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EFFECTIVENESS IN DEVELOPING STUDENTS' SCIENTIFIC LITERACY BASED ON PISA INTERNATIONAL RESEARCH AND ITS USE

Qaraxonova Lobarxon Musaxonovna
senior researcher, (PhD), head of the department at Scientific research institute of pedagogical sciences of Uzbekistan named after T.N. Kari Niyazi

Karimova Iroda Radjabovna
Master's student at the Uzbek-Finnish Pedagogical Institute, Uzbekistan

ABOUT ARTICLE

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Abstract: Today, in the developed countries of the world, the methodology and technologies of the monitoring process and international research are being improved in order to make a comparative comparison of the results of the educational process, to regularly analyze the dynamics of the development of students' knowledge and the quality of education. One such international study, Pisa, is one of the most important educational programs in preparing students for international assessment programs. This article discusses the PISA international assessment program and the effectiveness of its use.

INTRODUCTION

PISA (Program for International Student Assessment) is an international program that assesses the literacy and competence of 15-year-old students and is conducted by the Organization for International Economic Cooperation and Development every three years.

In PISA studies, students' knowledge of individual subjects is not checked, but the state of knowledge and skills needed in life is studied, as well as students' interdisciplinary competence is assessed. 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. Each cycle

focuses on one of the three areas mentioned above. Changes in the education system of the countries in a certain direction are analyzed in detail.

Reading literacy	Mathematical literacy	Literacy in natural sciences
2000	2003	2006
2009	2012	2015
2018	2021	2024 and others.

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 figure was expected to double, that is, more than 540,000 students from 78 countries took part.

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).

The term "reading literacy" refers to "literate reading," not a test of reading speed. According to him, it is necessary for the student to understand mants, to be able to observe and evaluate their content, and to be able to express his opinion. Students are presented with various texts: excerpts from works of art, biographies, personal letters, documents, articles in newspapers and magazines, instructions, advertisements, geographical maps, etc. They display information in various forms: diagram, picture, map, table, drawing, etc.

With the help of "Mathematical Literacy" tasks, the knowledge acquired by students in the school mathematics course is not checked, but the main attention is paid to their ability to apply mathematical knowledge and skills in different situations. Pupils are mainly offered practical situations typical of everyday life (medicine, housing, sports, etc.) rather than academic ones. 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.

The research direction "Literacy in natural sciences" comprehensively examines the knowledge and skills acquired by students in the sciences of physics, biology, chemistry, and geography. The life situations offered to the students are related to actual problems faced by each person in his personal life (for example, the products consumed during the diet), as a member of a team or society (for example, determining the location of a power plant in relation to the city). or as a global citizen (for example, understanding the consequences of the "greenhouse effect").

It should be said that the education of our country has not been included in the PISA evaluation system until now. But efforts have been made in this regard. This is confirmed by the fact that our country's education has been approved for participation in the PISA 2021 international assessment program and the opening of the "National Center for the Implementation of International Studies". This center is responsible for adapting the education system of our country to international standards, systematically conducting tests aimed at evaluating the formation of practical skills in the period of 2019-2021, modernizing educational literature, training based on international educational standards a number of

tasks, such as making changes and additions to the content of state educational standards, educational programs and educational literature in winter, mathematics, and natural sciences.

To prepare for participation in international studies on international assessment programs, it is necessary to study and analyze the content of questions used in previous years and use them in the educational process.

An example. Assignment Group "Mary Montague"

Read this material and answer the questions

Mary Montague was a very beautiful woman. He contracted chicken pox in 1715 and his entire body was covered in red rashes. In 1717, while living in Turkey, he observed the widely used vaccination method. Elash was carried out in a simple way in which healthy young people were injected with weakened real chicken pox virus by scratching their skin, after which they contracted chicken pox, but the disease was mild.

Mary Montague was so convinced that vaccination was safe that she allowed herself to vaccinate her son and daughter.

In 1796, Edward Jenner studied that by inoculating cattle with chicken pox, a close relative of chicken pox, the organism produced antibodies against real chicken pox. People vaccinated with this method did not get chickenpox a second time. This incident was later treated as vaccination.

