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METHODOLOGICAL AND INNOVATIVE APPROACHES TO DEVELOPING PROBLEM-SOLVING COMPETENCE IN PRIMARY SCHOOL STUDENTS

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Abstract. This article provides a comprehensive analysis of modern pedagogical approaches to developing problem-solving skills in mathematics at the primary education level. Within the scope of the study, the didactic potential of interactive methods, digital learning platforms, STEAM integration, and gamification technologies in fostering students' problem-solving competencies is examined. In particular, the effectiveness of using interactive educational platforms such as Topqir.uz and Edugames.uz in enhancing logical thinking, independent reasoning, and the ability to solve mathematical problems among primary school students is empirically substantiated. The obtained results demonstrate that the systematic use of innovative pedagogical technologies significantly improves students' mathematical literacy, analytical thinking, and practical skills.

Keywords: primary education, problem solving, innovative methods, interactive learning, STEAM, ICT, digital platforms, mathematical thinking.

Introduction. One of the primary objectives of mathematics education in the primary school system is to develop students' ability to solve mathematical problems. The process of problem solving serves not only as a means of performing arithmetic operations, but also as an important didactic tool that fosters students' logical thinking, analytical reasoning, generalization, modeling, and problem-solving competencies [1].

Within the framework of the modern educational paradigm, the widespread implementation of innovative pedagogical technologies, interactive methods, and digital learning environments is bringing primary mathematics education to a qualitatively new level. In particular, information and communication technologies (ICT), the STEAM approach, gamification elements, and online interactive platforms are recognized as key factors in enhancing the effectiveness of the educational process [2].

From this perspective, educational platforms such as Topqir.uz and Edugames.uz contribute to the interactive and engaging acquisition of mathematical problem-solving skills among primary school students. These platforms enable learners to solve problems in a game-based format, develop quick and logical thinking, automatically check results, and independently assess their knowledge [3,4].

The aim of this study is to scientifically substantiate and analyze the effectiveness of innovative methods and digital educational platforms in developing mathematical problem-solving skills in primary school students.

Research Methods.

In the course of the study, a number of scientific and pedagogical methods were employed to determine the effectiveness of developing mathematical problem-solving skills in primary school students.

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First, using the method of pedagogical analysis, scientific literature, curricula, and advanced pedagogical practices related to the methodology of teaching mathematics in primary education were systematically studied and generalized.

In addition, the observation method was used to analyze the application of innovative teaching methods in the process of solving mathematical problems in primary classes. This method made it possible to assess students' activity, level of participation, and learning outcomes.

Within the study, the following interactive methods were applied during lessons: brainstorming, clustering, pair work, and the "fishbone" (Ishikawa diagram) method. These approaches contributed to the development of students' logical thinking, analytical reasoning, and problem-solving competencies.

Furthermore, the use of digital educational platforms played a significant role in the research. In particular, the Topqir.uz platform includes mathematical tasks aimed at developing logical thinking, quick tests, and progressively complex problem sets. Through rapid calculation exercises, logical tasks, and time-based activities, students' analytical thinking skills were enhanced.

At the same time, the Edugames.uz platform was used to implement interactive mathematical games such as mathematical dominoes, arithmetic races, problem-solving games, digital crosswords, and puzzles. These tools helped reinforce students' knowledge, increase their interest in learning, and develop independent learning skills.

Additionally, the study incorporated the STEAM approach in teaching problem-solving. Problems were analyzed through the integration of Science (explaining quantitative processes), Technology (digital modeling), Engineering (constructive modeling), Art (graphical representation), and Mathematics (performing arithmetic operations).

Results.

The findings of the study indicate that the use of innovative pedagogical methods and digital learning platforms plays a significant role in developing primary school students' mathematical competencies. The application of interactive methods increased students' classroom engagement, improved independent thinking, and significantly enhanced their ability to solve complex problems.

The use of the Topqir.uz platform had a positive impact on the development of rapid calculation skills, the ability to solve logical problems efficiently, and the enhancement of competitive learning skills among students.

Similarly, the use of interactive games on the Edugames.uz platform increased students' interest in mathematics, transformed problem-solving into an engaging and motivating activity, and supported the development of collaborative skills.

Moreover, lessons organized based on the STEAM approach significantly improved students' competencies in graphical modeling, analytical thinking, and the application of knowledge in practical situations.

Discussion.

The results demonstrate that the integration of innovative pedagogical technologies with traditional teaching methods significantly enhances the effectiveness of primary education. In particular, digital platforms such as Topqir.uz and Edugames.uz contribute to organizing mathematics lessons in an interactive, student-centered format.

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The use of these platforms not only develops students' independent learning, quick thinking, and problem-solving skills, but also enables teachers to assess students' knowledge promptly and objectively.

Furthermore, learning processes organized through gamification and digital tools increase students' emotional engagement and help them perceive mathematics not as a difficult subject, but as an interesting and creative activity.

Therefore, the systematic and purposeful use of innovative pedagogical technologies in improving the methodology of teaching mathematical problem solving in primary education is of significant scientific and practical importance.

Conclusion.

Developing mathematical problem-solving skills in primary school students is one of the key priorities of mathematics education. The use of innovative methods, interactive approaches, STEAM integration, and digital learning platforms plays a crucial role in enhancing students' mathematical thinking and practical competencies.

In particular, the integration of educational platforms such as Topqir.uz and Edugames.uz into the learning process contributes to the comprehensive development of students' logical thinking, problem-solving abilities, independent learning skills, and mathematical literacy.

As a result, mathematics lessons become more engaging, effective, and interactive, increasing students' motivation to learn and improving the overall quality of learning outcomes.

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