

MODERN APPROACHES TO TEACHING GEOMETRY WITHIN STEAM EDUCATION

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Abstract

This article explores modern approaches to teaching geometry within the STEAM (Science, Technology, Engineering, Art, Mathematics) educational framework. It emphasizes the importance of interdisciplinary teaching, the use of modern digital tools, and the development of students' creative and analytical thinking skills through geometric education.

Keywords: Geometry, STEAM education, interdisciplinary learning, technology integration, creativity, project-based learning, digital pedagogy.

Introduction

In today's rapidly evolving world, education systems must adapt to the needs of the 21st century. Traditional teaching methods, focused mainly on memorization, are no longer sufficient for developing students who can think critically and solve real-world problems. One of the most promising approaches is STEAM education, which integrates various disciplines to provide students with a holistic learning experience.

Main Part

1. The essence of STEAM education

STEAM education combines five key disciplines — Science, Technology, Engineering, Art, and Mathematics — to encourage students to explore, create, and innovate. In the context of geometry, STEAM education means that students learn mathematical principles through experimentation, construction, and visualization.

2. Geometry as a bridge between disciplines

Geometry is one of the most universal languages connecting science, technology, and art. By integrating geometry with engineering and design projects, students can see how mathematical theories translate into tangible results.

3. The role of modern technologies in geometry teaching

The use of digital technologies has transformed the way geometry is taught. Interactive software such as GeoGebra, AutoCAD, and Desmos allows students to experiment with geometric figures in real time, visualize transformations, and explore spatial relationships.

4. STEAM projects and practical examples

Implementing STEAM in geometry can be achieved through project-based learning. For instance, students can design a model of an eco-friendly building, calculate the geometric properties of structures, and visualize their design in 3D software.

5. Challenges and recommendations

Despite its advantages, integrating STEAM into geometry teaching faces some challenges, such as lack of teacher training, limited resources, and insufficient technological infrastructure. To overcome these obstacles, it is necessary to provide teachers with professional development, create interactive learning environments, and encourage collaboration between educational institutions and tech companies.

Conclusion

Modern approaches to teaching geometry within STEAM education open new opportunities for both teachers and students. Through interdisciplinary integration, the use of digital tools, and creative problem-solving, geometry becomes not just a theoretical subject but a practical and inspiring field of exploration.

References

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