Question. What types of diseases can a person be vaccinated against?

A) against hereditary diseases similar to hemophilia

C) against diseases caused by viruses similar to poliomyelitis

C) metabolic diseases, diabetes-like diseases

D) any diseases for which there are no drugs for treatment.

Question type, by choosing short answers

Competence: scientific justification of processes.

Content: natural-scientific

Field of application: health.

Context: social.

Difficulty level: 2

Question. Why is it important to get the flu vaccine for young and old? Give one of its reasons.

Assignment evaluation:

The answer is fully accepted:

The answer takes into account the fact that children and young adults have a relatively weaker immune system than other people. Or other reasons.

• These people have relatively low resistance to disease

• Young and old people are less susceptible to diseases than other people.

• They are more susceptible to influenza than others

• If these people get the flu, treatment will take longer

• The body of young children and adults is weak

• Older people get sick more often.

Question type: the answer is free-form

Competence: scientific justification of processes.

Content: related to natural sciences.

Field of application: health

Context: social.

Level of difficulty: level 3

Example: Task "Exercise"

Regular and systematic exercise is necessary for our health

Question. What are the benefits of regular exercise?

Confirm your answer by ticking "Yes" or "No".

Is systematic exercise beneficial?	Yes or no
Physical exercise is useful in preventing cardiovascular diseases	Yes/No
Exercise leads to a healthy diet	Yes/No
Physical exercises help to lose excess weight	Yes/No

Question type: Expressing the answer through Yes/No

Competence: Scientific justification of processes

Content: natural and scientific

Field of application: Health

Context: Personal

Level of difficulty: level 1.

Participation in PISA studies allows to understand the main aspects of the development of general secondary education in Uzbekistan. The results of the PISA-2015 international assessment provide valuable information about the level of development of science, mathematics and reading skills of 15-year-old students.

The theoretical results of the conducted research show that it is necessary to use international assessment assignments in modern schools. It clarifies the modernization of general educational processes in a modern school, ensures the transition to a new educational system and increases the cognitive activity of students, increases the readiness of students for self-development, the educational process it became known that it is necessary to design the activities of the educational process in general education schools, taking into account the age, psychological and personal characteristics of students.

The analysis of pedagogical research shows that the implementation of international assessment programs in the education system requires new approaches to the organization of education. The use of international evaluation programs increases interest in subjects other than biology taught in secondary schools, as well as innovative technologies in education, and always requires the implementation of interdisciplinary connections. As a result, students' logical thinking, creativity, research activities, cognitive activity are activated, data, processes, various information are

independently analyzed and defended in their own opinion, and the ability to advance and generalize new ideas is formed.

Modern approaches to the educational process impose requirements aimed at mastering result-based education. For this reason, it is necessary to use the experiences gained as a result of international research. To determine the purpose and specific aspects of public evaluation research, the difficulties that arise in the performance of related tasks, and to teach students to overcome these difficulties, attention should be paid to the following:

- it is necessary to pay attention to which fields of science the difficulties in these tasks belong to:
- these tasks require additional information (using different tasks, deviating from the texts) and also knowing the "unnecessary" and "redundant" information in the task:
- using 'Know', 'Reflect' and 'Apply' to find solutions to information that students find challenging:
- requiring imagination about multiple-choice answers when completing these unusual tasks:
- recognize that this is a complex and design-intensive task involving several interrelated questions:
- these are diverse topics containing a large amount of information and have different formats, requiring different options for answers (selecting an answer, writing words or numbers, writing short or extended answers), some Tasks are of the design type and must be completed within a certain time limit:
- to connect these tasks with the processes in his life, to be able to apply his knowledge and skills in unusual situations in his life:
- this task requires formulating the answers in the form of tables, diagrams, graphs:
- these assignments require interdisciplinary connections.

The given international assessment tasks and methodical instructions for their implementation will be useful for students to prepare for participation in international assessment programs PISA, TIMSS.

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