

## **PROGRESSIVE METHODS OF TEACHING MATHEMATICS IN HIGHER EDUCATIONAL INSTITUTIONS**

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**Annotation:** This thesis analyzes advanced and innovative methods used in teaching mathematics in higher education institutions. The effectiveness of approaches aimed at organizing mathematics lessons based on modern technologies, developing independent thinking, logical analysis and practical competencies in students is highlighted. The topic is analyzed in depth through examples of using information and communication technologies, an integrated approach and interactive methods in teaching processes.

**Keywords:** mathematics education, higher education, innovative methods, digital technologies, competence, interactive methods, problem-based learning.

### **INTRODUCTION**

Teaching mathematics in the higher education system is currently undergoing a period of profound reforms. In modern society, digital literacy, logical thinking, and an analytical approach are among the important competencies for every specialist. Therefore, mathematics is considered not only theoretical knowledge, but also a science that forms practical thinking. As a result, the need for interactive teaching processes, the introduction of strategies that encourage student activity, and the use of new pedagogical technologies is increasing. Based on these needs, this thesis is devoted to the analysis of advanced methods in teaching mathematics.

### **MAIN PART**

One of the most effective approaches to teaching mathematics in higher education institutions is the problem-based teaching method. In this method, lessons are organized not in the form of traditional lectures, but on the basis of real-life issues and situations requiring complex analysis [1]. The student independently searches, expresses his or her own point of view on the problem, and comes to a scientific conclusion. For example, explaining the theory of probability based on a situation related to the insurance system, or analyzing integrals through economic functions, not only consolidates knowledge, but also reveals its practical significance.

One of the next progressive methods is the integration of information and communication technologies into the educational process. Using modern platforms (GeoGebra, Mathematica, Desmos, Wolfram Alpha), it is possible to build complex graphs, model, automate algebraic transformations, and visually present knowledge through mathematical experiments. This increases the student's interest in the lesson, strengthens the individual approach, and encourages independent work. Especially in the context of distance learning, interactive platforms serve to maintain the quality of the lesson without reducing it [2].

Also, short and effective methodological solutions in the lifehack style are gaining great importance. During the lesson, short but effective algorithms, formulas memorization techniques, and explanations based on logical schemes help students quickly and effectively master the educational material. This approach develops rapid analytical skills, especially in students studying in the fields of pedagogy and technology.

Another progressive approach is the project-based learning method. The processes of solving mathematical problems in a team, presenting results, and mutual evaluation form not only logical thinking, but also communicative and social skills. In this case, the student sees himself as an independent researcher, decision-maker, and thinker. Project work (mathematical models, economic analyses, and practical applications) prepared on this basis is relevant to real life, relevant, and interesting. In addition, an integrated interdisciplinary approach also plays an important role in mathematics education. For example, physics, computer science, or economics-develops the student's interdisciplinary thinking ability. This methodological approach forms integrative competencies and serves to train competitive personnel [3].

Another relevant and progressive approach to increasing the efficiency of teaching mathematics in higher education is the differentiated teaching method. According to this approach, students are divided into groups according to their level of knowledge, abilities and learning styles, and individual approaches are determined for each group. For example, high-level students can be given tasks to analyze complex mathematical models and prove the theories put forward through practical cases. At the same time, it is advisable to facilitate understanding by explaining the topic through graphs and using visual aids for students with a low level of basic knowledge. This method allows each student to develop in accordance with his or her potential and ensures the principle of equal opportunities in education.

In addition, a reflective approach to mathematics education, that is, methods that encourage students to analyze their own learning process, are also yielding high results. At the end of the lesson, students are asked questions such as “What mathematical principle did I understand today?”, “What difficulties did I encounter?”, “Where can I apply this knowledge?”, so that they understand their own learning strategy. In this way, the student’s self-control and metacognitive thinking develop, and he begins to take a conscious, deep approach to mathematics. This method is especially important in developing self-management and independent learning skills [4].

### **CONCLUSION AND DISCUSSION**

In conclusion, for effective teaching of mathematics in higher education, it is necessary to integrate modern, interactive, student-centered approaches into traditional methods. The problem-based approach, information technologies, group project-based methods, interdisciplinary integration, and methodological life hacks analyzed above all serve to improve the quality of education. Each teacher must apply these strategies in a way that is adapted to the needs of their students. Only then will we be able to train modern thinkers, have analytical skills, and be able to make independent decisions in practice.

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