



## METHOD OF DEVELOPMENT OF LOGICAL THINKING WITH THE HELP OF INNOVATIVE TECHNOLOGIES IN TEACHING BIOCHEMISTRY

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### ABSTRACT

*The article discusses the methods of problem-based learning of the discipline "biochemistry" as a valuable innovative technology in the educational process of a medical university. The methods of creation are analyzed and directions of solutions to problem situations proposed in the process of studying and mastering new knowledge by students are proposed.*

The development and implementation of new generation standards in the educational process in a higher educational institution provides, as a strategic goal, the training of specialists with a high level of professional skills, capable of solving practice-oriented tasks. In this regard, the organization of the educational process at any university department should ensure the introduction of modern active and interactive teaching methods that will form students' skills of professional competence, practical skills and readiness to implement them in future activities.

A medical specialist is obliged to know and master the communicative technologies of pedagogical communication, in particular, the features of the methods of persuasion, informing, teaching, explaining, emotional support in order to develop adherence to treatment (compliance) in sick people, and in healthy people - maintaining a healthy lifestyle, prevention and health promotion.

The relevance of this statement is confirmed by one of the main directions of the state policy strategy for the development of the domestic system of medical care for the population, which consists in a gradual transition "from a paternalistic attitude towards patients to the principle of information consent, mutual responsibility and cooperation." In this regard, when studying the discipline "biochemistry", the preparation of methodological support for new educational technologies and their introduction into the educational process at different faculties is carried out. Basically, new methods relate to contextual learning, which is based on the development of situations from the practical professional future activities of students with the help of various didactic means. Active learning methods are student-centered and based on independent and practical activities. The trainees themselves are directly involved in the formation of the necessary knowledge, skills and abilities.



The use of these methods contributes to the formation of students' meta-competences, which formed the basis of communication skills, including expressing their thoughts accurately, being able to listen to others, arguing their point of view, and developing confidence in themselves and their abilities.

In higher education, there has always been an interest in everything new related to the study of biochemistry. The analysis of modern approaches to teaching biochemistry in this article acts as its own form of active attitude to the teaching of the discipline in the educational process of medical universities, which implies its further theoretical and practical understanding and application.

Problem-based learning refers to the ways of organizing the creative activity of students [1, 2, 3].

Problematic is this type of education in which the study and assimilation of new knowledge by students is carried out through the systematic formulation and solution of educational problems.

The practice and theory of problem-based learning shows that the principle of problematicness can be applied in teaching absolutely any discipline, at any stage of the formation of knowledge, skills, and abilities.

There are three methods of problem-based learning:

1. Problem statement: the essence of the method - the teacher, using the example of a cognitive task, demonstrates the path of scientific thinking in the process of analyzing the problem and finding ways to solve it. In a problem statement the decision is more conclusive and the knowledge gained in the process of scientific thinking is more conscious and more easily converted into beliefs. The result of the problem statement is the assimilation of the method and logic of solving problems of a certain type;
2. Partially search (heuristic): the educational problem is solved jointly by the teacher and students: the problem is divided into a number of research subtasks for subgroups of students. The role of the teacher is to manage the actions of students and help them go through the individual stages in solving the problem. The method forms in students a search, creative activity to solve new problems for them;
3. Research: organization of search activities of students directly in the classroom (practical and laboratory classes, seminars, etc.) and in independent work when doing homework; The students solve the problem posed by the teacher on their own. Often, research goes beyond the classroom and acquire scientific and practical value. The method is used in the research work of students (NIRS), when performing the experiment of term papers and theses.

All these methods of problem-based learning have proven themselves well in the study of all sections (modules) of biochemistry.

When studying the discipline, professionally oriented situational tasks are widely used. When solving situational problems, students can form a problem situation if a state of intellectual difficulty develops, when they cannot explain a new fact with the help of knowledge known to them and perform the necessary action to solve it in the same familiar ways, therefore they must find a new way of doing things.

There are a number of types of problem situations that arise in different cases, in particular:



1. when revealing a discrepancy between the existing knowledge of students and the requirements of new educational problems;
2. if students have a variety of knowledge, and to solve the problem, the choice of the right ones is required, which activates the search activity;
3. in the presence of new practical conditions, the problem of finding new knowledge for solving practical problems arises;
4. in case of contradictions between the theoretically possible way of solving the problem and the practically achieved result of completing the task and the absence of its theoretical justification.

To create a problematic situation, you need:

- the readiness of the student for educational work, his desire to engage in active mental activity;
- availability of a task;
- the trainee's lack of knowledge about how to complete the task;
- the trainee has the knowledge necessary to understand the problematic task and include it in the search activity of the content.
- construction and analysis of graphs, diagrams, schematic diagrams, development of activity algorithms;
- promotion of real-life problems of the studied science;
- setting tasks for the use of logical methods of inference, comparison, classification, generalization, analysis, etc.

The main goal of the group discussion is collective discussion and problem solving based on the activation of students' cognitive activity. They learn to express their point of view, listen to other people's opinions, communicate and interact in a group, analyze difficult situations, and make a collective decision.

We have developed the main stages of the group discussion:

- the topic of discussion is communicated to students 1 week before class, students must prepare;
- at the lesson, after the teacher's introductory speech, a free discussion begins with hearing the opinions of the discussion participants (3-7 minutes);
- At the end of the discussion, the teacher sums up and summarizes the proposals put forward.

Group discussion can be in the form of work in small groups of 3-5 people, in which collective thinking is developed on the proposed problem, which predetermines active participation in the discussion.

If the roles of participants (specialists) are distributed among students in advance to solve the problem, then the method of role-playing or role-playing games can be used. Participants in the discussion are given appropriate instructions. The lesson can be held in the form of a meeting to develop a joint solution to the problem situation.

Thus, coordination and consistency in the content, volume and sequence of using various methods of problem-based learning in higher education allow the teacher to shape the formation of the personality of the future doctor, who has experience in creative independent activity and is ready for constant professional growth in the future profession.



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