

# IMPROVING SCIENCE LITERACY IN PISA STUDIES

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## Abstract

This article highlights ways to improve science literacy in PISA studies.

**Keywords.** Pisa, literacy, natural, action strategy.

## Introduction

The main goal of the fundamental reforms in the field of education implemented in our republic is the formation and development of students' literacy skills.

At a time when our country is rapidly developing on the path of innovative development, it is important to form young people, who are the successors of our future, their knowledge and skills based on foreign educational standards, and to improve the evaluation system based on modern clear criteria and requirements.

According to the Decree of the President of the Republic of Uzbekistan No. PF-4947 of February 7, 2017 "On the Action Strategy for the Further Development of the Republic of Uzbekistan", "Five priorities for the development of the Republic of Uzbekistan in 2017-2021 "Strategy of Actions on the issue" was adopted.

4.4 of priority areas of social sphere development. One of the clauses for the development of the field of education and science is "fundamental improvement of the quality of general secondary education, in-depth study of foreign languages, computer science and other important and high-demand subjects such as mathematics, physics, chemistry, biology" and it corresponds to the world's best practices in the field of education.

Study of international experiences in the assessment of the quality of education, comparative and comprehensive analysis of the existing system, close cooperation with relevant international and foreign organizations, agencies, research institutions, assessment of the quality of education It is important to implement international projects and improve a suitable national evaluation system that meets the requirements of the time.

Assessment of students' knowledge level in paragraph 5 of the Decree of the President of the Republic of Uzbekistan dated September 5, 2018 "On additional measures to improve the public education management system" No. PF-5538 participation of students of general education institutions in international programs and research (PISA, TIMSS, PIRLS, etc.)



- Progress in International Reading and Literacy Study (PIRLS) — to assess the reading and comprehension level of primary 4th graders;
- Trends in International Mathematics and Science Study (TIMSS) — to assess the mastery level of 4th and 8th grade students in mathematics and natural sciences;
- The Program for International Student Assessment (PISA) — to assess the level of literacy of 15-year-old students in reading, mathematics and natural sciences;
- The Teaching and Learning International Survey (TALIS) - to study the teaching and learning environment of the leaders and pedagogues in general secondary educational institutions and the working conditions of teachers;

On April 5, 2019, the concept of developing the public education system of the Republic of Uzbekistan until 2030 was adopted.

The concept stipulates that by 2030, the Republic of Uzbekistan will enter the ranks of the first 30 advanced countries of the world according to the PISA (The Program for International Student Assessment) rating of the international student assessment program.

According to the decision of the Cabinet of Ministers of the Republic of Uzbekistan No. 997 of December 8, 2018 "On measures to organize international studies in the field of education quality assessment in the public education system", education in the public education system organization of international studies in the field of quality assessment, establishment of international relations, scientific research and innovation activities of students and young people, First of all, in order to comprehensively support and encourage the creative ideas and creativity of the young generation, the implementation of international studies on the assessment of the quality of education by the State Inspectorate of Education Quality Control under the Cabinet of Ministers of the Republic of Uzbekistan. center was established. In turn, the National Center for the Implementation of International Research on the Evaluation of the Quality of Education will conduct scientific research aimed at the development and implementation of innovative methods of developing the level of literacy in reading, mathematics and natural sciences in the educational system, Establishing international relations, developing and implementing international projects and other tasks in the field of education quality assessment. It was determined that the director of the national center will participate as a representative of the Republic of Uzbekistan in the organization and coordination of international research and will be considered the national project manager of international research.

As a practical expression of these tasks, the State Inspectorate of Education Quality Control under the Cabinet of Ministers of the Republic of Uzbekistan and the International Cooperation and Development Organization signed the Agreement for participation program for international student assessment PISA 2021 ) an agreement on participation was reached.

