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METHODOLOGY FOR USING STEAM TECHNOLOGY IN PRIMARY EDUCATION

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Abstract. *The modern education system requires the widespread introduction of innovative technologies. Especially in primary education, modern approaches, in particular STEAM technology, play an important role in developing students' thinking, problem-solving and teamwork skills. This article discusses the methodology for using STEAM (Science, Technology, Engineering, Art, Mathematics) technology in primary education, its pedagogical capabilities, integration into the educational process and its role in increasing student activity.*

Keywords: *STEAM technology, primary education, integration, methodology, innovative approach.*

In our republic, great attention is paid to organizing the process of modernization of educational stages on the basis of innovative approaches and ensuring interdisciplinary integration aimed at forming the natural and scientific literacy of primary school students, and introducing STEAM - educational technology focused on practical research activities.

The Decree of the President of the Republic of Uzbekistan No. PF-5712 dated April 29, 2019 "On approval of the Concept for the Development of the Public Education System of the Republic of Uzbekistan until 2030" clearly defines such tasks as "the introduction of general education programs and new state educational standards that meet the requirements of a modern innovative economy, taking into account the special emphasis on the development of STEAM disciplines and competencies and skills for critical thinking, independent processing and analysis of information."

At the same time, the Resolution of the President of the Republic of Uzbekistan No. PQ-4623 “On measures for the further development of the sphere of pedagogical education” dated February 27, 2020 set the task of developing general secondary education based on national pedagogical experience and international educational programs. The introduction of STEAM - educational technology, designed to work with tasks that meet the requirements of international assessment programs (PIRLS, PISA, TIMSS, EGMA, EGRA), into primary education, in particular, in the teaching of natural sciences, requires improving the model and methodological conditions for implementing this process.

Today, the promising technology of education is “STEAM” technology. STEAM education is one of the main global trends. Currently, the technical direction is given priority. In many children's institutions: preschool educational organizations, clubs, schools, IT technology classes, STEAM laboratories and LEGO centers are being created. The format of additional education and upbringing provided to children is changing.

Pedagogical technology, their use in the educational process, ways and methods of Russian pedagogues A.A. Andreev, V.P. Bespalko, M.T. Gromkova, M.V. Klarin, Mila Novik,

American pedagogues B. Bloom, D. Kratval, M. Trondund, D. Carroll, Dj. Block, L. Endersson, R. Gengs, L. Brigts, Bob Kizlik, British scientist A. Romishevsky, Uzbek scientists J. Yoldoshev, B. L. Farberman, N. Sayidakhmedov, M. Ochilov, B. R. Adizov, M. Kh. Mahmudov, A. Ziyamuhammedova, B. It is described in the works of Ziyamuhammedov, U. Tolipov. The trend of pedagogical technology that emerged in the USA in the 70s-80s of the last century spread to almost all developed countries, was recognized and supported by such an influential organization as UNESCO, and is currently being successfully adopted in many countries.

The issue of organizing integrated educational processes in our country has also been studied very consistently. On this topic, A.Zunnunov, A.Sulaymonov, U.Musaev, R.Mavlonova, R.Burkhonov, R.Safarova, B.Abdullaeva, Sh.Yusupova, D.Rejapova, Z.Azimova, T.Najmiddinova, R.Juraev, Kh.Nazarova, E.Turdikulov, M.Mirqosimova, T.Nuriddinov, N.Abdullaeva, N.Abdusamatova, Kh.Yulbarsovalar, Sh.Musurmonova; The problem of forming natural science and environmental knowledge in students was studied by A. Azizov, A. Abdulkasimov, I. Abdullaev, M. Alikulova, P. Gulyomov, N. Mamashokirov, A. Tukhtaev, G. Komilova, P. Baratov, S. Matsaidova, Sh. Otaboev, S. Sulaymanova, M. Toshtemirova, G. Kasimov, F. Ochilov. Some aspects of improving the methodology of teaching natural science were covered by M. I. Nuritdinova, Sh. Mirzaakhmatova, D. Polatova, Kh. B. Norbotaev, J. Tolipova, Sh. R. Turdiev, I. Yu. Aripo, F. Mardonova, F. Avazboev, who conducted a number of studies on the essence of using the STEAM approach in education. The issue of introducing international assessment programs into primary education and innovative technologies into the teaching process was studied as a scientific research problem by B.Kh. Khodjaev, M. Askarova, G. Kasimova, A. Matkarimov, and others[1].

