

PROBLEM-BASED EDUCATION IN "TECHNOLOGY" CLASSES

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Abstract. *In this article, the problem situation can be formed in all educational activities. It depends on the creative approach of the teacher. The importance of the problematic situation is that it focuses students' attention on one place (problem) and teaches students to search and think. When creating a problem situation, it is appropriate for the teacher to tell the students what to focus on. Being able to get out of a problematic situation is always connected with the understanding of the problem, that is, what is unknown, its verbal expression and solution. If we analyze the problem situation mentally, it is primarily the independent mental activity of students. It leads the student to understand the reasons that caused intellectual difficulties, to enter into it, to express the problem in words, that is, to define active thinking. Consistency is clearly visible here: first, a problematic situation arises, then the formation of an educational problem is analyzed.*

Keywords: *the problem is problem-based education, problem-based teaching, problem-based situation symptoms, methods, problem-solving, tools, concept, fact, teaching practice, known given, unknown given, creative activity, identity activity, scientific research, creative method.*

INTRODUCTION

A problem is a task that must be solved in the educational process. Problem-based teaching or problem-based education is considered a natural and effective method of teaching, it is a teaching process that demonstrates the logic of scientific knowledge by creating problem situations. Problem-based education is a form of education that emerged as a positive result of research and experiments conducted in the 70s and 80s of the 20th century. When we think about problem-based education, what is this education, what are its theoretical foundations, how does it differ from traditional education, what is the purpose of problem-based education, the teacher of problem-based education We will definitely face questions about how to do it.

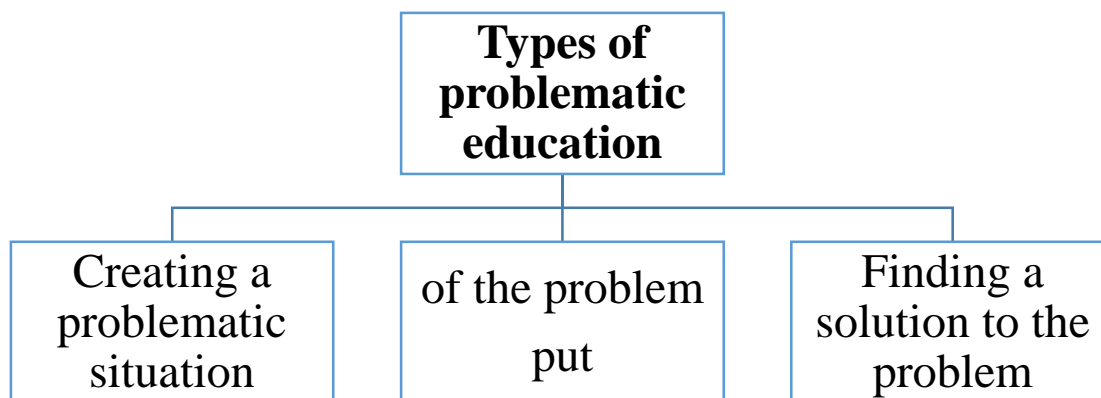
Problem-based education is a teacher's activity aimed at effectively solving the problem of what part of knowledge to give to the student and how to give it. Problem-based education is a joint activity of the teacher and students at the same time in the lesson, which helps to develop an important characteristic of the student's personality - the ability to think creatively. As N. G. Dayri said, one of the main goals of problem-based education is to bring the student's activity to the same level as the teacher's activity in mastering the complex part of the content learned in the lesson. Problem-based learning is influencing students to think freely, express their thoughts freely, and develop their thinking further. In this, the student should be able to listen carefully, think independently and alone, think as a team, analyze, discuss as a majority, and express the collected opinion. If the teacher makes an effective presentation of a new topic, effectively uses visual aids, and works with some students at the end of the presentation, the educational process can be considered effective or active. But this method of education is traditional education.

