

## **METHODS OF SELF-DEVELOPMENT FOR STUDENTS THROUGH STEAM EDUCATION**

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### **Annotation:**

This article discusses teaching methods based on the STEAM approach, as well as the development of skills in students for conducting experiments, building models, solving problems, collaborating, and working through creative processes. Additionally, it highlights the importance of providing school students not only with some ideas but also with the opportunity to apply and implement them in practice.

**Keywords:** STEAM, unconventional thinking, creativity, model, invention, approach, robotics, collaboration, team, adaptability.

### **Introduction**

STEAM is an important approach in modern education that helps in deeper and more effective assimilation of knowledge and skills by linking different subjects and their components. It is not just about integrating subjects, but also revealing the connections between them, preparing students for research activities, and developing the skill of collaborating together to achieve common goals.

This approach to mastering natural sciences is characterized by several features:

**Clear perception in the process of understanding:** Teaching based on the STEAM approach allows students to examine the topic from different angles and gain a deeper understanding of it. For example, linking a text studied in a literacy lesson with natural sciences and art enriches its content even further.

**Development of thinking:** Focusing on a topic or concept across various fields of study and applying it through different processes helps in solidifying its understanding and stimulates critical thinking [2;31-p].

### **Analysis of literature on the topic**

John Dewey was a famous educator who conducted research on teaching and learning methodologies. According to his ideas, providing students with knowledge through practical experience and developing their thinking skills aligns with the core principles of STEAM education. Dewey emphasized that the learning process should not be limited to theoretical

knowledge but should also engage students in active participation, allowing them to learn through their own experiences.

**Effective formation of skills:** Teaching based on the STEAM approach helps students develop critical thinking, problem-solving, project creation, collaboration, and other essential skills.

**Unleashing creative potential:** Integrating various subjects allows students to think creatively and generate new ideas. They find unique approaches to the topic, think outside the box, and apply their existing knowledge and life experiences in original ways.

**Connection to real life:** Teaching based on the STEAM approach teaches students to apply knowledge to real-life situations, demonstrating its practical significance. It creates a foundation for finding various solutions to social problems and developing social skills.

**Increased motivation:** Engaging and diverse activities boost students' motivation for learning and encourage their active participation.

**Knowledge applicable in multiple fields:** STEAM education does not limit itself to a single field. For example, physics and chemistry are applied in engineering, while biology and computer science are used in technology and medicine. In other words, STEAM education integrates knowledge that is utilized across a wide range of diverse fields.

**Teamwork and communication:** In STEAM projects, students are taught the skills of working in teams, communicating effectively with others, and solving problems together. These skills are valuable not only in scientific activities but also in everyday life [6;14-p].

### **Research methodology**

Moreover, through STEAM education, students can participate in addressing global technological, environmental, and social issues. In the future, STEAM education is expected to play a significant role in the world economy and society, as it accelerates the development of science and technology and unlocks human creative potential.

STEAM is an integrated learning approach that ensures a constant connection between standards, assessment, and lesson design implementation. A true STEAM experience includes two or more standards from the fields of science, technology, engineering, mathematics, and art. Inquiry, collaboration, and process-based learning are central elements of the STEAM approach.

### **Analysis and results**

Dewey advocated for connecting education with real-world problems and also supported the development of students' critical thinking and decision-making abilities. STEAM education follows this very principle by integrating science, technology, engineering, art, and mathematics to encourage students to learn through practical work and projects, preparing them to solve real-life problems.



Dewey's pedagogical views, particularly the idea of "learning by doing," have served as a fundamental basis for shaping the practical and interdisciplinary approaches of STEAM education. He promoted methods aimed at developing students' creative and analytical thinking skills, which aligns with the central principles of STEAM education.

The integration of art is crucial for a genuine STEAM initiative. To achieve these goals, schools must consider several factors:

- by considering these factors, schools – can effectively implement the STEAM approach to prepare students for future challenges and opportunities.
- collaboration in planning with representatives from different fields within each team: Involves teachers from various disciplines working together to plan lessons and activities that integrate STEAM principles.
- professional development for all subject teachers on STEAM practices and principles: Ensures that educators receive the necessary training to effectively implement STEAM approaches in their classrooms.
- developing STEAM frameworks for curriculum design and assessment: Teachers need to create frameworks that align with STEAM concepts to guide the development of curriculum and assessment processes.
- adapting and clearly defining standards and assessments: It's important to tailor standards and assessments to fit the integrated approach of STEAM education, ensuring they align with both individual subjects and cross-disciplinary skills.
- designing continuous implementation processes and strategies for lessons: Teachers should develop consistent and strategic methods for delivering STEAM lessons, ensuring they are engaging, effective, and collaborative.

### **Conclusions and suggestions**

STEAM education not only focuses on teaching technologies but also fosters creative thinking and analytical approaches in students. This, in turn, contributes not only to the advancement of science and technology but also to the development of innovative approaches and effective problem-solving in society. This educational direction will hold great significance in all fields worldwide in the future.

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