



# Means of Improving Methodological Training of Future Primary Class Teachers Using the TIMSS International Assessment Program

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## ABSTRACT

This article gives information about TIMSS international assessment program and the tools of international assessment programs in improving the methodological training of future primary school teachers.

### Keywords:

Prospective primary school teachers, TIMSS, PISA, PIRLS, TALIS, competence, curriculum, assessment content, means

In modern days, we all understand that the renewal of our great goals is connected with the problem of training highly qualified and conscious specialists who meet the requirements of the time. At a time when our country is rapidly developing through innovative development, it is necessary to comprehensively support the creative ideas and creativity of young people, who are the successors of our future, to form their knowledge, skills and qualifications, as well as advanced foreign experiences, international It is important to improve the assessment system based on the requirements, to study international experiences, to conduct a comprehensive comparative analysis of the existing system, to closely cooperate with relevant international and foreign organizations and scientific research institutions.

For this purpose, with the decision of the Cabinet of Ministers of the Republic of Uzbekistan "On measures for the organization of international studies in the field of education quality assessment in the public education system" dated December 8, 2018 No. 997 The National Center for International Research was established. At the same time, the tasks of

participation in international studies on the assessment of the quality of education were defined[1]:

PIRLS - assessment of reading and comprehension level of primary 4th graders;

TIMSS - assessment of literacy of 4th and 8th grade students in natural and scientific subjects;

TALIS is a study of the environment of teaching and learning in general secondary educational institutions and the working conditions of teachers[2];

PISA is an assessment of the literacy level of 15-year-old students in reading, mathematics and natural sciences. These projects serve to assess students' creative and critical thinking skills, ability to apply acquired knowledge in life through various assignments, and further stimulate the development of these skills[3].

Entering its third decade of data collection and seventh cycle, TIMSS (Trends in International Mathematics and Science Study) is a widely used international assessment program for math and science in grades four through eight. The first assessment within the framework of the TIMSS study was conducted in 1995 and repeated every four years: 1999,

2003, 2007, 2011, 2015, 2019. The TIMSS 2019 study is the last in the series of TIMSS studies[4].

About 60 countries use TIMSS trend data to monitor the effectiveness of their education system in a global context, and new countries are added to the TIMSS study every period. The TIMSS survey of math and science assessments is a valuable resource for monitoring educational effectiveness because science, technology, engineering, and math, commonly known as STEM, are core curriculum areas. Obviously, even today, many jobs require a basic understanding of mathematics and natural sciences, and this will not lose its relevance in the future.

Those working in STEM professions are responsible for finding solutions to world problems such as fighting hunger and habitat loss, as well as supporting growth and stability in the global economy. Also, mathematics and natural sciences are the basis of everyday life. Natural sciences are nature, including our weather, land and water, food and fuel sources.

Mathematics helps us perform everyday tasks and is essential in the creation of the technologies we rely on, such as computers, smartphones, and televisions. In this regard, the training of primary school teachers based on the TIMSS international assessment program and the development of their methodical training is one of the urgent problems of today. At the same time, the preparation of primary school teachers for the TIMSS international assessment program is an important event. If:

- If the preparation of primary school teachers for the TIMSS international assessment program is effectively organized;
- If the methods and means of preparing primary school teachers for the TIMSS international assessment program are activated;
- If the teacher works creatively in the educational process, real life examples and logical concepts are used appropriately in mathematics and natural science lessons, the students' learning and activity will be effective.

The global resource for determining the level of knowledge, skills, and qualifications

of students from more than 60 countries was developed based on the world's most advanced experience. With the help of TIMSS, the educational achievements of students are evaluated: knowledge, application, reasoning. At this point, teachers will need to know the cognitive areas of the TIMSS international assessment program. We will touch on them below:

The "Knowing" section includes problem solving in mathematics, and problem solving requires students to acquire theoretical knowledge about the properties of numbers and simple geometric figures, to repeat definitions, and to obtain information from standard graphs and diagrams. includes z. Pupils should demonstrate the level of knowledge about the properties of organisms and objects, events and processes, natural-scientific terms and units of measurement from natural sciences.

When completing the test tasks related to "Application", students need to demonstrate the ability to solve mathematical and natural-scientific problems that reflect life situations, interpret tables, schemes, diagrams, graphs, and conduct experiments.

Tasks related to "reasoning" determine students' logical and systematic thinking skills. The issues that require reflection can be distinguished from each other by the novelty of the proposed situation, the complexity of the question, the large number of solution steps, the need to integrate knowledge from different departments. The TIMSS & PIRLS Center for International Studies technical report on the methods and procedures used to develop, implement, and report results for TIMSS 2019 (Michael O. Martin, Mathias von Davier, and Ina W.S. Mullis) describes the initial transition to TIMSS 2019. because there were various technical difficulties.

According to eTIMSS, about half of the countries administer the assessment via computer, while the rest use a paper-and-pencil format. Thus, TIMSS 2019 assessments and questionnaires have been developed and administered in e- and paper formats. Subsequently, a multivariate approach to achievement scaling allowed us to report

comparable trends for both sets of countries on the TIMSS scale. The success of TIMSS 2019 is a credit to all participants, including the TIMSS & PIRLS International Research Centre, IEA Amsterdam, IEA Hamburg, Statistics Canada, and the National Research Coordinators and their teams in the participating countries. In 2023, the IEA and TIMSS & PIRLS International Learning Center will conduct the eighth cycle of TIMSS (Trends in International Mathematics and Science Learning) in grades four and eight, providing nearly 30 years of trend data on student achievement in mathematics and science.

TIMSS 2023 completes the transition of TIMSS to digital assessment that began with TIMSS 2019, reflecting the widespread use of technology in schools and society. TIMSS 2023 assessments include new and engaging item formats, interactive features, and scripted problem solving and inquiry tasks that engage learners and utilize the digital environment. Also, in the TIMSS study, students, their parents or guardians, teachers, and school principals are asked to fill out questionnaires about their activities at home and at school, as well as the conditions for learning mathematics and natural sciences. Questionnaires are constructed according to a carefully developed scope, which is updated at each assessment through iterative reviews by TIMSS National Research Coordinators and international experts from the TIMSS Questionnaire Review Committee. Data from these surveys provide insight into the implementation of educational policies and practices that can suggest ways to improve education and raise important issues. TIMSS research focuses on the systematic assessment of learning dynamics, issues that arise in content areas and contexts for learning, and effective methods and activities that are important for educational decision-making in participating countries.

In conjunction with the TIMSS learning data, contextual questionnaire scales can be used to:

- monitoring the system-level development dynamics in a global context;

- Using the results of TIMSS studies to inform education policy makers and monitor the effectiveness of new or revised policies;

- Identify any underperforming areas and encourage curriculum reform;

- to observe how the fourth grade cohort of the previous term performs in the eighth grade in the next term;

- obtaining important information about students' mastery of mathematics and natural sciences depending on the conditions of education and training at home and school.

To sum up, by participating in TIMSS and other international studies, Uzbekistan will have the opportunity to apply the experiences of developed countries in the educational system of Uzbekistan and compare its results with the results of other countries. In this place, the place of future primary school teachers is great. By developing methodological preparation of future primary school teachers for international assessment programs, we will prepare our future successors for the TIMSS international assessment program. As a result, our students show good results in international studies.

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