Problem-based education requires the teacher to act clearly, to take into account every minute of the lesson, to use all his abilities and skills to achieve the desired effect at this time. An important condition for solving this problem is the preparation of the teacher for the upcoming training session. In the preparation process, it is necessary to take into account all aspects of problem-based education and develop its method. Teachers face a number of difficulties in preparing for problem-based education. In overcoming these difficulties, the teacher's innovative creative laboratory is of great importance. One of these difficulties is in choosing the problem-based organization of the lesson and the methods of studying the problem. Because the chosen method not only ensures mastery of the educational material, but also ensures independence in students' activities.

The second difficulty arises in determining the appearance of problem-based learning, that is, does the teacher involve all students in the class in solving the problem, or does the task perform the task to some group of students? These difficulties arise from the teacher's lack of ideas about the problem situation and the description of the problem.

The third challenge is to arouse students' interest in the lesson and continuously develop it. Because the experience and skills of the teacher may not be enough to regularly focus students' attention on one point.

Based on the collected information about problem-based education, it should be noted that this type of education has 3 scientific and methodological aspects (Figure1).



A problem situation can be formed in all educational activities. It depends on the creative approach of the teacher. The importance of the problematic situation is that it focuses students' attention on one place (problem) and teaches students to search and think. When creating a problem situation, it is appropriate for the teacher to tell the students what to focus on.

In the process of solving the problem, the teacher does not tell the students the most necessary idea, but he needs to cite the arguments and facts that form this idea, write formulas, and draw drawings related to the solution of the problem.

A teacher with an innovative creative-skill base can create a problematic situation in the organization of labor education classes. However, finding a solution to the problem requires certain knowledge, skills and abilities, ingenuity, mastery, and skill. Therefore, this process requires technology and design to find a solution to the problem that has arisen. This, in turn, requires the development of a technology to create a problematic situation. Problem-based educational technologies are based on activation and acceleration of student activity.

Ways to create a problematic situation:

- the teacher explains to the students a conflicting situation related to the subject of the lesson and offers to find a way to solve it;

- expresses different points of view on the same issue;
- offers to solve issues that are not sufficient for solution, have excessive information, or the question is posed incorrectly, and b.

Levels of problem solving:

- the teacher sets a problem and solves it himself;
- the teacher sets a problem and finds its solution together with the students;
- students themselves set a problem and find its solution.

Methods used to solve the problem situation:

- study and analyze the problem from different points of view;
- comparison, generalization;
- identification and comparison of facts;
- drawing conclusions depending on the situation;
- the students themselves ask specific questions, etc.

There are various definitions and descriptions of problem-based teaching in the current pedagogic literature. In our opinion, a relatively complete and clear definition was given by M.I. Makhmutova, in which the rules for the application of teaching and learning methods that take into account the activities of problem-based teaching logical thinking (analysis, generalization) and the research of students It is interpreted as a system of activity laws (problematic situation, interest and demand for knowledge...).

The problematic situation arises in specific teaching conditions, which are organized according to the purpose of certain pedagogical tools. It is also necessary to develop special methods of creating such situations based on the characteristics of the studied topics. Thus, a problem situation in teaching is not just a state of mental strain associated with an "unexpected obstacle in the path of thought." It is a state of mental tension specifically required by the goals of knowledge. At the basis of such a situation are traces of previously acquired knowledge and mental and practical methods of action to solve a new task. It is important to note that not all difficulties are related to a problematic situation. Mental effort is not problematic when new knowledge is not connected to previous knowledge. Such toil does not warrant intellectual pursuit. The problem situation is different from any thinking difficulties, in which the student realizes the internal, hidden connections of the object (concept, fact) that required difficulty with the task, problem known to him before and at the same time. Figure 2 shows signs of a problematic situation.

