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USING PISA TASKS TO IMPROVE STUDENTS' MATHEMATICAL LITERACY

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Abstract: This article provides insights into the requirements for improving students' mathematical literacy through the PISA study and the use of the "Case-study" method.

Key words: PISA study, mathematical literacy, requirements, arithmetic skills, digital technology, "Case-study" method.

Particular attention is paid to the fundamental reform of the education system in our country, to the acquisition of modern knowledge and skills at the level of world standards, to the development of physically and intellectually mature people, to the development of their abilities and talents, intellectual potential, to instill in the hearts of the young generation the feelings of loyalty and devotion to the country.

Each country has its own views on the concept of mathematical literacy or competence and organizes its educational process to achieve it as an expected outcome. It is known that mathematical literacy or competence is mainly the acquisition of arithmetical skills, in particular the ability to perform addition, subtraction, multiplication and division on whole numbers, simple and decimal fractions, calculating percentages, simple includes skills such as calculating the area and volume of geometric shapes. The introduction of digital technologies into our lives is the emergence of opportunities for people to obtain the necessary information from the flow of information to meet their personal needs, in areas of life related to health and investments, weather and climate changes, taxation, the public debt, population growth, the spread of infectious disease epidemics, and the global economy have also created a need for skills related to solving social problems.

Such daily changes of the life needs of the 21st century, in turn, require the expansion and improvement of the concept of mathematical literacy.

Mathematical literacy of a person is the ability to interpret and apply mathematics in various situations encountered in life (construction, trade, medicine, travel, etc.), realizing the importance of mathematics. According to the PISA research requirements, the following requirements are set for students' mathematical literacy:

- identifying the surrounding problems;

- expressing these problems in mathematical language;

- solving these problems by applying mathematical facts and methods;

- analysis of used methods;

- explanation and interpretation of the obtained results taking into account the given problem;

- formulating results, solutions, expressing and recording them.

As mentioned above, PISA tasks are taken from real life and given in the form of case studies. One answer tests with questions (up to 1-6) assigned to the assignment; multiple choice tests; presented as short or detailed answer questions or a student's idea of a solution to a problem (student creativity is encouraged). Each question is divided into 3 categories: content area related to mathematics, competence, area of application (context).

Assignments presented within the framework of the PISA assessment program are based on life situations, i.e. cases. This requires the wide application of Case technology in the learning and education process.

Case-stadi" (inc. "case" - a collection, from chemo (suitcase), "study" - I study a problematic situation) - situational analysis or analysis of problematic situations. This method serves to form students' skills to find the most optimal options by analyzing a concrete, real or artificially created problem situation. It teaches students to directly study and analyze any meaningful situation. The "case study" method was first used in 1870 at Harvard University Law School (USA), and in 1920 at Harvard Business School. Harvard Business School faculty are quick to realize that there are no adequate textbooks for a graduate business department. To solve this problem, the first step taken by the teachers of the business school was to interview leading business practitioners and write a detailed report on the activities of these managers and the factors affecting it. The lecture was presented to the audience in the form of finding a solution based on the real situation faced by this or that organization, analyzing this situation and organizing a discussion independently or as a team. In 1924, the first collection of cases was created in the USA. Currently, this method is widely used in developed countries in all fields of education, economy and business.

Circumstances considered when applying the case-study method:

- preparation of the case assignment in written form;

- ensuring independent study and discussion of the case assignment by students;

- achieving a mutual discussion of the case in the classroom under the leadership of the pedagogue;

- in the process of finding a case solution, following the principle of "the discussion is more important than the solution";

- development of various educational projects;

- to encourage students' educational activities and ensure their success.

Formed in students during working with cases

competencies:

• practical;

• analysis;

• assessment of the situation;

• creative approach;

• to communicate;

• critical approach;

• search;

• working with information;

• self-analysis and development;

• understanding of social, economic, political relations and active participation in them.

Steps of applying the case-study method:

1. Individual acquaintance with the case.

2. To isolate and study the main problem (specific problem) individually or in small groups.

3. Collect ideas in small groups and search for a solution to the problem.

4. Under the guidance of the teacher, organize the presentation of the proposed ideas for the solution of the case in small groups, analyze and evaluate the ideas.

5. Discussion and evaluation of case solutions and recommendations in small groups or individually under the guidance of the teacher.

Requirements for educational cases:

• clearly expressing the purpose;

• being able to cover several aspects of social, economic, cultural life;

• be effective;

• able to demonstrate national characteristics;

• represent similar situations related to business, culture, education or other fields;

• be relevant for today;

• development of students' analytical thinking;

• the ability to organize a debate;

• to have several solutions (decisions).

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