THE ROLE OF INTERNATIONAL RESEARCH IN THE DEVELOPMENT OF INTELLECTUAL ABILITIES IN PRIMARY SCHOOL MATHEMATICS EDUCATION

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Annotation. This article analyzes the issue of developing primary school students' intellectual abilities through mathematics lessons. Based on international experience and research, effective approaches in this area are discussed, with particular focus on programs such as PISA, TIMSS, and CGI. The significance of methodological approaches that support intellectual development is examined from a scientific perspective.

Keywords: Intellectual abilities, mathematics, primary education, international research, PISA, TIMSS, methodology.

One of the primary priorities of the modern education system is the early development of students' intellectual potential. In particular, mathematics holds a distinctive position as a crucial tool for intellectual development at the primary school level. Through mathematics lessons, students cultivate intellectual skills such as logical reasoning, analysis, problem-solving, mathematical modeling, and synthesis. Scientific research indicates that, in this process, mathematics instruction fosters the development of students' creative thinking abilities, teaching them an independent approach to solving complex problems.[1]

International assessment programs, particularly PISA (Programme for International Student Assessment) and TIMSS (Trends in International Mathematics and Science Study), play a significant role in evaluating the cognitive and intellectual abilities of students in primary education. According to the results of these studies, countries that have achieved high performance have implemented problem-solving-based approaches in primary education, which allow students to deeply internalize mathematical concepts.[2]

The PISA and TIMSS programs demonstrate how students are achieving success in solving complex mathematical problems, understanding intricate concepts, and applying mathematical knowledge in real-life situations. For instance, in countries with high performance, the use of competency-based approaches in mathematics education plays a crucial role, teaching students to think independently and ensuring their active participation in solving practical problems.[3]

For example, the Cognitively Guided Instruction (CGI) model is one of the successfully implemented methodologies in the United States. This model helps to significantly develop students' abilities to think independently, choose strategic approaches, and provide logical reasoning. In the CGI methodology, the teacher strives to understand students' approaches to mathematical problems and tailors the lessons to meet their individual needs, gradually increasing the complexity based on the students' developmental level.[4]

The effectiveness of the Cognitively Guided Instruction (CGI) methodology lies in its emphasis on not only imparting theoretical knowledge of mathematical concepts but also fostering the development of problem-solving processes. This approach facilitates a deeper understanding of mathematical concepts among students and contributes to the cultivation of logical reasoning skills. Furthermore, cognitive activities involving numbers, logical word problems, and various forms of mathematical games play a crucial role in enhancing primary school students' cognitive and creative capacities. Such activities are instrumental in developing students' mathematical competencies, enabling them to experiment with the creation of mathematical models and apply unconventional approaches in problem-solving.[5]

In the education system of Uzbekistan, it is crucial to introduce high-quality approaches in primary education through the use of international methodological experiences. Approaches that focus on problem-solving in the early stages of mathematics education play a significant role in developing students' analytical

thinking. The application of innovative teaching methods in education can enhance students' intellectual potential.[6]

Conclusions: In conclusion, the early development of students' intellectual potential, particularly through mathematics, is crucial for fostering critical skills. Programs like PISA and TIMSS emphasize the importance of problem-solving approaches in primary education, helping students deeply internalize mathematical concepts. The Cognitively Guided Instruction (CGI) model effectively promotes independent thinking, logical reasoning, and problem-solving skills. Adopting international best practices in Uzbekistan’s education system can significantly enhance students' analytical and intellectual abilities. By integrating innovative methods and problem-solving strategies, educators can help students gain both theoretical knowledge and practical skills to tackle real-life challenges, thus contributing to their intellectual growth.

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