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Problem-Based Learning Technology

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Abstract: Problem-based learning is one of the goals of a creative, active person. This article discusses about today's effective teaching technology – problem-based learning, its essence and an important aspect of organizing and conducting problem-based learning.

Keywords: teaching technology, problem-based learning, problem situation, learning problem, problem solving, mental activity.

Introduction

Effective teaching technology in high school today is problem-based learning. Its task is to stimulate the process of active learning and to form a research method in thinking. Problem-based learning is one of the goals of a creative, active person.

In the process of problem-based learning, the student's independence increases relative to the reproductive forms of learning. There are various definitions and descriptions of problem-based learning in the modern pedagogical literature. In our opinion, a relatively complete and accurate description is given by M.I.Makhmutova, in which the rules of application of teaching and learning methods, taking into account the measures of logical thinking (analysis, generalization) of problem-based learning and the laws of student research activities (problematic situation, curiosity, demand, etc.) is interpreted as a system [1,2].

The essence of problem-based learning is the teacher's management of students' learning activities in order to create a problem situation in their academic work and to acquire new knowledge by solving learning tasks, problems and questions. This creates a scientific way of learning [2,3,4].

It is known that any basis of teaching is based on certain laws of human activity, personal development and the principles and rules of pedagogical science formed on their basis. The process of human cognitive activity is based on objective laws and didactic principle - problem solving in the solution of logical cognitive contradictions.

Methodology

An analysis of the current teaching process shows that the conclusions of psychologists and educators that thinking begins with a problematic situation, unexpected surprises and delusions are close to the truth. In the context of learning, that mental, emotional, and emotional state of a person serves as a unique stimulus for him to think and think.

The problem situation arises in a specific teaching environment, which is purposefully organized in certain pedagogical tools. It is also necessary to develop specific ways to create such situations, based on the characteristics of the studied topics. Thus, a problem situation in teaching is not just a state of mental distress associated with an "unexpected obstacle in the way of thought."

It is a state of mental tension in which the goals of cognition are specifically required. At the heart of this situation are traces of previously acquired knowledge and ways of mental and practical action to solve a new problem. It is important to note that not all hardship is related to a problem. Mental distress is not a problem if the new knowledge is not linked to the previous knowledge. Such hardship does not guarantee mental research.

A problem situation is different from any thinking difficulty in that the student understands the internal, hidden connections between the object (concept, fact) that requires the difficulty, the task that is important to him first and foremost, and the problem [5,6].

Thus, the essence of a problem situation is that it is a contradiction between the information that the student is familiar with and the new facts and events (which lack previous knowledge to understand and explain them). This conflict is the driving force behind the creative acquisition of knowledge.

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Symptoms of a problematic situation include:
• the presence of a fact unknown to the student;
• instructions given to the student to complete the tasks, personal interest of the student in solving the learning difficulties.
Getting out of a difficult situation is always associated with understanding the problem, that is, what is unknown, its verbal expression, and its solution.
When it comes to analyzing a problem situation, it is primarily the students' independent mental activity. It leads the student to understand the causes of intellectual distress, to access it, to express the problem in words, that is, to define active thinking. Consistency is evident here: first a problem situation arises, then a learning problem.
In teaching practice, there is another option - the one in which the problem seems to correspond to the appearance of the problem. The expression of a problem in the form of facts, judgments, and contradictions in theoretical rules reflects the existence of a problematic situation, which is usually the answer to the question of "what".
The problem consists of three components: known (based on a given task), unknown (finding them leads to the formation of new knowledge) and previous knowledge (student experience). They are needed to search for the unknown. First, assigns a task to a learning problem that is unknown to the student, and in which the methods and outcomes of its implementation are also unknown, so that students can determine the expected outcome or solution based on their previous knowledge and skills [7,8,9].
Thus, a task that students know and how to solve it independently cannot be a learning problem, and secondly, it cannot be a learning problem even if they do not know how to solve a problem and how to search for it.
Significant symptoms of learning problems include:
• *leading to the formation of new knowledge*
• *the setting of the unknown;*
• *students have the specific knowledge base needed to carry out research in order to find the pot.*
An important part of a student's mental activity in solving a learning problem is to come up with a solution or hypothesis and substantiate the hypothesis.

The learning problem is constantly evolving with the help of problem questions, and each question serves as a step in its solution.
The components of the problem, the nature of the relationship between the known and the unknown, give rise to the need for knowledge and encourage active research.
It should be noted that a prerequisite for problem-based learning is to create in students a positive attitude to the process of searching for the truth and its results.
Students' creative and exploratory cognitive activity in problem-based learning consists of students expressing a problem in class when a problem situation arises, i.e., the nature of the difficulty in learning (i.e., what is known to them at the moment) expresses in words, then seeks ways to solve the problem and in doing so makes various assumptions, students base one of the assumptions found on the real dieb as a hypothesis and prove it. The search is completed after the problem or task is completed.
The research period of a person's cognitive activity can be expressed in special schemes: problem situation - learning problem - research to solve a learning problem - problem solving.

Results and discussion

An important aspect of organizing and conducting problem-based learning is that the teacher must have a good understanding of both its educational and pedagogical function. The teacher should not always give students a ready-made truth (solution), but should motivate them to acquire knowledge and help them to process the information, events, time, and happenings they need in their lessons and life activities.
Problem-based learning has a great potential for the conscious and solid acquisition of knowledge, the activation of students' cognitive activity in determining their active attitude to the environment.

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In problem-based learning, the teacher organizes the cognitive activity of students so that students independently solve intellectual problems based on the analysis of disciplines, draw conclusions and generalize, formulate laws and apply the acquired knowledge to new situations [10,11].
In some cases, the teacher should not only arouse students' interest, but also not to solve the learning problem on their own, and in other cases to guide students' independent work in solving the learning problem, resulting in students' ability to access knowledge independently and hypothesis finds new ways of mental action by proving put and develops the ability to transfer knowledge from one problem to another, develops attention and imagination. In the process of problem-based learning, students learn the methods of knowledge and mental action through the perception of learning materials in a problem situation, independently analyze what has been learned, formulate and solve learning problems by making hypotheses and proving them, this ensures the intellectual activity of students.

The problem of practical analysis of the learning process opens up the possibility of determining the specificity of teaching. The essence of problem-based learning is that the information that needs to be learned by the learner is specially organized by the teacher.
The first condition for the organization of problem-based learning is a system of improving educational information.
The second condition of problem-based learning is problem-based learning, in which information is given the opportunity to choose how to solve it as it is transferred to the learning task.
The third condition of problem-based learning is that the learner has a subjective position, understands their learning objectives and makes decisions, and is able to evaluate the means at their disposal to solve the problem and achieve the result.

Conclusion

Thus, the task of problem-based learning is to cooperate with students in the effective mastering of the knowledge system and methods of mental and practical activities, to develop in them the skills of creative application of knowledge in a new situation, independence of knowledge and solving educational problems .

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