THE INTRODUCTION OF STEAM TECHNOLOGIES IN PRESCHOOL EDUCATION

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INTRODUCTION: The integration of science, technology, engineering, art, and math (STEAM) in preschool education is becoming increasingly popular in many countries around the world.

PURPOSE: provide a comprehensive overview of foreign experience in the use of STEAM technologies in preschool education.

MATERIALS AND METHODS: 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.

DISCUSSION AND RESULTS: The results of the study emphasize the importance of introducing such programs in educational organizations to effectively develop children's complex skills necessary for successful adaptation in a rapidly changing world.

CONCLUSION: Integrated curricula within the STEAM approach integrate knowledge and techniques from various disciplines such as science, technology, engineering, art and mathematics to solve complex problems and challenges. Such programs provide holistic learning that allows children to understand the relationships between different areas of knowledge and apply them to real-life situations.

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

In recent years, there has been an increased interest in integrating STEAM education into pre-school education. The integration of STEAM subjects into DO is based on the belief that young children are naturally curious learners and have the potential to develop solid fundamental skills in science, technology, engineering, art, and mathematics that will be useful to them in the future. However, the use of STEAM technologies in DO is not a standard practice in many countries of the world and requires additional research and analysis of foreign experience [2].

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 and teamwork skills. The STEAM approach also helps children develop important social skills such as communication, leadership, and collaboration. The benefits of learning on STEAM for young children Many studies show that STEAM education in preschool can significantly improve learning outcomes and increase the level of children's participation in the learning 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 training also helps children develop important social skills such as communication, leadership, and collaboration [1].

There is a growing interest in the use of STEAM technologies (Science, Technology, Engineering, Arts, Mathematics) in education, including preschool education. These technologies combine knowledge from different fields 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 necessary for their future careers in science, technology, engineering, mathematics, and the arts. Secondly, the use of STEAM technologies makes it possible to improve the learning process and make it more interesting and entertaining for children. 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 confident and improve their social interaction skills [7].

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 to effectively teach children [6]. It is also necessary to take 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 tasks. Examples of foreign experience show that the use of STEAM technologies in preschool education gives excellent results. In Japan, for example, preschool institutions offer classes using robots, where children can create, program, and control their own robots. Also in Japan, children study architecture and construction using Lego blocks and other construction materials [8].

STEAM technologies are just beginning to be introduced in Uzbekistan. At the moment, they are mainly used at the level of higher education and scientific research. Although there are some efforts to integrate STEAM technologies into the software, this is happening to a very limited extent. In Uzbekistan, STEAM technologies in pre-school education are most often used as additional classes, rather than as part of the main educational program. In addition, the teaching methods used in pre-school education in Uzbekistan are often based on traditional approaches that may be less effective in developing children's interest in STEAM technologies [6]. Thus, the main difference between STEAM technologies 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, while in Uzbekistan they are just beginning to be introduced and are used only to a limited extent in the form of additional classes. It is important to note that in Uzbekistan in recent years, steps have been taken to promote the introduction of STEAM technologies in the DO. For example, in 2020, the Ministry of Education of Uzbekistan signed an agreement with UNESCO on the development of STEAM education. This may become an impetus for the wider introduction of STEAM technologies in Uzbekistan and the development of new teaching methods that meet the requirements [5].

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 training programs and 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 assignments to attract the attention of children and increase their interest in STEAM technologies. In general, despite the differences between STEAM technologies in other countries and Uzbekistan, it is important to recognize their importance for the development of children in the modern world [9]. The rapidly changing technological environment requires children to adapt and solve new problems, and STEAM technology helps to develop such skills. It is important to continue research and development of new methods for implementing STEAM technologies in pre-school education in order to provide better education for the future generation. Based on the analysis of foreign experience, we can identify several basic principles of effective STEAM training in pre-: 1. The integration of science, technology, engineering, art and mathematics should be organized into a single whole so that children can see the connection between different fields of knowledge. 2. Learning on STEAM should be entertaining and entertaining 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 should be individual and differentiated, taking into account the needs of each child [10].

Thus, the use of STEAM technologies in preschool education has great potential for developing the skills and abilities of children necessary for their future careers and social life. International experience shows that the use of STEAM technologies in preschool education can yield significant results in the development of children and the improvement of 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 contribute to the formation of children's values related to environmental issues and sustainable development. For example, children can learn the principles of renewable energy sources and create prototypes of devices powered by solar or wind energy. The use of STEAM technologies can also help solve the problems of social inequality in education. One of the problems is that some children may have limited access to high-tech equipment and software that are used to apply STEAM technologies. However, the introduction of these technologies into preschool education can help reduce this difference by enabling every child to gain access to the latest technologies and knowledge [8].

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 education, children learn to work in a team, develop their ability to make decisions and solve problems, and improve their communication and leadership skills. The use of STEAM technologies in preschool education has a huge potential for improving the quality of education and developing children's skills. 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 will be able to organize effective training within the STEAM approach.

List of References.

1. Министерство образования Узбекистана. (2020). Узбекистан и ЮНЕСКО будут сотрудничать в области STEAM-образования. URL: https://mfa.uz/en/press/news/2020/10/23182/

2. Садикова, Д. Х. (2024). ЭКСПЕРИМЕНТЫ ДЛЯ ДЕТЕЙ ДОШКОЛЬНОГО ВОЗРАСТА С УЧЕТОМ ТЕХНОЛОГИЙ STEAM. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 55(2), 26-28.Деде К. (2017). Образование STEM и STEAM: введение. Политические аспекты поведенческих и мозговых наук, 4(2), 171-178.

3. Садикова, Д. Х. (2025). ЗАРУБЕЖНЫЙ ОПЫТ В ПРИМЕНЕНИИ STEAM ТЕХНОЛОГИЙ В ДОШКОЛЬНОМ ОБРАЗОВАНИИ. MAKTABGACHA VA MAKTAB TA'LIMI JURNALI, 3(1).

4. Sadikova, D. X. (2025). MAKTABGACHA TA'LIMDA STEAM TEXNOLOGIYALARNI QO 'LLASH. Inter education & global study, (1), 332-340.

5. Садикова, Д. Х., & Калауова, М. С. (2024, March). РАЗВИТИЕ ТВОРЧЕСТВА ИНЖЕНЕРНЫХ СПОСОБНОСТЕЙ STEAM У СОВРЕМЕННЫХ ДЕТЕЙ. In Proceedings of International Conference on Modern Science and Scientific Studies (Vol. 3, No. 3, pp. 180-184).

6. Furkatovna, K. D. (2025). Effectiveness Of Improving Technologies For The Development Of Social Competence Of Future Educators. Shokh Library.

7. Khalilova, D. F. (2025). Facilitator competence of the future preschool educators. Bulletin News in New Science Society International.

8. Furqatovna, X. D. (2024). The Role Of Social Competence In The Professional Activity Of Future Educators Of Preschool Educational Institutions. Web of Discoveries: Journal of Analysis and Inventions, 2(3), 59-61.

9. Furqatovna, X. D. (2024). MAKTABGACHATA'LIMTASHKILOTIDAOTA-ONALAR BILAN HAMKORLIKDA TARBIYACHINING ROLI. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 46(5), 79-83.

10. Furkatovna, X. D. (2023). Bo 'lajak tarbiyachilarni ijtimoiy kompetentligini rivojlantirish pedagogik muammo sifatida. Science and innovation, 2(Special Issue 4), 57-59.