

INTERNATIONAL ASSESSMENT PROGRAMS USED IN PRIMARY SCHOOL MATHEMATICS AS A FACTOR IN DEVELOPING LOGICAL THINKING

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Abstract: This thesis explores the implementation of international assessment programs (TIMSS, PIRLS, and PISA) in primary school mathematics lessons and their role in developing students' logical thinking. These programs not only assess students' knowledge but also evaluate their analytical abilities and practical application of knowledge.

Keywords: primary education, mathematics, international assessment programs, TIMSS, PIRLS, PISA, logical thinking, critical thinking, competence.

Introduction

In today's education system, the development of students' logical and critical thinking skills, alongside theoretical knowledge, has become a pressing issue. From this perspective, international assessment programs such as TIMSS, PIRLS, and PISA are effectively applied in primary school mathematics lessons. These programs not only evaluate students' knowledge based on international standards but also encourage independent thinking and reasoning.[1]

Main Part

The main objective of international assessment programs is not only to measure students' academic knowledge but also to assess their ability to apply that knowledge in real-life contexts.

For example, the TIMSS (Trends in International Mathematics and Science Study) program evaluates students' mathematical competencies through problems of varying complexity. PISA (Programme for International Student Assessment) focuses on the application of knowledge in real-life situations. Although PIRLS (Progress in International Reading Literacy Study) primarily measures reading comprehension, it also includes tasks directly related to mathematical reasoning and problem interpretation.[2]

One of the advantages of the TIMSS program is that it evaluates students' mathematical understanding and practical skills from the early grades. This allows

assessment not only of computational ability but also of reasoning, problem-solving using different strategies, and analytical interpretation of results.

In PISA, students' ability to solve everyday problems using mathematical reasoning is assessed. For instance, tasks such as calculating change during shopping, measuring distances, or interpreting diagrams help students apply mathematics to practical contexts. Thus, PISA emphasizes connecting mathematical knowledge with real life.

Similarly, PIRLS evaluates students' reading comprehension and analytical skills, which are crucial in mathematics for understanding problem statements and finding consistent solutions. In mathematics, comprehending the given condition of a problem correctly is often half of the solution; therefore, PIRLS results are also valuable for improving mathematics teaching strategies.[3]

Pedagogical Advantages of Applying International Assessment Programs

Implementing international assessment programs in primary school mathematics offers several methodological benefits:

- Encourages students not merely to memorize formulas but to explore and inquire independently;
- Develops independent and critical thinking skills;
- Fosters abilities to compare, generalize, and draw conclusions;
- Enables assessment of students' knowledge against international benchmarks.[4]

Moreover, these programs assist teachers in improving their instructional methods. By observing which skills students struggle with and in which tasks they succeed, teachers can design lessons more effectively. Consequently, international assessment programs serve as essential tools for improving educational quality and enhancing students' intellectual capacity.

It should also be noted that the results of these assessments reflect not only individual student development but also the overall performance of the national education system. Therefore, in the Republic of Uzbekistan, regular participation in international assessments has become an important aspect of state educational policy. Through these programs, international experience is studied, deficiencies are identified, and strategies for improving educational quality are developed.[5]

Conclusion

Applying international assessment programs in primary school mathematics lessons plays a significant role in developing students' logical thinking. Through these programs, students not only acquire knowledge but also learn to apply it in real-life contexts. As a result, they develop independent reasoning, analytical thinking, and the ability to draw conclusions. Furthermore, integrating international experience into the

national educational process contributes to enhancing the quality of education in Uzbekistan in line with global standards.

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