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THE EFFECTIVENESS OF INTERNATIONAL ASSESSMENTS IN ENHANCING STUDENTS' MATHEMATICAL LITERACY

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Abstract: This article examines the role of the PISA international assessment in evaluating and improving students' mathematical literacy. The findings demonstrate the need to strengthen competency-based approaches, increase the use of real-life problem-solving tasks, and ensure equity in education within Uzbekistan's schooling system. Based on PISA results, recommendations are provided for modernizing the teaching process and enhancing students' functional mathematical skills.

Keywords: PISA, mathematical literacy, functional competence, quality of education, international assessment, education in Uzbekistan.

Introduction

In today's globalized environment, the quality of education is regarded as one of the most important factors of national development. Mathematics, in particular, plays a crucial role in shaping students' analytical thinking, logical reasoning, problem-solving skills, and the ability to make decisions in real-life situations. Therefore, developing mathematical literacy is not only an internal need of the educational process but also a priority task that contributes to increasing the intellectual and economic potential of society.

In modern education, students are expected not only to acquire knowledge but also to apply it, think independently, and find practical solutions. Using international benchmarks to evaluate educational quality helps ensure a systematic, objective, and comparable assessment process. One such international assessment is PISA, which aims to determine students' competencies in mathematics, reading literacy, and science, focusing on real-life application.

Unlike traditional knowledge-based tests, PISA requires students to apply their knowledge to real-world problems, use logical operations when solving tasks, and demonstrate creativity and efficiency in their thinking. PISA results provide insights not only into students' academic levels but also into the education system's characteristics, teaching methods, and teachers' pedagogical competencies.

Uzbekistan's participation in PISA has become an important step in improving the quality of education, introducing new methods, and reviewing curricula in accordance with modern requirements. PISA results enable the country to compare its educational standards internationally, identify strengths and weaknesses in students' mathematical literacy, and develop targeted strategies to address existing gaps. The assessment also informs teacher professional development, increases the use of interactive methodologies, and strengthens competency-based learning.

Since PISA tasks are designed based on everyday life situations, they aim to develop students' skills in mathematical modelling, data analysis, and drawing reliable conclusions. This contributes to stronger practical and theoretical mastery of mathematics.

Methods

This study employed several scientific methods to thoroughly examine the role and significance of the PISA international assessment program in enhancing students' mathematical literacy. The methodological basis of the research includes theories of competency-based education, analytical approaches used in international assessment systems, and modern scientific perspectives on evaluating educational quality.

Results and Analysis

The study revealed several important findings regarding the role of the PISA international assessment in developing students' mathematical literacy and its significance for Uzbekistan's education system. Analysis shows that PISA views mathematics not as a collection of theoretical knowledge but as a functional competence applied in real-life contexts. When students are evaluated through the PISA framework, they are expected not only to perform calculations but also to analyze data, model problems, draw logical conclusions, and make informed decisions. This highlights the need to modernize the content of mathematics education in Uzbekistan according to competency-based principles.

Discussion

The findings indicate that one of the most important tasks facing Uzbekistan's education system is improving students' mathematical competencies in alignment with international standards. This process requires a comprehensive review of teaching methods, pedagogical approaches, student motivation, and the overall learning environment.

Observations from local schools reveal that students often lack the ability to solve practical, everyday problems. This is largely due to the dominance of traditional, algorithm-based teaching, where lessons focus mainly on formulas and memorization. Higher-order thinking skills—such as analysis, reasoning, modelling, and decision-making—are still underdeveloped in many students.

PISA tasks, especially those at higher levels, require exactly these competencies. Therefore, incorporating problem-based learning, project-based tasks, group collaboration, hands-on activities, and real-world applications into the curriculum is essential.

Socioeconomic factors also significantly influence students' mathematical literacy. Students from low-income families, schools with limited resources, and inexperienced teachers often demonstrate lower results. PISA emphasizes educational equity, making it crucial for Uzbekistan to ensure equal access to quality education for all students.

Teacher qualification is another key factor. Effective implementation of PISA-type tasks requires teachers to be well-versed in modern pedagogical methods and capable of guiding students toward independent inquiry and higher-level thinking. Continuous professional development, practical workshops, and experience-sharing platforms are necessary.

Overall, PISA participation not only helps Uzbekistan evaluate student performance but also provides an opportunity to adapt its education system to global trends, improve curricula, and foster a more active and competency-oriented learning process.

Conclusion

The final analysis indicates that the PISA international assessment serves as a crucial diagnostic tool for evaluating and enhancing mathematical literacy in Uzbekistan's education system. The findings highlight the need to strengthen competency-based instruction, develop students' skills in applying mathematical knowledge to real-life situations, and promote higher-order thinking such as modelling, analysis, and reasoning.

PISA results show gaps in students' ability to solve real-life problems, interpret graphical and statistical information, and analyze complex tasks at multiple levels. Addressing these issues requires comprehensive reforms in teaching methods, teacher training, and learning environments.

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