



Innovative Approaches To Improving The Methodology Of Teaching Mathematics In General Secondary Schools

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ABSTRACT

This thesis investigates the transformation of mathematics teaching methodology in the modern educational system, focusing on the role of innovative pedagogical technologies in developing logical and abstract thinking among students. It analyzes the problems of abandoning traditional rote-learning systems, integrating mathematical concepts with real-life practices, and ensuring interdisciplinary integration.

KEYWORDS: Mathematics methodology, innovative education, logical thinking, competency-based approach, interdisciplinary integration, problem-based learning.

INTRODUCTION

The modern era of development and digital technology imposes completely new demands on the education system, particularly on the methodology of teaching exact sciences. Mathematics is not merely a subject consisting of calculations and dry operations; rather, it is a primary tool that shapes an individual's logical thinking, strategic planning, and problem-solving skills in challenging situations. However, the traditional teaching methodology formed over many years has often directed students toward memorizing ready-made formulas and rules. This, in turn, leads to fear and a loss of interest in the subject among young people. Today, improving the methodology of teaching mathematics and organizing lessons using real-life examples and interactive methods has a more urgent significance than ever before.

1. Competency-Based Approach and Problem-Based Learning Technology

The first condition for increasing the effectiveness of mathematics teaching is the full implementation of a competency-based approach in education. This approach teaches students not just to acquire mathematical knowledge mechanically, but to apply it in real-life situations encountered in daily life.

In modernizing the methodology, problem-based learning technology plays a leading role. A teacher should start a lesson not by explaining a ready-made rule, but by creating a problem situation whose solution traces back to mathematical regularities. For instance, problems related to economic processes, construction, logistics, or household management stimulate interest in students. In the process of seeking solutions to the problem, students independently draw conclusions, analyze, and comprehend the essence of mathematical laws. This method transforms the student from a passive listener into an active researcher.

2. Interdisciplinary Integration and Digital Technologies

Using interdisciplinary integration yields high results in increasing the attractiveness of mathematics lessons. Mathematical pedagogy should not be limited to its own shell but must be inherently linked with physics, computer science, chemistry, biology, and even history and art. When a student observes the place of geometric shapes in nature, architecture, and visual arts, they perceive how elegant and practical the science truly is.

At the same time, introducing digital and multimedia technologies into the lesson process is an indispensable part of modern methodology. Computer programs and interactive models that visually demonstrate abstract mathematical concepts, spatial bodies, and the dynamics of functions develop students' imaginative capacities. Along with saving lesson time, this method enhances both the emotional and intellectual density of the class.

3. Organization of Independent and Creative Activities of Students

One of the main principles of the new methodology is the harmonization of an individual approach with a collective creative environment in the classroom. Working in small groups and applying project-based learning methods in mathematics lessons generate a healthy dialogue and a culture of opinion exchange among students. In the process of performing tasks as a group, students learn to defend their hypotheses, listen to the opinions of others, and arrive at a common correct conclusion.

The educator should not limit themselves only to talented students during the lesson but must create a system of step-by-step progressive, simple, and interesting tasks for children who find it difficult to master the subject. Only through this approach can each student's self-confidence in the classroom increase, and the general level of mathematical literacy rise systematically.

Conclusion

In conclusion, modernizing the methodology of teaching mathematics is a demand of the times. The stage of organizing lessons solely by forcing the memorization of dry formulas and rules has outlived its purpose. A modern mathematics teacher must connect lessons with real life, utilize innovative pedagogical technologies effectively, and awaken critical and logical thinking in students. Only through this approach can we achieve the education of well-rounded individuals who will be capable of creatively and logically solving any complex technological and economic problems in the future.

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