

## COMPONENTS AND ANALYSIS OF TIMSS ASSIGNMENTS

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**ANNOTATION:** TIMSS (Trends in International Mathematics and Science Study) tasks are aimed at assessing students' knowledge and skills in mathematics and natural sciences at the international level. These assignments are designed to measure not only students' factual knowledge, but also their ability to analyze it, solve problems, and think creatively. This article aims to examine the components of TIMSS assignments, their structure, assessment indicators, and methods used in analyzing student learning outcomes. At the same time, the adaptation of assignments to national curricula and their impact on the educational process will also be considered.

**KEY WORDS:** TIMSS, international assessment program, math and science, task analysis, learning outcomes, teaching methodology, problem-solving skills, national curriculum.

### INTRODUCTION

Globally, the TIMSS international study is a leader in assessing students' scientific knowledge and thinking skills. The field of biology is an important foundation for environmental security, healthcare, and technological development at the global level. As demand for STEM education (science, technology, engineering, and mathematics) increases, TIMSS assignments serve as an effective tool for directing students' theoretical knowledge towards solving practical problems. Participation in TIMSS international rankings also determines the criteria for the quality of education of countries, which ensures the exchange of experience between countries and the introduction of advanced pedagogical methods.

The issue of using TIMSS assignments is very relevant for the strategic goals of educational reforms in our country and participation in international research. The state's policy aimed at improving the quality of education also includes the development of fundamental sciences such as biology. Paying special attention to the formation of practical and critical thinking in the curriculum of this subject requires not only increasing students' knowledge of the subject, but also their ability to use it in everyday life.

In the 21st century, the enrichment of educational content and the development of students' practical knowledge through international research is becoming increasingly important. TIMSS (Trends in International Mathematics and Science Study) is one such international assessment system. This study aims to determine the level of knowledge of schoolchildren in mathematics and natural sciences and to provide recommendations for improving the education system. Studying the structure of TIMSS assignments and integrating them into the continuous learning process is crucial for educating students as individuals with high knowledge and skills [1, 15 - 45-b].

TIMSS assignments include three main components:

#### **1. Content Domain:**

For the natural sciences, it covers the flora and fauna, human biology, ecology, energy, etc.

The content of knowledge is structured taking into account the intellectual abilities of different age groups.

#### **2. Cognitive Domain:**

**Knowledge:** The learner's ability to memorize facts and concepts and re-express them.

**Analysis:** Data assessment, identification of cause-and-effect relationships, and problem-solving.

**Practical application:** Developing skills in applying scientific knowledge in everyday life.

#### **3. Topic context (Context Domain):**

The proximity of the situations presented in the assignments to real life connects education with real-life problems.

By studying specific problems, students will be able to apply scientific methods in practice [2, 67-92-

b., 3, 132-149-b.].

TIMSS assignments can be used at all stages of continuous education, i.e., in primary, secondary and higher education systems.

These assignments are linked to the following aspects that encourage students to delve deeper into the subject:

**1. In primary education:** TIMSS assignments are adapted to teach students simple concepts about nature and arouse their interest. For example, simple experiments on plant growth conditions.

**2. In general secondary education:** in the 8th grade, TIMSS assignments are aimed at developing students' scientific and cognitive processes. At this stage, questions about environmental problems or the functions of the human body shape students' analytical skills.

**3. In higher education,** it is possible to teach the methodology of conducting research using TIMSS assignments. This is especially useful in explaining the TIMSS methodology to students in the field of pedagogy [4, 58-77 b.].

There are several ways to improve lesson effectiveness based on TIMSS assignments. These are:

**1. Application of problem-based learning technology:**

Create problem situations that encourage students to search for answers.

**2. The use of interactive methods:**

Personalize TIMSS tasks for teamwork. For example, discussing environmental issues in a group.

**3. Systematization of evaluation:**

Monitoring student development using TIMSS assignments in continuing education [5, 24-35-b.]. TIMSS test results are evaluated as follows:

The international average score (Scale Average): 500 points is accepted as an international standard.

2. Dividing the results into four levels:

High level: over 625 points.

Average level: 475-625 points.

Low level: range of 400-475 points.

Minimum level: less than 400 points.

Continuous monitoring and development of the quality of education is one of the main requirements of today's era of globalization. For this purpose, the results of international assessment programs, particularly TIMSS (Trends in International Mathematics and Science Study), are of great importance. This program allows for the analysis of students' knowledge, skills, and thinking abilities in mathematics and natural sciences. An in-depth analysis of TIMSS results will help not only identify student performance indicators, but also assess the strengths and weaknesses of the national education system.

The main goal of this task is to study how the data obtained during the analysis of TIMSS results can be used to monitor the quality of education. At the same time, this approach involves developing recommendations for improving the education system based on national and international experience.

TIMSS results are used to improve the quality of education through the development of the education system, deepening students' knowledge and international comparison. Here are the different ways in which these results can be used:

1. Development of educational programs - TIMSS results help to assess the effectiveness of educational programs.

2. Teacher Training - TIMSS results also allow for an analysis of how teachers conduct the learning process.

3. Identifying students' abilities - helps develop students' knowledge and skills using TIMSS.

4. The study of international experience - the results of TIMSS - allows for an analysis of the role and level of development of the education system at the international level.

5. Monitoring the quality of education - TIMSS results serve to continuously assess the quality of education.

**Conclusion.** TIMSS assignments are not only an international assessment tool, but also an important

pedagogical resource for developing students' skills in analyzing, critical thinking, and applying knowledge in practice. By improving the methodology of applying TIMSS tasks in the process of continuous education, it is possible to enrich the content of education and shape the scientific worldview of students. This, in turn, is of great importance in raising the national education system to the level of international requirements.

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