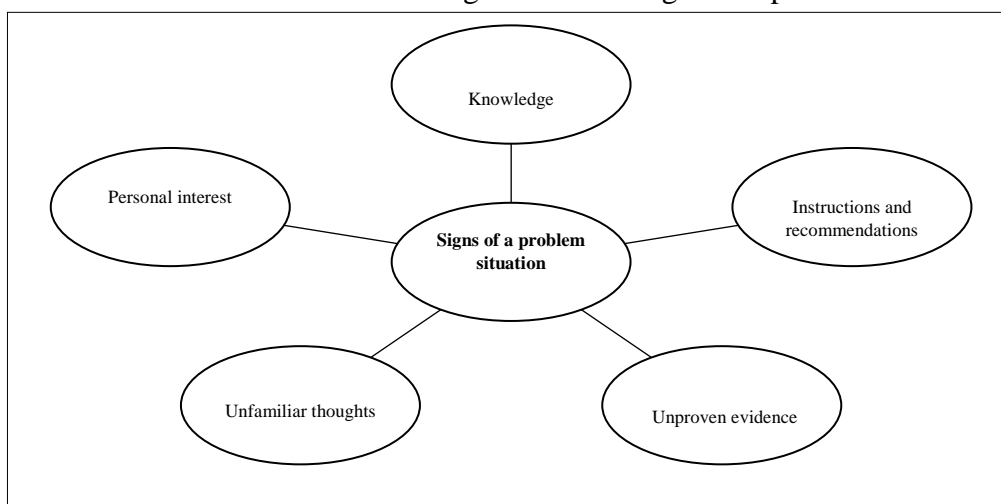


Figure 2. Signs of a problem situation

Symptoms of a problematic situation include:

- the existence of an idea, evidence unfamiliar to the student;
- instructions given to the student to complete the tasks, their personal interest in solving the cognitive difficulties that have arisen.

Being able to get out of a problematic situation is always connected with the understanding of the problem, that is, what is unknown, its verbal expression and solution. If we analyze the problem situation mentally, it is primarily the independent mental activity of students. It leads the student to understand the reasons that caused intellectual difficulties, to enter into it, to express the problem in words, that is, to define active thinking. Here the consistency is clear: first, a problem situation arises, then a learning problem is formed.

In the practice of teaching, there is another option - an option in which the problem seems to correspond to the occurrence of a problematic situation. Expression of the problem in the form of questions in the content of conflicts of facts, judgments, theoretical rules, usually "Why?" reflects the existence of a problematic situation that will be the answer to the question. The problem consists of three components: known (on the basis of the given task), unknown (finding them leads to the formation of new knowledge) and previous knowledge (students' experience). They are necessary to carry out research aimed at finding the unknown (Figure 3).

