creative activity on the formation of an individual in the content of education. This field is practice-oriented and fully reflects the tendency to generalize knowledge characteristic of modern humanities. In sources, art pedagogy is described as a science of teaching, educating, and developing through art. The concept of "art pedagogy" originated from the word "art" in Latin (ars), English and French (art), and Italian (arte), meaning "art." In the UK, "art" refers to visual arts such as fine arts, sculpture, graphics, and others, while

in many other countries, it also includes music, drama, dance, and literature. Art pedagogy, as one of the modern pedagogical technologies, is characterized by a return to personality, a change in the attitude towards the branches of artistic art, the understanding of art as an important tool in modern education, and its wide implementation into the education system.

Art plays an important role in self-awareness and creative development in an individual's education. Art pedagogy is the integration of art, pedagogy, and psychology for the education, upbringing, development, and support of the growing individual.

The introduction of art pedagogy into the educational process is one of the ways to create such an environment. At the same time, art becomes a mediator that provides psychological conditions for the perception, understanding, and reinforcement of pedagogical content. Its goal is not to teach children the basics of painting or musical literacy, but to develop their abilities for self-expression, self-awareness, and communication skills. Art pedagogy helps children develop imagination, attention, creative thinking, the ability to freely express their emotions and moods, and teamwork skills. According to N.Yu. Sergeeva, who thoroughly studied this direction of pedagogy, "in general, the content of art pedagogy can be defined as the formation of a personality through art and creative activity in the educational space." [3.,165.]

The content of art pedagogy is to help develop artistic culture in a person and successfully master various types of artistic activities in the educational and upbringing process.

Thus, the perfection of artistic and creative education serves to maintain the stability of a child's personal development.

Today, the opportunities to receive general art education and integrate art pedagogy more widely into continuous education practices are greater than ever. In the era of modern digitalization, more artistic resources are available to educators: collections of world visual art, written monuments in all languages, great examples and artistic works of world cinema, and various musical works by the world's leading composers.

Indeed, a modern educator does not need to have encyclopedic memory, as today everyone has the opportunity to access the entire artistic heritage of the world at any time thanks to the Internet.

Internet networks in educational institutions have become a convenient multimedia tool for acquiring knowledge, allowing information to be delivered to children in a visual form.

The involvement of art works in the educational process and the integration of art forms into preschool education contribute to the formation and development of children's artistic and creative abilities, enriching their emotional and cognitive experience (L.S.Vygotsky, A.N.Leontiev, V.S.Mukhina, S.L.Rubinshtein, and others). Art pedagogy opens up potential opportunities for children's development and self-awareness, as it ensures the harmony of education, upbringing, support, and development opportunities for the growing individual.

The need to scientifically address the issue of developing visual activities in preschool-aged children through art pedagogy is influenced by the following problems:

Society's need for a humanistically developing individual;

The necessity to pay attention to ethical and aesthetic values;

The shortage of specialists in visual activities in preschool educational institutions;

The lack of developed programs and technologies;

The absence of necessary conditions for the systematic development of visual activities in preschool education;

The limited opportunities for using universal means of art in preschool education practice. It is crucial to prioritize the development of methods and techniques of art pedagogy for each stage of education, designing technologies, and defining tasks aimed at the harmonious development of the individual through art and artistic-creative activity.

The ways to develop visual activity skills in preschool-aged children include: developing the artistic perception and understanding of art works (according to the children's age characteristics), enriching their emotional and cognitive experience in

assimilating and applying reality. The technologies for incorporating art into the pedagogical process were developed considering the teacher's main role and the principles of art pedagogy. A study was conducted to theoretically substantiate, practically develop, and experimentally test the effectiveness of using art pedagogy for developing visual activity skills in 5-7-year-old preschoolers. The object of the study was the process of visual activity, focusing on developing visual activities through art pedagogical technologies.

CONCLUSIONS

The analysis of visual activity programs in the preschool and additional education system indicates the need to develop an additional development program in the artistic-creative direction: "image. creativity. learner."

Through practical testing of the additional education program, the following tasks were solved:

Developing the perception and understanding of art works;

Developing the child's individual and creative abilities;

Stimulating the development of emotions (thinking, memory, attention, will) through art;

Developing dialogic communication skills in the process of visual activity.

The practical application of art pedagogy necessitates the development of art technology in education. the concept of "art technology" is described in various ways: art technology encompasses methods, techniques, forms, and means of various art forms used in the educational process to reveal and develop a child's creative potential and understand the significance of studied scientific facts, objects, and phenomena. It includes areas such as visual art technologies (drawing, modeling, collage, sand art technology, landscape art technology); music art technology; drama technique; storytelling art technology (fairy tale art technology). A.I. Kirillova describes art technologies as visual means: photographs, pictures, cartoons, schemes, collages, slides; fairy tales; songs; rhymes and poems; games; cinema; computer; theatrical performances; dance; drawing. It should be noted that today, art technologies are being proposed not only for children but also for adults, both for rehabilitation and

recreational pedagogy to restore their energy. "Aesthetic fullness" as a key characteristic of the rehabilitation and recreational environment aims to achieve the integration of art methods into educational activities, creating an educational environment focused on developing the sense of beauty and artistic creativity. [2.,197.]

According to this, art technology is described as the "system of artistic creation methods" by scientists (A.K. Mynbaeva, A. Smailova); "a collection of art tools and methods of artistic and creative activity" (S.V. Starikova); "personal development methods" (I.E. Shkil); "set of psychocorrection methods" (O.V. Burachevskaya); "visual tools" (A.I. Kirillova). It seems that the associative field of art-technologies consists of the following key word chain: "personal development" - "corrective methods" - "methods of artistic art" - "art and visual tools".

Therefore, art and technology can be used for personality development or maintaining a harmonious state of the human psyche - psychological health. In addition, this technology helps a person to master the methods of self-soothing, expression, awareness and professional activity. In fact, as L. Lebedeva noted, art technology "uses elementary artistic tools and does not require painting experience, which confirms that it is useful for every person who aims for self-realization and creative development. [1,256.] The subjects of the art-technological process - the participant and the art therapist (i.e., the transferor of the technology) communicates with each other verbally, symbolically, associatively and through non-verbal, visual communication through creative products. In the process of art technologies, a person first plays the role of an artist, then becomes an observer, and over time begins to feel the sense of integrity and harmony of the image of "I".

In art-pedagogical technology, the task of teaching painting is not a priority. Solving the problems of emotional and cognitive development of a person, the development of his intuition and emotional sphere (sensing processes, emotions), the development of the ability to express his feelings and thoughts (self-awareness) is very important. R. Sidikova also sees the essence of art technologies in "creative application of various art styles in the educational process, self-awareness and personal development strategy of the future specialist" [4.,47.]



So, art-technology is one of the promising directions of modern education and is based on a certain type of art. The use of art technologies in the educational process includes:

- 1) reveal children's creative abilities and personal potential;
- 2) enrichment and activation of children's vocabulary;
- 3) formation of reflective skills of children;
- 4) enables the formation of competence to solve problems that may arise in life.

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