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Study of Foreign Experience in The Application of Steam Technologies in Preschool Education

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Abstract
The article begins with a brief overview of the theoretical foundations of STEAM education, to be followed It then provides a critical overview of different curricula, pedagogies, and technologies used in preschool education around the world. The article also examines the experience of STEAM technologies in preschool education in foreign countries and Uzbekistan.

Keywords: STEAM education, preschool education, curricula, pedagogy, technology, foreign experience, the difference between foreign countries and Uzbekistan.

Introduction

In recent years, there has been increased interest in integrating STEAM education into early childhood education (EC). The integration of STEAM subjects in DL is based on the belief that young children are naturally curious learners and have the potential to develop strong foundational skills in science, technology, engineering, art and mathematics that will benefit them in the future. However, the use of STEAM technologies in DL is not a standard practice in many countries of the world and requires additional research and analysis of foreign experience.

The purpose of this article is to analyze foreign experience in the application of STEAM technologies in DL and to identify the most effective strategies, pedagogies and training programs.

STEAM education is an approach to learning that integrates science, technology, engineering, art and mathematics. It promotes the development of creative and critical thinking skills, problem-solving skills and teamwork. The STEAM approach also helps children develop important social skills such as communication, leadership and collaboration. Benefits of STEAM Learning for Young Children

Many studies show that STEAM education in distance learning can significantly improve learning outcomes and increase the level of participation of children in the educational process. It also promotes the development of creative and critical thinking skills that can be useful in children's future academic and professional lives. STEAM education also helps children develop important social skills such as communication, leadership and collaboration [1].

Different countries of the world have different curricula, pedagogies and technologies used to integrate STEAM into DL. For example, in the US, the Kindergarten-to-School STEM Starters

program offers children the opportunity to engage in science experiments, programming, and building robots. In the UK, the Early Years STEM program aims to create a special environment where children can explore and experiment with materials and develop their skills in science, technology, engineering, art and mathematics.

In Japan, the concept of "Educational Robotics" involves the use of robots to develop problem-solving, programming, and engineering skills in young children. In Israel, the "STEM in Kindergarten" program uses AR/VR technologies to create interactive and entertaining lessons in science, technology, engineering, art and mathematics [2].

Some countries, such as Finland, have an innovative learning approach called "Phenomenon-based learning" that allows children to learn science, technology, engineering, art, and math through real projects and tasks.

In recent years, there has been a growing interest in the world in the use of STEAM technologies (Science, Technology, Engineering, Arts, Mathematics) in education, including preschool education. These technologies combine knowledge from different areas and allow children to develop not only the ability to solve problems, but also creative thinking [5].

The use of STEAM technologies in preschool education has many advantages. First, they help children develop the skills and abilities they need for their future careers in science, technology, engineering, mathematics, and the arts. Secondly, the use of STEAM technologies can improve the learning process and make it more interesting and entertaining for children.

Many foreign countries have already introduced STEAM technologies in preschool education and have achieved significant results. For example, in the US, the Code.org project provides free programming lessons for children aged 4 to 9 using games and interactive activities. In Japan, children are offered to engage in "visual programming" with the help of special constructors [3].

In Finland, the Luotsi project is using STEAM technology to improve learning and create new ways of working with young children. This project conducts innovative trainings for teachers and educators who use STEAM technologies in preschool education.

One example of the successful use of STEAM technologies in preschool education is the "RoboMind" project in the Netherlands. This project uses a program to teach children how to program robots. Children play interactive games during which they learn how to program the movements of robots and solve problems. In addition, children learn to work in a team and develop their social interaction skills.

In Australia, the MakerKids project offers children the opportunity to create their own projects using 3D printing, electronics, robotics and other STEAM technologies. Children learn to solve problems, create innovative products and develop their creativity [4].

In addition, the use of STEAM technologies in preschool education helps children develop social adaptation and communication skills. Children learn to work in a team, communicate and share ideas, which helps them become more self-confident and improve their social interaction skills.

One of the key elements of the successful implementation of STEAM technologies in preschool education is the training of qualified teachers and educators. They must have sufficient knowledge and experience in the field of STEAM technologies in order to effectively educate children [6].

It should also be taken into account that the use of STEAM technologies in preschool education should be based on an individual approach to each child, taking into account his interests and needs. It is important not only to give children access to technology, but also to help them understand how to use these technologies to solve different problems.

Examples of foreign experience show that the use of STEAM technologies in preschool education gives excellent results. In Japan, for example, preschools have robotic classes where children can create, program, and control their own robots. Also in Japan, children learn architecture and construction using Lego blocks and other constructors [8].