As is known in our country, the “On Education” and the essence of the National Curriculum set the task of training highly qualified specialists who can meet the requirements of world standards. In particular, the main goal of education at present is to radically reform the education sector, completely free it from ideological views and stereotypes left over from the past, and create a national system of training qualified personnel at the level of developed democratic countries, meeting high spiritual and moral requirements.[2].

In the current conditions, the process of teaching, that is, the formation of a single form, the achievement of high efficiency in teaching is carried out through the development and application of pedagogical technologies. One of the conditions for the use of pedagogical technologies in the educational process is related to the teacher's creative qualities. Due to the lack of creative qualities of the teacher, students, although they have interesting and wonderful ideas, are slow to express them. Therefore, the methods used in the educational process are determined by the fact that they do not serve to form free, independent thinking skills in students.

[1] Onaxon Mannapovna Jabborova (2022). BOSHLANG‘ICH TA’LIMGA TADBIQ ETILADIGAN OPTIMAL XALQARO BAHOLASH DASTURLARI. Academic research in educational sciences, 3 (1), 776-779. doi: 10.24412/2181-1385-2022-1-776-779

[2] Saloxitdinova, N. Z. M. Q. (2024). STEAM TA’LIMINI JORIY QILISHNING PEDAGOGIK ASOSLARI (TABIIY FANLAR MISOLIDA). *Academic research in educational sciences*, *5*(NUU Conference 1), 94-98.

The methodology of teaching subjects considers issues related to the teaching of all subjects at school: the ideological orientation of teaching, the unity of teaching content and methods, the consistency between the forms of educational work, and the integrity and development of all educational elements. It also determines the criteria for involving the STEAM educational approach in the teaching of subjects.

STEAM develops the intellectual abilities of the student by involving him in scientific and technological creativity. It is based on a curriculum aimed at developing students' interest in the exact, natural sciences. STEAM consists of six stages: question, discussion, design, construction, testing, development. These stages are the basis of the project. In turn, students as a team use all the opportunities, act together, use them is the basis of creativity and innovation. Thus, the simultaneous study and application of science and technology helps to create many new innovative projects. For whom and the deadlines for implementation of these projects play an important role. Conditions for the introduction of STEAM technology:

1. It is necessary to search for and support gifted children and create a comprehensive system for this;

2. It is necessary to develop a creative environment in each secondary school to identify gifted children.

3. At the same time, it is necessary to develop a system of support for gifted children.

This includes, first of all, 24-hour educational institutions. In this case, conditions should be created for the research of gifted children.

4. It is also necessary to encourage teachers of students who have achieved high results.

5. It is necessary to attract talented young people to the teaching profession.

STEAM education is distinguished by the following features:

- Integrating education by subjects, not by subjects.

- Learning to apply scientific and technical knowledge in real life. In this case, students increase their engineering knowledge and try to create a prototype of what they see.

- Developing critical thinking skills and teaching problem solving. In this, the knowledge gained helps to overcome difficulties encountered in everyday life.

- Creating a sense of self-confidence. When students start making various machines and objects, they strive for the goal and help their self-confidence grow.

- Active communication and teamwork. It teaches students to think freely, communicate with each other, and make presentations.

- Developing interest in technical sciences. The task of STEAM education is to develop students' interest in natural and technical sciences.

- creative and innovative approach to projects. STEAM-teaching consists of 6 stages, which are questions, discussion, design, construction, testing and development.

- creates a basis for students to learn and build a career. This will also help them choose a profession in the future.

- provides students with the opportunity to create technological innovations, that is, to keep up with the times, while science and technology are developing.

- STEAM- will also affect the change in the school curriculum. In this, we will educate students in accordance with international standards.

In order to improve these tasks, it will certainly require great responsibility, creativity, and a desire to live in harmony with the times from teachers[3].

In the STEAM program, the child begins to demonstrate comprehensive intellectual, planning, and selection skills. In various activities, relying on their knowledge and skills, they begin to make their own decisions, and demonstrate independence in various activities, namely games, communication, educational and research activities. In order to further enhance the effectiveness of the STEAM program, special experimental rooms, circles, which directly involve children in education and inventions, creative competitions, games that further increase their intellectual potential, and the identification and development of children's abilities by conducting each activity on the basis of information and communication technologies are of great importance in educational organizations.

Speaking about the importance of STEAM education in increasing student activity in primary grades, first of all, students'

In conclusion, it is necessary and necessary for every creative and imaginative primary school teacher to identify and constantly develop the creative thinking abilities of their students in a timely manner. The main goal of the five important initiatives put forward by our esteemed President today is to identify and develop the unique creative abilities of students and young people and to organize their free time meaningfully and effectively.

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