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The Essence of using Steam Educational Technology in Primary Education

Qudratova Shaxnoza Baxtiyor qizi
Tashkent University of Applied Sciences, Department of theory and methodology of primary education dotsent v.b.

Fayzullayeva Lobar Nuraddin qizi
Student at Tashkent University of Applied Sciences

Abstract. *This article sheds light on the essence of using STEAM technology in the primary education process. It analyzes priority aspects such as interdisciplinary integration, the development of students' creative thinking, and the consolidation of knowledge through practical experiences. The study highlights the advantages of the STEAM method in developing problem-solving skills, increasing motivation, and organizing interactive lessons among elementary school students. Additionally, brief summaries and recommendations for implementing this approach in practice are provided.*

Key words: *STEAM educational technology, primary education, integration, modern education, efficiency, method, practice, production.*

Nowadays, the demands placed on primary education are changing rapidly. It is no longer enough to teach children only by rote; they must be able to think independently, explore, and solve simple real-life problems on their own. For this reason, modern approaches are being introduced into the teaching process. The most effective of these is the STEAM educational technology, which links the sciences together and boosts students' interest and creativity. The main essence of using STEAM in elementary school is to present learning to the child in a more interesting and relatable way. Small experiments, modeling, or small-scale projects increase student engagement, and they learn by doing rather than just listening to a lecture. In this regard, STEAM plays a crucial role in developing primary education in line with modern demands.

The use of STEAM technology in primary education has, frankly, become quite widespread in recent years, and I think there's a reason for it. Because with ordinary teaching methods, you can't keep today's children focused for long. Especially for a child accustomed to phones, tablets, and the internet, simply opening a notebook and saying “here, read” doesn't yield much results. That's why many teachers have started adding small, hands-on activities to their lessons. STEAM is exactly about that—connecting a lesson with movement, imagination, and curiosity.

When I first saw this technology myself, I didn't quite understand it at first: I thought, “Won't the kids get confused if a lesson mixes math, technology, and art?” But later, after observing it in practice, my opinion completely changed. For example, in one of my lessons, third-grade students built a small bridge model out of matchsticks. This seemingly simple activity actually gave them a natural understanding of measuring length, structural stability, and angles. The most interesting part was that the children, without even realizing it, had “dived into” physics and mathematics.

S — Science. In this section, students are taught about nature, life, and phenomena. For example, explanations are given about plants, animals, or natural phenomena.

T — Technology: Students acquire knowledge using various tools and devices. For example, observing and studying data with a telescope, a microscope, or computer programs.

E — Engineering This section consists of hands-on activities. Children develop engineering thinking by building various models, constructing devices, or solving problems.

A — Art At this stage, students engage in creative activities: drawing, writing stories or essays. Through this, they have the opportunity to express their ideas and expand their imagination.

M — Mathematics In this section, children apply their mathematical knowledge in practice through measuring, calculating, and solving simple problems.

One of the strongest aspects of STEAM is this: a child doesn't realize they are learning, but they are. For example, it teaches problem-solving through real-life tasks. A simple example is when a group of students at school was given the assignment to “build a small windmill.” They experimented with how to fold the paper, how to position the blades, and even tested why the spinning speed changes depending on the wind direction. I realized that it's precisely these processes that bring the student to life, not just demanding that they “memorize.”

There's another aspect: STEAM strengthens children's ability to express their opinions freely. Some children are very shy; in a regular class, they won't raise their hands or ask questions. But during hands-on activities, they become active without even realizing it. For example, during project work, suggestions like “If it were up to me, we should place this on this side,” or “This part is about to collapse; can we add another pillar?” come up. This teaches them to speak spontaneously, think, and defend their opinions.

STEAM technology is also interesting in that it helps extend the lesson not only inside the classroom but sometimes outside as well. For example, the science teacher observed the trees in the schoolyard with the students and then returned to the classroom to build a model of their growth. One child even asked, “Does the apple tree in our yard grow like this too?” It's a very simple question, but it shows that the child is beginning to connect real life with education.

Teamwork also develops well in STEAM lessons. Not every child is equally active, but when they work in a group, they divide up the tasks: someone draws, someone measures, and someone else checks. Sometimes small disagreements also occur, but that's not a bad thing—in fact, this process teaches a child how to discuss, compromise, and explain their ideas to others. In modern education, these skills are very important. STEAM not only liven up lessons in elementary school but also strengthens children's critical thinking. This is the biggest advantage of the technology—it instills in a child the spirit of “Don't be afraid, try it.” Because during an experiment, no one is afraid of making mistakes. The teacher doesn't punish mistakes; instead, they say, “Let's try again.” As a result, the student begins to believe in themselves, and this confidence plays a huge role in the next stages.

In elementary school, STEAM education makes the learning process more engaging and effective for children. Each letter—Science, Technology, Engineering, Art, and Mathematics—helps develop different skills in students. Through STEAM, children not only acquire theoretical knowledge but also develop practical application, problem-solving, and creative thinking skills. At the same time, they also learn to work in a team, take responsibility, and communicate their ideas to others. STEAM makes elementary education interactive and engaging. It develops independent thinking, creativity, and practical skills in children. Therefore, STEAM technology is an important tool not only for imparting knowledge but also for preparing children for life in the future.

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