STEAM technology and the importance of gamification in it

Mokhinur Uzokjonova
Andijan State Pedagogical Institute

Abstract: This article provides information about STEAM technology, STEAM education system, the impact and importance of STEAM approach on educational effectiveness.

Keywords: education, types of education, forms of educational organization, new ideas, educational materials, educational information, STEAM technology, Presidential schools, knowledge, skills, skills, assessment

Today, when technology and information exchange are growing and developing, children are becoming very smart and intelligent. They are also growing up along with new era technologies. It is not wrong to say that the use of non-traditional methods in their education has become the demand of the times.

Unlike education, STEAM technology ensures that knowledge is not isolated, but mutually proportional. The student develops the skills of non-standard thinking, finding multiple solutions to problems, and creativity, which will be very useful in his future work.

STEAM was developed in America. Some schools took into account the careers of graduates and decided to combine subjects such as science, technology, engineering and mathematics, and this is how the STEM system was formed. (Science, Technology, Engineering and Mathematics). After all, children want to learn well and apply it immediately.

The world is changing, even if education does not stand still.

The changes in recent decades are welcome, but at the same time, they make us nervous. New job types and even entire professional fields are emerging every day, so modern teachers must consider whether the knowledge and skills they teach are up to date.

Knowledge helps you find your idea, but real work turns that idea into reality.

If we say that the main goal of traditional education is to teach knowledge and use this knowledge to think and create, the STEAM approach teaches us to combine acquired knowledge with real skills.

The most famous example of the STEAM approach is the Massachusetts Institute of Technology (MIT). The motto of this world university is “Mens et Manus” (Mind and Hand). The Massachusetts Institute of Technology has developed STEAM courses to give children an opportunity to learn and be exposed to the

concept of STEAM in advance, and even created STEAM Learning Centers at some educational institutions.

According to statistics, since 2011, the level of demand for STEAM professions has increased by 17%, while the demand for regular professions has increased by only 9.8%. But what is the reason for such a high demand? In many countries, STEAM education is a priority for several reasons:

In the near future, there will be a very high demand for engineers and high-tech production specialists in the world, and therefore in Uzbekistan.

In the far future, we will have professions related to technology and high-tech manufacturing together with the natural sciences, especially bio and nanotechnology specialists.

STEAM education provides a blended environment where students begin to understand how to apply scientific methods in practice. In this program, students study robotics, designing and building their own robots, along with mathematics and physics. Special technological equipment is used in the lessons.

The following statements were made at the STEAM forward international conference held in Jerusalem in 2014:

 Getting kids involved in STEAM. This education should begin at preschool age, so programs should be included in kindergartens.

 Science is fun! Science should be fun, it should be interesting and engaging for students.

The importance of STEAM technology. Gamification: learning through play. Unlike education, STEAM technology ensures that knowledge is not isolated, but mutually proportional. The student develops the skills of non-standard thinking, finding multiple solutions to problems, and creativity, which will be very useful in his future work.

For example: Robotics is one of the promising fields in today's technologically advanced era. When STEAM and robotics classes are conducted in harmony, students will acquire the following knowledge and skills:

- C programming language
- Fundamentals of electronics
- Making simple and complex schemes
- 3D design and 3D modeling
- Outputting 3D models from a 3D printer
- Arduino programming
- Working with transistors and microchips
- Working with additional modules and sensors (RGB, WiFi, PIR, LCD display, RFID)
- Create various Arduino projects independently

In our country, the President's schools provide education according to the "STEAM" program.

Graduates of the 4th grade of general education institutions can enter based on the results of logical thinking tests, written exams and interviews. Evaluation is carried out in accordance with the procedure established by the Ministry of Public Education.

The educational process is carried out in English according to curricula and programs developed in cooperation with foreign educational institutions. Teaching in grades 9-11 provides for individualization of the educational process by choosing certain subjects and their level of study, taking into account the interests and characteristics of students.

The program "STEAM - education" (Science - natural sciences, Technology - technologies, Engineering - technical creativity, Art - art, Mathematics - mathematics) is introduced in schools. Based on the interests of the students, it is envisaged to conduct practical training outside the classroom.

Graduates are given a diploma of an international level program (International Baccalaureate, Advanced Placement or International Advanced Levels) along with a state-approved educational document (certificate, attestation). With such a diploma, it will be possible to enter the leading higher education institutions of foreign countries.

SCIENCE (natural sciences) is included in the STEAM education system, and the use of pedagogical technologies in the education of students is the focus of every natural science teacher performing pedagogical activities in the educational system. It is necessary. In the teaching of natural sciences, the individual organization of students' cognitive activities is mainly used together with the lesson and in extracurricular activities. These include creating crossword puzzles for students on specific topics, conducting observations and experiments, preparing lectures and abstracts, and preparing materials for competitions held on various topics.

In short, the STEAM education system is rich in new methods and developments. With this system, students are brought up keeping pace with technology. Using new methods of teaching natural sciences, increasing students' interest in science is aimed at easy learning of science. Today, everyone is interested in the technology of the young generation. So, they learn with curiosity in this system.

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