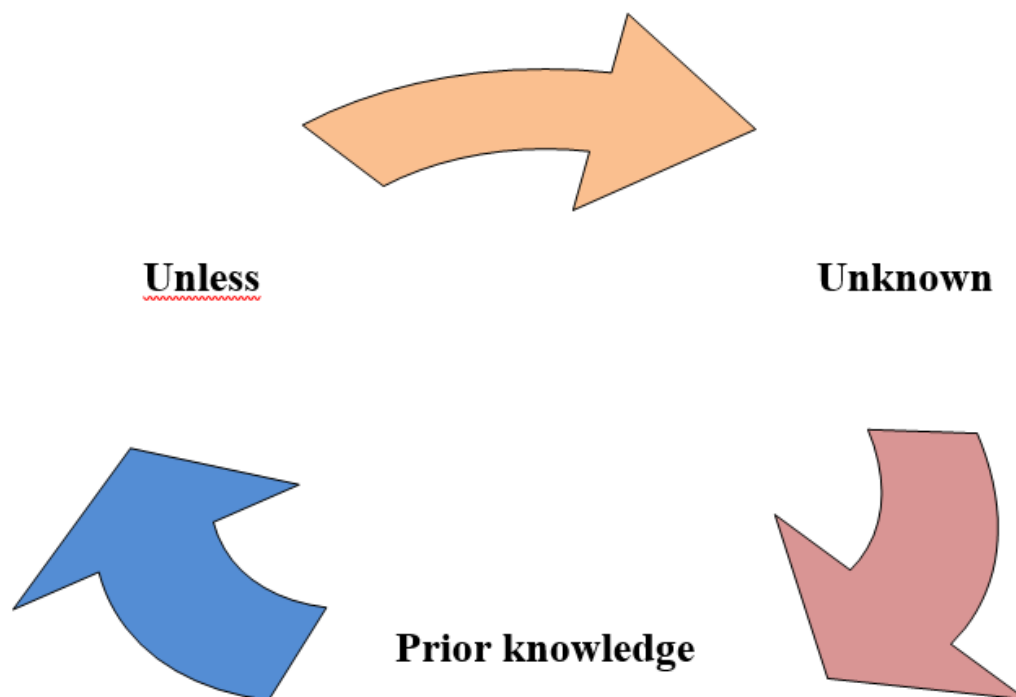


Figure 3. Three components of the problem

First of all, the task of the learning problem is determined, which is unknown to the student, and the methods of its execution and the result are also unknown, but the students, based on their previously acquired knowledge and skills, the expected result or find a solution.

Thus, a task that students know and how to solve it independently cannot be an educational problem; secondly, even if they do not know the methods of solving a task and the means of searching for it, it cannot be a learning problem. Important signs of a learning problem are:

- introduction of the unknown, which leads to the formation of new knowledge;

• students have a certain knowledge reserve necessary to carry out research in order to find the unknown.

In the process of solving an educational problem, an important stage of students' mental activity is to find a way to solve it or to make a hypothesis and justify the hypothesis. The learning problem is developed consistently with problematic 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, create a need for knowledge and encourage the search for active knowledge.

It should be noted that a necessary condition of problem-based teaching is to create a positive attitude in students towards the process of searching for the truth and its results. In problem-based learning, creative and investigative cognitive activity consists of students expressing the problem in the lesson when a problem situation arises, that is, they express in words the essence of the occurrence of cognitive difficulties, and then the methods of solving the problem investigates and makes various assumptions in doing so, the students take as a hypothesis one of the assumptions that they find to be true and prove it, the investigation is completed after the problem or task is completed.

The search period of identity activity can be expressed in special schemes (Fig. 4).

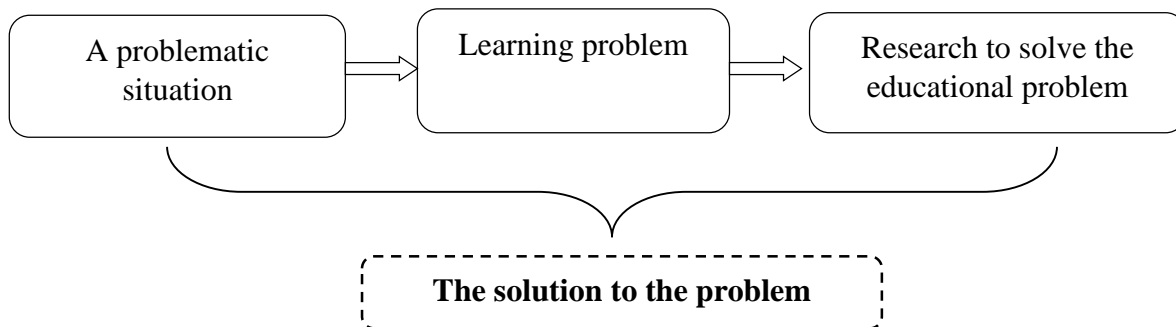


Figure 4. Problem solving sequence

An important aspect of organizing and conducting problem-based training sessions is that the teacher must have a good understanding of both its educational and educational functions. It is necessary for the teacher to never give students a ready-made solution, but to give them a direction to acquire knowledge, to help them to process in their minds the information, events and events necessary for training and life activities.