In the US, preschoolers have access to 3D printing equipment, electronics and other STEAM technologies. They create their own toys, design and prototype their inventions. Also in the United States are gaming platforms and applications that help children learn science, technology, engineering, art and math.

In Sweden, children in preschool institutions learn programming, creating multimedia projects, working with electronics and robotics. The use of STEAM technologies helps children develop their skills and abilities in the field of technology, creative thinking and social adaptation [4].

If we talk about the main differences between STEAM technology in preschool education (PE) in foreign countries and Uzbekistan. One difference is how they are implemented in the educational process and what teaching methods are used.

In foreign countries, including the USA, Europe and Asia, STEAM technologies have long been used in DL. These countries have developed specialized programs and teaching methods that help develop children's interest in science, technology, engineering, mathematics and the arts. In preschools in foreign countries, children already at the early stages of their development get acquainted with various aspects of STEAM technologies using games, projects, experiments and other interactive learning methods. They learn to solve problems, develop creative and critical thinking, and improve communication skills [9].

In Uzbekistan, STEAM technologies in DOs are just beginning to be introduced. At the moment, they are used mainly at the level of higher education and research. Although there is some effort to integrate STEAM technologies into DOs, this is happening to a very limited extent. In Uzbekistan, STEAM technologies in distance learning are most often used in the form of additional classes, and not as part of the main educational program. In addition, the teaching methods used in DOs in Uzbekistan are often based on traditional approaches, which may be less effective in developing children's interest in STEAM technologies [7].

Thus, the main difference between STEAM technologies in distance education in foreign countries and Uzbekistan is that in foreign countries they are widely used in the educational process, starting from an early age, using interactive teaching methods, and in Uzbekistan they are just beginning to be introduced and are used to a limited extent. in the form of extra classes.

It is important to note that steps have been taken in Uzbekistan in recent years to promote the introduction of STEAM technologies in DL. For example, in 2020, the Ministry of Education of Uzbekistan signed an agreement with UNESCO on the development of STEAM education. This can become an impetus for the wider introduction of STEAM technologies in the DOs of Uzbekistan and the development of new teaching methods that meet modern requirements.

It is also worth noting that cultural and historical differences between foreign countries and Uzbekistan may affect how STEAM technologies are introduced into the educational process.

In Uzbekistan, it may be necessary to develop specialized programs and teaching methods that take into account the peculiarities of the culture and traditions of this country. For example, you can use elements of Uzbek culture and history when creating projects and activities to attract the attention of children and increase their interest in STEAM technologies.

In general, despite the differences between STEAM technologies in DL in foreign countries and Uzbekistan, it is important to recognize their importance for the development of children in the modern world. A rapidly changing technological environment requires children to be able to adapt and solve new problems, and STEAM technologies help develop these skills. It is important to continue research and development of new methods for introducing STEAM technologies in DL in order to provide a better education for the future generation.

Based on the analysis of foreign experience, several basic principles of effective STEAM training in DO can be distinguished:

1. The integration of science, technology, engineering, art and mathematics should be organized into a coherent whole so that children can see the connection between different fields of knowledge.
2. STEAM learning should be fun and interesting so that children are motivated to learn and explore.
3. It is important to create a suitable STEAM learning environment that includes modern technologies, materials and tools.
4. Children should be able to work in groups and communicate with each other to develop social skills.
5. The pedagogical approach must be individual and differentiated, taking into account the needs of each child [6].

Thus, the use of STEAM technologies in preschool education has great potential for developing the skills and abilities of children necessary for their future career and social life. Foreign experience shows that the use of STEAM technologies in preschool education can give a significant result in the development of children and improve the learning process. However, it is necessary to take into account the characteristics of each child and ensure the training of qualified teachers and educators for the effective implementation of STEAM technologies in preschool education.

In addition, the use of STEAM technologies in preschool education can help children develop values related to environmental issues and sustainable development. For example, children can learn the principles of renewable energy and build prototypes of solar or wind powered devices.

The use of STEAM technologies can also help in solving the problems of social inequality in education. One concern is that some children may have limited access to the high-tech hardware and software that is used to use STEAM technologies. However, incorporating these technologies into early childhood education can help bridge this gap by enabling every child to have access to the latest technologies and knowledge.

In conclusion, the use of STEAM technologies in preschool education can help children develop not only technical skills, but also creative, social and cognitive skills. For example, when creating projects as part of STEAM learning, children learn to work in a team, develop their ability to make decisions and solve problems, improve their communication and leadership skills.

In general, foreign experience shows that the use of STEAM technologies in preschool education has great potential for improving the quality of education and developing children's skills and abilities. But the introduction of these technologies should be carried out taking into account the characteristics of each child and with the support of qualified teachers and educators who can organize effective learning within the framework of the STEAM approach.

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