PISA (Programme for International Student Assessment) is an international research program for assessing student literacy, and the main goal of the program is for fifteen-year-old students to improve their reading, (text comprehension), mathematics, and natural sciences. is to evaluate literacy levels and creative thinking skills in the form of various tests. These projects encourage students to evaluate their creative and critical thinking, their ability to apply their knowledge in life, and then develop these skills. The PISA program, which is carried out every



three years, provides countries with timely information about the achievements and shortcomings of the education system, provides an opportunity to analyze the impact of relevant programs, and supports decision-making in the field of education policy. Since international studies such as PISA aimed at evaluating the quality of education are being conducted for the first time for the educational system of Uzbekistan, their correct, effective and objective conduct is of great importance.

Ensuring the successful participation of general secondary education institutions in international research; Comparative comparison of the results recorded by the Republic of Uzbekistan in international evaluation programs with the results of other countries; to carry out systematic monitoring of the introduction of international assessment programs into the educational process, popularize the best experience in this field and participate in the development of recommendations and manuals for educational institutions based on it; The main tasks and directions of activity of the National Center, such as the preparation of educational and methodological recommendations for improving the qualifications of pedagogic personnel in reading, mathematics and natural sciences using innovative methods of teaching, were determined.

PISA is an international assessment program aimed at assessing the level of knowledge of students in reading (reading), mathematics and natural sciences, and is designed to determine the knowledge and skills that students have acquired during school.

The PISA international assessment program also collects valuable information about student attitudes and motivation, and assesses students' skills such as problem solving. For example, in solving issues of global importance, the student evaluates the attitudes of young people and their suggestions and solutions. PISA focuses on students' ability to apply knowledge and skills, think and communicate, based on conducting international assessment programs within the framework of the requirements existing in the curricula of the countries of the world.

PISA does not prescribe or promote any curriculum or demand universal recognition. According to the experts and economists of the participating countries, they recognize that the formation and strengthening of students' acquired knowledge and skills in natural sciences are considered important first steps for the future success of the countries.

PISA research (Programme for International Student Assessment) is a program implemented by the Organization for Economic Co-operation and Development (OECD - Organization for Economic Co-operation and Development).

The research was conducted for the first time in 2000 and is conducted every three years. The next research is planned to be conducted in 2022.

The PISA study has the following characteristics:

- it is considered one of the largest, large-scale international monitoring studies in the field of education;
- 15-year-old students studying in general secondary educational institutions participate in the research;
- the research assesses the level of "readiness for life" of students, that is, to what extent they can use the knowledge and skills acquired at school to solve problems they may encounter in life;



- the study evaluates students' functional literacy in mathematics, reading (reading), natural sciences, and solving global problems;
- contextual information is collected that allows to obtain information on the uniqueness of the educational system of the countries participating in the research.
- Uzbekistan's participation in the PISA study makes it possible to:
- To determine to what extent the graduates of Uzbekistan's general education schools are ready to continue their education;
- to determine directions for improving general secondary education in the country;
- obtaining comparative information about educational achievements of students, as well as educational systems of different countries.

Why are PISA studies conducted every three years and why are only 15-year-old students tested?

The main task of PISA is to provide countries with information on education policy and to support them in making decisions. Conducting the survey every three years allows countries to provide timely information, including information and analysis to inform policy decisions and the impact of related programs. If the periodicity of conducting research is carried out in a short period of time, it creates the problem of not being able to collect the necessary data and enough time for changes and updates. The main reason for conducting research among 15-year-old students is that this age is the final period of compulsory education in most of the member states of the Organization for Economic Cooperation and Development (OECD).

The PISA international assessment program has its own importance as a comprehensive and regular program around the world.

More than 80 countries participated in PISA international assessment program. Conducting the research once every three years allows countries to determine the main goals to be achieved in the future in their educational systems. Also, the program is the only international assessment project for assessing the knowledge and skills of 15-year-old students.