Problem-based teaching has great opportunities for conscious and solid assimilation of knowledge, determination of one's active attitude to the environment, revitalization of students' cognitive activity. In problem-based teaching, the teacher organizes students' cognitive activities, so that students independently solve intellectual problems based on the analysis of subjects, draw conclusions and generalize, form laws, and apply the acquired knowledge to a new situation. . In some cases, the teacher should not only arouse interest in the students, but also not solve the learning problem by himself, and in other cases, he should guide the independent work of the students in solving the learning problem, as a result, o Students develop the ability to learn knowledge independently and find new ways of mental action by making a hypothesis and proving it, develop the ability to transfer knowledge from one problem to another, and develop their attention and imagination. In the process of problem-based teaching, as students acquire knowledge and mental action methods by perceiving educational materials in a problematic

situation, independently analyze what they have learned, form and solve educational problems by making hypotheses and proving them, intellectual activity of students is ensured in it.

Thus, the task of problem-based teaching is to cooperate with students in the effective assimilation of the knowledge system and methods of mental and practical activity, to create the skills of creative application of previously acquired knowledge in a new situation, to increase the independence of knowledge, education and training is to teach how to solve problems independently.

The problem of practical analysis of the educational process provides an opportunity to determine the uniqueness of teaching. The essence of problem-based teaching is the teacher's special organization of information to be mastered by the learner.

There are a number of conditions for the organization of problem teaching. The first condition is a system of improving educational information. The second condition is that problem-based teaching is carried out, and it provides for the possibility of choosing a method of solving it during the transfer of information to the educational task. The third condition is the subjective position of learners, their ability to understand the goals of learning and make decisions, to evaluate the means at their disposal to solve the problem and achieve the result.

The methodology of conducting training sessions based on problem-based teaching requires justification of the methods used in it. Here: creative, semi-creative or heuristic, problematic presentation of information, presentation of information through problematic initiation are the main methods.

The creative method fully realizes the creative independence of the learner. In it, the student fulfills the task given by the teacher, at the same time, he himself formulates the educational problem, tries to solve the hypothesis independently, conducts research and achieves a positive result. In this way, with the use of the creative method, the activity of students approaches the scientific research activity of scientists. The teacher only guides the scientific research of the students in general, and the tasks provide for the complete periodicity of their independent learning behavior: either information is collected before analysis, or an educational problem is set until it is solved. and solutions are tested and new knowledge is introduced.

It is recommended to use the creative method when passing the most important topics that cover the general foundations of the studied subject. This should lead to the conscious assimilation of all other educational materials. Also, in order to conduct training in such a method, the teacher should consider that the section or topic chosen by the teacher will be convenient for students to understand. Using a creative method in the educational process requires a long time and the creation of special conditions.

Students' creative works are colorful in form. They are preparing the text of a lecture and preparing for a seminar, studying the theoretical situation of this or that issue (one-on-one work with literature, studying archival documents), preparing visual aids, didactic materials, etc.

A partially creative method is used to divide a complex problem into parts and identify its convenient issues step by step, and each step (step) solved in it serves as a basis for solving the next step of the problem. In this, students actively participate in setting educational problems, predicting and proving hypotheses. Their activity includes reproductive and creative elements. In addition to the teacher's statement, observation and summarization of facts, methods of searching (research) conversation, students' answers and filling in are used. In these cases, the compatibility of reproductive and search (research) activities of students is of great importance. They can vary

strongly from independent solving of educational problems at a certain stage, until most of them are solved.

In the literature on pedagogy, there are mainly three different levels (levels) of problematic thinking: at the first level, the teacher himself sets the problem, formulates it, and directs the students to independently search for a way to solve it. At the second level, the teacher only creates a problem situation, and the students formulate and solve the problem independently. At the third level, the teacher observes such a rule: he does not show a specific problem, but "faces" the students with it and directs them to independent creative activity, guides them and evaluates the result. Pupils independently understand the problem, form it, and research ways to solve it.

