

Innovative Approaches in Mathematics (Pisa and Timss Programs)

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ABSTRACT: This article describes the content of the international study TIMSS, the history of its development and development, the analysis of the accumulated experience. The essence of the modules of the education system on the basis of methodological approaches to assessing the quality of education in the native language, mathematics and natural sciences on the international research PISA and TIMSS is revealed. The content of the PISA and TIMSS model of educational opportunities is explained.

KEYWORD: PISA and TIMSS, international research, evaluation, quality of education, international, methodological approach, model.

The knowledge acquired at school determines a person's future life path. Many measure knowledge by assessment. But assessment is not a definitive measure of knowledge. It is just a tool to motivate students to be active. Each teacher has his own method of work, assessment method. For any teacher, an assessment is a stimulus or a means of holding a student for 45 minutes. In addition, there are teachers who give a higher grade or save a "5", even if the level of knowledge of the student meets the requirements.

The general analysis of students' knowledge and skills determines the level of quality of education in the country. For this purpose, during the academic year, internal and external monitoring is conducted in each educational institution. As this process is an important criterion for the development of education, the Ministry of Public Education has taken the first steps to implement international programs to assess the knowledge of secondary school students. In other words, in order to bring students' knowledge to international standards, it is planned to use assessment programs such as PISA (Program for International Student Assessment), TIMSS (Trends in Mathematics and Science Study).

PISA is an international program for assessing the literacy (reading, mathematics, natural sciences) and knowledge of 15-year-old students, conducted by the Organization for Economic Cooperation and Development every three years. It monitors the quality of students' knowledge in reading and mathematics and evaluates it on a 1000-point scale. This international program was developed in 1997 and was first put into practice in 2000. To date, a total of 7 tests have been conducted under the

116	ISSN 2690-9626 (online), Published by "Global Research Network LLC" under Volume: 2 Issue: 8 in October-2021 https://grnjournals.us/index.php/AJSHR
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PISA program (2000, 2003, 2006, 2009, 2012, 2015 and 2018), and the next tests are scheduled for 2021. Our country is also preparing to join this program in 2021. With the help of the program, changes in the education system of different countries are identified, compared and evaluated. The results of this research are followed with great interest around the world. Therefore, its importance and coverage is growing year by year. The PISA program tests are organized by the Organization for Economic Cooperation and Development with the participation of leading international organizations and national centers in the consortium.

TIMSS is an international monitoring of the quality of teaching mathematics and science in schools, organized by the International Association for the Evaluation of Educational Achievement (IEA). This study will help to compare the level and quality of knowledge of 4th and 8th grade students in mathematics and science in different countries and to identify differences in the national education system. The survey is conducted every four years by many research centers and organizations around the world, including the US Educational Testing Services (ETS-Educational Testing Services), the Statistical Center of Canada, and the International Association for the Evaluation of Educational Achievement (IEA).) with the participation of the Secretariat. Advisory committees consisting of various government experts will also be established. The TIMSS international monitoring study is also being phased out. In May of this year, the Ministry of Public Education and the UNICEF Office in Uzbekistan conducted a study on "Identifying factors that negatively affect the successful learning of students." It tested the knowledge of 4th grade students studying mathematics, reading and natural sciences in 255 selected schools across the country. Test questions were prepared based on the content and demand of TIMSS research materials for monitoring. The test materials are being summarized and analyzed in collaboration with UNICEF.

The TIMSS program was established in 1990 at the initiative of the International Association and began its first study in 1995, and was organized every four years until 2019 in 1999, 2003, 2007, 2011, 2015 and 2019. The next 8th period is scheduled for 2023.

Based on the preliminary results, it was determined that the following changes are needed in the education system:

- Based on the results of international research, make changes and additions to the content of state educational standards, curricula and textbooks in the native language, mathematics and natural sciences;
- Creation of a national database of questions on the PISA assessment program in the native language, mathematics and natural sciences and its integration into the curriculum;
- Development and implementation of additional manuals and literature based on the curriculum, which includes questions in the field of PISA assessment program;
- Organization of professional development courses in order to update the forms, methods and technologies of teaching the native language, mathematics and natural sciences and to increase the knowledge and training of teachers in this area;
- The creation of a national system for assessing student literacy in these subjects and the systematic conduct of tests aimed at assessing the formation of practical skills in 2019-2021;
- The organization of advanced training and internships of high-potential teachers and researchers of educational institutions in the leading educational and scientific institutions of developed countries;

- Establishing relations with leading educational and research centers, international and foreign organizations in the member countries of the Organization for Economic Cooperation and Development, participating in the PISA and TIMSS assessment programs, learning from the experience of advanced and developed countries achieving high results`study;
- Involvement of foreign scientists, teachers and specialists in the educational process of the centers for retraining and advanced training of managers and teachers;
- To create sufficient conditions for students to prepare for the international assessment program PISA in their native language, mathematics and natural sciences, to study independently.

Timely and high-quality implementation of the above tasks will ensure the integration of the education system of our country into the international educational process, will serve to identify gaps in the field, to identify new tasks. Most importantly, we achieve a fair and transparent assessment of students' knowledge.

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