Literacy: Rather than examining the superiority of specific school curricula, PISA looks at students' ability to apply knowledge and skills to key subjects, to analyze, interpret and solve problems effectively, to think and to communicate. the rib comes out. Lifelong learning: Students cannot learn everything they are supposed to learn in school. To be an effective learner, one must be aware not only of knowledge and skills, but also how and why they are learned. In addition to improving student literacy in reading (reading comprehension), math, and science, PISA asks students about their interest in learning, self-reports, and learning strategies. The PISA study diagnoses the readiness of young people for the life of "adults", which distinguishes it from other international studies, whose main goal is to measure the subject knowledge and skills defined in the curricula, which are largely unrelated to real life or educational tasks. is to try using

It is of particular interest to determine the state of knowledge and skills that may be useful for children in the future, as well as the ability to independently acquire knowledge necessary for successful adaptation in the modern world.

PISA studies are conducted in three directions: reading literacy, mathematical literacy, natural science literacy, evaluated in a 1000-point system. Research is conducted in a three-year cycle.





In each cycle, the main attention is paid to one of the three directions mentioned above. Changes in the education system of the countries in a certain direction are analyzed in detail. This international program was developed in 1997 and was put into practice for the first time in 2000. With the help of the program, changes in the education system of different countries are identified, compared, and evaluated. The results of these studies are followed with great interest around the world. Therefore, its importance and scope is increasing year by year. For example, in 2000, 265,000 students from 32 countries took part in the program tests, and in 2018, this indicator was expected to double, that is, more than 540,000 students from 78 countries would participate.

PISA tasks are completed on a computer. The test questions have ready answers, and the correct one is selected from them. There will also be unanswered tests. The student is asked to answer them fully or briefly. Some test tasks are related to the same life situation, but consist of test questions of different difficulty levels. Tests are made in several options. Some tests may be repeated in some variants. Also, in the study, students write information about themselves and their school principals in a questionnaire. The collected information helps to determine the factors affecting the educational outcome.

The results of PISA studies allow to determine the following:

- Quantitative indicators representing the basic knowledge and skills of 15-year-old students;
- quantitative indicators representing the state of factors affecting the educational results of students and the implementation of work at school;
- quantitative indicators representing the direction of changes in the results achieved over time.

Research results and indicators describing the education system of different countries are published every three years. These data are used to compare the achievements of the educational system of the countries and to determine the policy in the field of school education. The program is implemented by a Consortium that includes leading international research organizations and national centers, the Organization for Economic Cooperation and Development. The work of the consortium is managed by the Australian Council for Educational Research (ACER).

Pupils are mainly offered not academic, but practical situations typical of everyday life (medicine, housing, sports, etc.). In most cases, students are required to use not only different topics and sections of mathematics, but also knowledge and skills acquired in other subjects, for example, physics and biology. What is the importance of international assessment programs?

As a result of the reforms carried out in our country in recent years, huge economic growth indicators are being achieved, increasing the demand for qualified personnel and advanced specialists in all fields. This in itself requires increasing the interest of our students in lessons and increasing the attention of teachers to all-round education. The fact that the above requirements are very important for the educational system means that, as in most foreign countries, it is necessary to attract the best practices aimed at improving the quality of education by evaluating and monitoring the development of educational and scientific fields.



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2. AA Ismailov and others. Newsletters designed to prepare students for international studies (a newsletter intended for teachers of mathematics, natural sciences, native language and literature, methodologists and specialists in these fields). National Center for the Implementation of International Research on the Evaluation of the Quality of Education under the Inspectorate of Education. - Tashkent, 2020
3. AB Radjiev et al. International Research Program on Student Literacy Assessment. Manual. Tashkent, National Center for Implementation of International Research on Educational Quality Assessment -2019.

**Internet Resources:**

1. [http:// www.markaz.tdi.uz](http://www.markaz.tdi.uz) - the website of the National Center for the Implementation of International Research on the Evaluation of the Quality of Education
2. @milliymarkaz\_aloqabot – Telegram bot of the National Center for International Research on Educational Quality Assessment.
3. <https://uza.uz/uz/hosts/ta`lim-baholash-mohiyatiga-nazar>.
4. <http://markaz.tdi.uz>
5. [www.oecd.org](http://www.oecd.org)
6. [www.centeroko.ru](http://www.centeroko.ru)
7. [http:// www.rtm.uz](http://www.rtm.uz) – the site of the Republican Education Center.