To facilitate the process of setting the educational problem, it is necessary to follow a certain order. It is impossible to pose a problem without activating the framework of previously acquired knowledge that needs to be solved and is directly related to new concepts. Before organizing problematic tasks, it is necessary to make sure that students have mastered the methods of establishing cause-and-effect relationships, to study the level of students' ability to analyze a problem situation. Also, the teacher may not bring to the students' attention only problems that are convenient for them. At the same time, it is important not to forget that solving the problem depends in many ways on being able to put it correctly. The implementation of these rules is primarily related to the content of the educational material. A number of requirements can be placed on its composition and structure. The training material covers the following content:

- elements of novelty (new concepts, new symbols, features, aspects of unknown concepts, new connections, new ways of moving);
- the conflict between known and new knowledge, covering materials in the form of facts, cognitive tasks and issues, conflicts;
- to logically explain the material of the methodological foundations of the pedagogical theory, taking into account general pedagogical and didactic principles.

It should be noted that the teaching process is not carried out only with the help of "problematic" or "non-problematic" methods, but it is advisable to use other methods for its effective progress. The teacher takes into account the purpose of the lesson, the content of the educational materials, the character of the students participating in the lesson, their level of preparation, listens to them and connects one with the other.

Only then will high efficiency be achieved in the educational process. Also, the effectiveness of problem-based teaching depends in many ways on the creative activity of students, their readiness to express and solve problems. In order to involve them in creative activity, it is recommended to gradually move from the statement of the problematic beginning of the topic to research work, and gradually move from simple to complex in the chain of all methods of problem-based teaching.

In the literature on pedagogy, it is emphasized that the creative activity of students cannot be implemented without the formation of reproductive and re-development methods. If the students do not know and understand the essence of the studied subject, the rules of their use, the teacher cannot organize their creative activity. So, in order for problem teaching to be effective enough, it should be an integral part of the whole educational process. In the process of conducting problem lectures, the formation of motives, valuable guidelines and referrals necessary for creative activity in students takes an important place. It should be noted that the range of motives of educational activity is a set of many motives, but two groups of them are decisive.

Special motives belong to the first group. They include a deep understanding of all life needs by students, an understanding of the social necessity of acquiring knowledge in order to become a specialist. The motivation of this group can be strengthened by the practical application of the concepts of the students by the teacher demonstrating the practical nature of the subject and professional orientation.

The motives of the second group are connected with academic subjects and interest in learning. The teacher can strengthen the essence of this group's motivations by forming knowledge about the knowledge of the students' interest in academic subjects.

METHODOLOGY

The methods of improving the educational process are of particular importance in the process of problem-based education. It is appropriate for the student to use them from the point of view of forming a creative person - a future specialist. The formation and development of students' cognitive independence is of great importance in such teaching, because it provides for the formation of a stable interest in knowledge in students, the regularity of initiative and independent activity, a system of specific mental actions and mental qualities.

It is known that knowledge begins at the level of a specific science for the understanding of students, and as long as its development, ability corresponds to this stage, reaching the inner essence and true content of natural processes and phenomena, and thus mastering original scientific knowledge, this it is necessary to use active, problem-creative methods of teaching. The task is not solved by itself in the process of acquiring scientific knowledge. Its solution draws the mind to a special exercise. In this sense, we are talking about a certain image of studying the educational material, the process of organizational and pedagogical suitability, active development of thinking, cognitive activity and independence of students. So, problem-based teaching is a pedagogical technology of teaching, which synthesizes the creative processes of the teacher and the student according to its content and structure.

The characteristics of pedagogical activity in problem-based teaching consist of the process of clarifying goals by transferring the content of educational information to problem tasks and problem situations. Creative educational activity is managed by giving a certain degree of freedom of actions and organizing these actions in the system of the entire structure of the cognitive process, while maintaining the basic rule of problem-based learning. As a result of organizing problem-based teaching, students have creative opportunities to develop professional knowledge, skills and abilities.

CONCLUSIONS

In conclusion, it should be said that creating a problem situation requires a special skill from the teacher and it cannot be done without any preparation. Creating a problem situation, ensuring the active participation of students to solve this problem, involving them in independent thinking requires creativity from the teacher. In the process of solving a problem situation, students learn to think independently and think independently through the effective use of resources. The ability to organize a problematic situation is realized as a result of the teacher's innovative activity.

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