THE IMPORTANCE OF PROBLEM-BASED LEARNING IN DEVELOPING STUDENTS' LOGICAL THINKING SKILLS

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Abstract: *This article analyzes the importance of problem-based learning methods in developing students' logical thinking. The achievements achieved in organizing lessons based on problem situations and their importance in increasing student activity are studied. By using problem-based learning methods in the educational process, students' independent thinking, analysis and conclusion skills are developed, and the effectiveness of the lesson increases.*

In addition, the scientific views of such scientists as J. Dewey, MI Makhmutov, I. Ya. Lerner, MN Skatkin, O'. Tolipov and M. Usmonboyeva were studied and the theoretical foundations of problem-based learning were illuminated based on their theories. Through these theories, the theoretical foundations of developing students' logical thinking skills were studied.

Keywords: *logical thinking, problem situation, independent thinking, independent learning, reflexive thinking, competence, analysis, conclusion, pedagogical technology.*

Login

Nowadays, science and technology are developing very rapidly. The use of digital technologies in every field is becoming widespread, including in the field of education. The use of digital technologies provides a person with great

convenience and makes his work easier. AI systems with a wide variety of information help us find the information we need. However, most of the younger generation that is currently growing up is not only seeing the information in it as a model, but also absorbing it without thinking independently. The use of digital technologies in the education system is necessary to increase students' interest, further develop and improve their knowledge, and increase the efficiency of the educational process, but at the same time it should be used productively to develop students' independent and logical thinking.

Logical thinking is the ability of a person to consciously perceive, understand, analyze the environment, and draw conclusions based on all the information he has seen and learned. The formation of logical thinking is inextricably linked with human development. A person's thinking varies at different ages, that is, as a person grows, his thinking also expands and is enriched with different information at each stage.

Problem-based learning is one of the methods that encourages students to independently master knowledge rather than receiving ready-made knowledge. This greatly helps to activate the thinking process of learners. For this reason, there is an increasing need to use more innovative methods in educational processes than traditional methods.

Literature review and methods on the topic

Many scientists have conducted scientific research on the development of logical thinking. One of them is the American educator J. Dewey, one of the founders of the theory of problem-based learning. He emphasized the need to link the learning process with life problems, arguing that knowledge should not be given to students ready-made, but rather that they should learn it through independent research and study. According to J. Dewey's theory, reflective thinking in students can be formed through problem situations. [1]"Reflective

[1] Dewey J. Democracy and Education. - New York: Macmillan, 1916. - p. - 83-108

thinking" is the ability of a person to understand his own thinking process, analyze certain knowledge and consciously draw conclusions, as well as control it.

Even in modern pedagogical research, problem-based learning is considered one of the important factors that increase students' cognitive skills.

One of the pedagogical scientists who developed the theory of problem-based learning, MI Makhmutov, identifies the acquisition of knowledge by creating and solving problem situations in the learning process as the main characteristic of problem-based learning. He believed that problem-based learning forms the creative [2]and logical thinking of students.

I.Ya. Lerner and MN Skatkin also developed problem-based learning methods. In their theories, they showed that the role of problem tasks in the formation of students' cognitive activity is very important. [3]They noted that problem situations develop students' independent knowledge acquisition and learning skills.

Uzbek pedagogical scientists O. Tolipov and M. Usmonboyeva considered problem-based learning to be one of the most effective methods of pedagogical technologies and explained its great importance in shaping students' thinking.[4]

The scientific views of these scholars show that problem-based learning not only develops students' knowledge acquisition processes, but also improves their logical and creative thinking.

Problem-based learning and the importance of its application in the educational process

Problem-based learning aims to activate the thinking capacity of learners through specially organized problem situations in the educational process.

[2] Makhmutov MI Problem noye obucheniye. - Moscow: Pedagogy, 1975. - p. - 25 - 72
[3]Lerner I.Ya., Skatkin M.N. Teaching methods in modern schools. – Moscow: Prosveshchenie, 1982. – p. – 54-88
[4]Tolipov O'., Usmonboyeva M. Pedagogik texnologiyalar. – Toshkent: O'qituvchi, 2015.- p. – 67-102

A problem situation is a new, ambiguous, or contradictory situation for students that forces them to explore and learn in order to solve it.

To create a problem situation, processes such as understanding the problem, making a hypothesis , searching for a solution, and verifying the results and drawing conclusions are required.

Problem-based learning develops logical thinking through the following aspects:

1. Forms independent thinking

tries to find information and solutions on their own , rather than ready-made knowledge or answers . This activates their thinking.

2. Develops analytical thinking

of studying a situation and solving it, the student breaks down the information into pieces and analyzes each of them.

3. Helps to understand cause and effect relationships

The student learns to evaluate the outcome of each consideration in advance.

4. Forms a creative approach

Problem situations can have multiple solutions, which develops students' creative thinking.

Issue:

Will the sum of two natural numbers become larger if we square them, or will the sum of two natural numbers become larger if we square them separately and then add them?

This problem encourages the student to analyze the situation, make assumptions, build mathematical models , and draw conclusions. As a result, the student not only finds the answer, but also develops his thinking skills.

pedagogical observation, experimental-testing work, comparison and analysis, and questionnaires in the application of problem-based learning in the education system helps to assess its effectiveness.

Results and discussion

Theoretical analyses show that problem-based learning is an important didactic approach for developing students' logical thinking . In this approach, the educational process is focused on independent discovery of knowledge through problem situations, rather than learning ready-made knowledge.

According to John Dewey's research, by using problem-based learning in lessons to develop logical thinking, students become active discoverers rather than passive recipients of knowledge.

Based on Mikhail Mahmutov's theory, by using problem situations in education, students develop the ability to think independently as a result of analyzing, comparing, and drawing conclusions while solving a problem.

Isaac Lerner and Mikhail Skatkin also supports the idea that problem-based learning enhances cognitive performance. They believe that problem-based learning fosters creative thinking and independent thinking in students.

In general, the results of theoretical analysis show that problem-based learning:

- activates students' logical thinking skills;
- helps to deeply and firmly assimilate knowledge;
- forms reflective thinking;
- independent decision-making skills.

Conclusion

In the modern education system, the development of independent and logical thinking of students is an urgent problem and the main goal. By developing logical thinking skills, students can achieve excellence in their chosen profession. As a result, every field, every society and state will develop. Above, we examined the importance of using problem-based learning in the development of logical thinking using the example of mathematics. Problem-based learning can be used in all fields and disciplines, and this system shows its effectiveness.

Many pedagogical scientists have conducted scientific research on problem-based learning. We studied the theories of such scientists as J. Dewey, MI Makhmutov, I. Ya. Lerner, MN Skatkin, O. Tolipov and M. Usmanbayeva and analyzed them theoretically.

Problem-based learning is one of the methods that helps students develop as individuals and think independently.

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