APPLICATION OF STEAM IN INSTITUTIONS OF DEPTH EDUCATION

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Annotation. It is planned to improve and gradually introduce national education standards and curricula, including STEAM methods. This form of scientific and technical education complements STEM subjects with the creative component of "Art" - "art", which involves the development of students' creative and artistic thinking.

Keywords: Content analysis and thematic monitoring of existing publications for the keywords "STEAM technologies", "enhancement of cognition", "creation of educational laboratories". Results.

The rapid development of high technologies and their penetration into all aspects of social life poses a number of important tasks for the state, including the adaptation of economic and educational strategies to the trends of scientific and technological progress. The era of global innovative changes imposes additional requirements on representatives of familiar professions and leads to the emergence of new high-tech specialties in the global labor market.

In such conditions, investing in the so-called “intellectual capital” - young highly qualified, creatively thinking specialists who are able to solve complex production problems, quickly master new labor technologies, thereby ensuring continuous growth rates, becomes a priority task for our state. economy and its competitiveness.

The basis for training such personnel is the modernization of the traditional system of scientific and technical education and the use of innovative forms of

education. Experts consider STEM education to be one of the most promising approaches to the formation of human resources for knowledge-intensive sectors of the economy and industry.

The term STEM (Science, Technics, Engineering, Mathematics) was introduced by the US National Science Foundation in the early 2000s. This concept combines science, technology, engineering and mathematics and is also used to denote an innovative approach to science and technology education. It implies the study of technology, exact and natural sciences not as separate disciplines, but as a whole by setting tasks that require the complex application of knowledge in these areas. The main goal is not to "memorize" the sciences, but to develop students' logical, creative and imaginative thinking, teamwork skills, adaptability and innovative solutions, and increase their motivation to choose a scientific and technical profession.

Today, STEM education is already a traditional component of state education strategies in leading countries of the world. Australia, New Zealand, South Korea and a number of other countries regularly publish national reports with recommendations for reforms in the field of STEM education. Within the framework of policy documents, governments, together with scientific and educational institutions and specialized non-governmental non-profit organizations, develop and coordinate educational projects and programs aimed at providing STEM education to all categories of young people, stimulating interest in science and technology, as well as developing educational and methodological technologies. For example, in the USA there is a Committee for Coordination of Federal Programs and Activities in Support of STEM Education, which, together with the US Departments of Education and Energy, the National Science Foundation, develops, implements and takes action on policy in this area. , NASA, the National Oceanic and Atmospheric Administration, etc. Also, a five-year strategic plan for the development of STEM education in the country for 2013-2020 was adopted, which aims to train 100

thousand new effective STEM teachers, support existing teachers, and increase the share. By 2020, the number of students and graduates in STEM specialties has reached 1 million people.

In 2015, the Center for the Development of Corporate Social Responsibility signed a multilateral memorandum on the creation of a STEM education coalition, which brought together Kyivstar, Syngenta, United Minerals Group, Energoatom National Company, Samsung, Microsoft Ukraine, Kyiv National University of Culture. Arts and others (16 participants in total). The coalition prepares recommendations to the Ministry of Education and Science on the introduction of innovative methods and STEM subjects into school curricula, creates opportunities for teachers, schoolchildren and students to conduct research and experimental work on modern equipment. In addition, STEM education festivals are organized annually in a number of cities of the country. Since 2016, Interpipe TechFest has been held - a large technical and popular science festival with an exhibition of modern engineering and technologies, lectures on technical subjects and student competitions.

Active efforts of countries to modernize their educational standards and expand the potential of scientific and technical personnel make the issue of introducing STEM methods into our country's education system urgent. The necessary conditions for this are already being created in Uzbekistan. In particular, the Program of Measures for Further Improving the Public Education System of the Republic of Uzbekistan for 2018–2021 has been approved. The document outlines a new framework for general secondary education.

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As part of the implementation of relevant measures, in October of this year, during the visit of the delegation of the Ministry of Public Education of Uzbekistan to the United States, agreements were reached on the implementation of a number of projects and programs in our country. reform of the school education system, the involvement of foreign specialists in the introduction of modern teaching methodologies in Uzbekistan, including STEM education.

Against this background, one of the latest initiatives of the head of Uzbekistan to open presidential schools in each region of our country, specialized in in-depth teaching of STEAM subjects under the guidance of foreign specialists, according to MPE, looks very important.

Earlier, in accordance with the resolutions of the President of the Republic of Uzbekistan, two state specialized educational institutions were established in Tashkent, which provide in-depth training in ICT, exact sciences, as well as aerospace and astronomical sciences. These are the Al-Khwarizmi School under the Institute of Astronomy of the Academy of Sciences of the Republic of Uzbekistan and the Mirzo Ulugbek Boarding School. The establishment of Presidential Schools throughout the republic will allow expanding such innovative experiences and creating favorable opportunities and prospects for a wider coverage of young people with scientific and technical knowledge, increasing their intellectual potential.

It all started with the term STEM, which appeared in the USA. The difference between STEAM and STEM is only one letter A - Art (art), but the difference in approach is huge! Recently, it is STEAM education that has become a real trend in the USA and Europe, and many experts call it the education of the future.

The introduction of art (art) The need to combine science and art was also written about by thinkers such as the 11th-century Chinese mathematicians of the Enlightenment.

Almost all inventors and scientists were also musicians, artists, writers or poets: Galileo was a poet and literary critic, Einstein played the violin, Morse was a portrait

painter, etc. Thus, through the practice of creativity, the skills associated with the right hemisphere of the brain were stimulated and strengthened. STEAM is a new educational technology that combines several disciplines as a means of developing critical thinking, research competencies and teamwork skills.

STEAM is an extension of the popular acronym STEM, which also includes art. S - science or science. T - technology, that is, technology. E - engineering, which means engineering in English. M - mathematics, the queen of sciences - mathematics. The abbreviation A - art, which is a new component of art, can be understood as completely different areas - painting, architecture, sculpture, music and poetry. The inclusion of art expands the range of students participating in the project, so students with less knowledge of design and mathematics can help the group achieve the aesthetics of the project.

The STEAM curriculum is based on the idea of teaching students through an interdisciplinary and practical approach. Instead of studying each of the five subjects separately, STEAM combines them into a single curriculum. STEM education allows for the use of scientific methods, technical applications, mathematical modeling, engineering design. This leads to the formation of innovative thinking of the student, skills and competencies of the 21st century.

The modern school represents a huge field for observing and analyzing the educational life of the school. Various technologies are used to increase cognitive activity and increase its role in the world, independence in student activities, the creation of new forms and methods within it. STEAM technologies are actively used in the system of additions. However, their practical application in the main educational process has not been seriously studied. This is due to the difficulty of integrating innovative approaches. With the implementation of the school curriculum. Methodology. The learning model, which uses design methods, pedagogical experiment, observation, conversation, generalization, is divided into the acquired experience. Content analysis and thematic monitoring of existing

publications for the keywords "STEAM technologies", "enhancement of cognition", "creation of educational laboratories". Results. Based on the presented results, we can give several examples of the use of this technology in new schools, aimed at analyzing and highlighting the most important for practice three years of experience in using STEAM technology in education.

The essence and characteristics of education are described We need to consider the organization of educational laboratories based on the proposed approaches to the use of STEAM technologies, methods of creation. Most importantly, examples of the use of such technology in a modern school should be given to school practice, types of laboratories, the purpose and content of teaching, and be focused on educational outcomes.

In conclusion. During our research, we identified the most effective ways to create and rationally use basic school educational laboratories using STEAM technology in the educational process, and the most important aspects of using this technology at school.

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