

**RESEARCH ARTICLE**

# Issues in Improving the Professional-Methodological Preparation of Primary School Teachers Based on Timss International Assessment Criteria

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**VOLUME:** Vol.06 Issue04 2026

**PAGE:** 226-228

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## Abstract

The article analyzes the professional preparedness, methodical needs, and pedagogical challenges of primary school teachers in Uzbekistan concerning international assessment programs, specifically TIMSS (Trends in International Mathematics and Science Study). The research findings underscore the critical importance of organizing professional development courses, practical seminars, and interactive training sessions based on TIMSS competencies to enhance the quality of education among primary school educators. In conclusion, the study highlights that integrating international standards into the national educational framework is essential for fostering teachers' professional growth and ensuring that pedagogical practices align with global excellence in mathematics and science education.

## KEYWORDS

TIMSS, international assessment programs, primary education teachers, methodical preparedness, methodical competence, professional development, quality of education.

## INTRODUCTION

In today's global education system, the focus has shifted from mere instruction to evaluating outcomes based on international standards. Particularly in assessing the performance of primary school teachers, the emphasis is placed not only on their level of knowledge but also on their modern approaches to student engagement. This process requires educators to go beyond traditional methods and organize every lesson systematically and clearly, in alignment with international quality requirements. In this regard, preparing future teachers based on the criteria of international studies such as TIMSS elevates the quality of education to a new level. Currently, to enhance the methodical skills of pedagogues, abstract theory is being replaced by the active integration of innovative methods and interactive solutions into practice.

## METHODOLOGY

In 2025, a monitoring-survey study was conducted across the Khorezm, Fergana, and Bukhara regions, as well as the city of Tashkent, to diagnose the methodical competence of primary education teachers within the framework of the TIMSS (Trends in International Mathematics and Science Study) international assessment program and to identify the pedagogical and organizational characteristics of the educational processes in these areas. A total of 4,053 participants took part in the study, with the distribution as follows: 16.3% from the Khorezm region, 34.5% from the Fergana region, 15.8% from the Bukhara region, and 33.4% from the city of Tashkent.

## DISCUSSION

The results obtained indicate a growing need among teachers to establish effective communication with students, create psychological comfort and a positive atmosphere during the lesson, and stimulate students' intrinsic motivation. In the current professional activities of primary education teachers, the greatest demand lies in pedagogical technologies, accounting for 44.8%. This underscores the necessity of effectively utilizing innovative technologies, digital tools, and interactive methods in the modern classroom. Current educational reforms require the deepening of teachers' knowledge and skills specifically in this direction. Psychological knowledge (25.9%) and pedagogical techniques (23%) rank second and third, respectively.

Although teaching methodology (18%) and professional knowledge (17%) account for relatively lower percentages, these areas remain integral components of a teacher's activity. These figures indicate that while teachers possess fundamental theoretical knowledge in these fields, there is a clear necessity to update and enrich this knowledge with modern requirements. The analysis reveals a high demand among educators for updating their technological, psychological, and methodical expertise. This situation underscores the need to prioritize areas such as digital pedagogy, interactive lesson organization, and learner-centered instruction within the educational process.

According to the research findings, nearly two-thirds of the teachers (73.7%) express a need to deepen their professional development and methodical preparedness within the framework of international assessment systems (TIMSS). This figure demonstrates the relevance of training teachers based on international standards within the Uzbek education system. Additionally, 17.7% of teachers consider themselves sufficiently prepared, which is attributed to their experience in previous training courses, conferences, or national assessment programs. Meanwhile, 8.7% of respondents indicated a need to update their methodical knowledge in specific areas. The results suggest that it is essential to organize professional development courses and conduct practical seminars based on TIMSS requirements. Furthermore, aligning textbook content with the international competency system and strengthening teachers' skills in diagnostic analysis and the development of problem-based tasks should be established as priority areas.

In the surveys conducted as part of the TIMSS international study among 4,053 respondents, the results of the question

“To what extent are you informed about TIMSS international studies?” revealed that 62.4% of respondents have only 'partial' information. This indicates that while the majority of teachers possess a general understanding of TIMSS, they lack comprehensive knowledge regarding its in-depth content, assessment methodology, cognitive domains (knowing, applying, reasoning), and the structure of test items. This situation demonstrates that educators are currently in the initial introductory stage of becoming familiar with international assessment systems.

In the study, 36.4% of respondents stated that they are fully informed about TIMSS international studies. This group primarily consists of teachers who have become familiar with the TIMSS concept, competency-based approach, and test structure through professional development courses or methodical seminars. These educators possess the capacity to integrate international assessment criteria into their classroom practice. Conversely, 1.2% of participants reported having no information about TIMSS at all. Although this figure appears small, it indicates the existence of certain regional, methodical, or informational gaps within the system.

While the general level of awareness regarding the TIMSS international assessment program among teachers in the Uzbekistan education system is sufficient, the number of educators lacking in-depth knowledge of its methodical foundations, testing systems, assessment criteria, and methods of classroom integration remains high. This result confirms that the success of implementing international assessment programs into the national education system is directly dependent on the level of a teacher's methodical preparedness. Therefore, updating teachers' knowledge of TIMSS and developing their practical competencies is of paramount importance today.

### CONCLUSION

Research findings indicate that the methodical needs of primary school teachers today are primarily centered on modern pedagogical technologies (44.8%) and psychological knowledge (25.9%). The fact that 73.7% of respondents express a significant need for professional development within the framework of the TIMSS international assessment program confirms that transitioning to international standards is a contemporary necessity for enhancing educational quality. Although the majority of teachers (62.4%) possess a general understanding of the TIMSS program, there remains a high

demand for the deep integration of knowledge regarding assessment methodology and cognitive domains into their teaching practice.

In order to develop primary education teachers who meet the requirements of international assessment systems, it is essential to focus on the development of practical competencies rather than limiting training to theoretical information. Therefore, revising professional development courses based on TIMSS criteria, enriching textbook content with logical and problem-based tasks, and consistently enhancing educators' skills in digital pedagogy serve as priority directions for the advancement of the national education system.

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