



## PROBLEM-BASED LEARNING BASED ON THE IMPLEMENTATION OF INTER-SUBJECT CONNECTIONS OF CHEMISTRY AND BIOLOGY

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**Таянч сўзлар:** tushunchalar, qobiliyatlar, pedagogik texnologiyalar, muammoli ta'lim, aqliy faoliyatni rivojlantirish.

**Ключевые слова:** понятия, умения, педагогические технологии, проблемное обучение, развитие мыслительной деятельности.

**Key words:** developing concepts, abilities, pedagogical technologies, problem education, mental activity.

Introduction. Modern society often finds itself in situations where we face complex tasks. It is because of these difficulties that we understand that there are still many unknown facets in the world around us. Consequently, people need a deeper knowledge of the world around them, any new processes, properties are constantly being discovered, and relationships between people are being learned. Thus, the creation of students' intellectual activity culture has always been and remains one of the main educational and general educational tasks. The intelligence development is an important aspect of training the younger generation. His success should be achieved, first of all, in the lesson, when the teacher is left alone with his students.

In the renewal of society and changes in the goals and objectives of school education, the diversified development of the child's personality, including his intellect, the ability to think independently, to show elements of creativity, skills and thinking skills, comes to the fore. The realization of these goals is impossible without the provision of truly developmental education. Although the learning and mental development problem is one of the oldest psychological and pedagogical problems, in recent decades, theorists and practitioners of Russian education have been paying more and more attention to the education developing problems. At the



same time, it cannot be said that the education developing idea is new, that earlier the child development problems in the learning process were not posed and solved. The creative personality preparation at all times has been a national importance task. If we analyze the modern educational process and the currently formed goals of education, it is easy to see that the main priority is given to the child's personality development. [1]

Work on the students' development is of particular importance and is the foundation for the further formation of the student's personality. Everything that is laid down to students determines the success and the forming process level a person's personality, his worldview, and his development for many years to come. The qualities, knowledge, abilities and skills acquired at school provide not only the basis for further education and upbringing of a teenager or young man at school or in another educational institution, but also largely determine the practical, social and professional activities qualities of an adult. One of the factors in the intellectual sphere study of schoolchildren is the problem learning phenomenon. Depending on the goal, on the task of the school, teaching can be problematic and not problematic. If the school is given the task of developing students' thinking and their creative abilities, then pedagogically correctly organized teaching cannot but be problematic.

So, when studying the alkali metals properties, the following task can be proposed: «Reveal the water role in the alkali metals interaction reactions with solutions of various salts». To create a problematic situation, the teacher can suggest a problematic question: «How will the reaction take place between lithium and copper (II) sulfate solution?». During the experiment and further analysis of its results, students come to an understanding of the ongoing processes essence.

With the teaching research method, the cognitive activity of schoolchildren in its structure approaches the scientist research activity that discovers new scientific truths. Thus, the teaching research method is one of the most effective ways of organizing problem-based teaching, providing the highest level of cognitive independence of students. [2]

The listed ways of organizing problem learning are not the only possible ones; there may be others, the feasibility and effectiveness of which can only be confirmed by practice.

The ways to create a problem situation can be very diverse. For example, some facts demonstration that are unknown to students and require additional information to explain. They encourage the search for new knowledge. The teacher demonstrates allotropic modifications of elements and offers to explain why they are possible, or, for example, students do not yet know that ammonium chloride can sublime, but they are asked the question of how to separate a mixture of ammonium chloride and potassium chloride.



The problematic principle includes: the logic of building the educational process and the content of the studied material; methods of organizing educational and cognitive activities of students and managing it; assimilation by the teacher of the organizing theory content and essence the problem learning process; the lesson structure and the forms of teacher control over the process and the result of students' activities; mastering by the teacher the forms, methods and technical means of teaching; systematic creative application by the teacher of what has been learned in practice.

Teacher's good didactic preparation is especially important today, because without knowledge of general theory it is impossible to create, and the teaching process itself is an art, an art to captivate children with their subject, to surprise with the thought, knowledge beauty, and to induce independent mental actions. Our schools task is to form a harmoniously developed personality. The most important indicator of a comprehensively and harmoniously developed personality is the presence of a high level of thinking ability. Teaching, in which the teacher, relying on knowledge of the patterns of thinking development, with special pedagogical means, conducts purposeful work to form the thinking abilities and cognitive needs of his students, is problematic. Understanding the problematicity essence as cognition regularity, defining its role in learning and introducing —the problematicity principle concept into didactics opened up new opportunities for a theoretical explanation of the way to enhance the educational and cognitive activity of students. [3]

Most of the modern publications on learning theory are associated with the idea of enhancing the educational process and educational activity of students. By activation, we mean the effective use of those techniques and teaching methods that are known from traditional didactics. You can talk about activation with the help of problem learning, while understanding the creation of problem situations and the formulation of cognitive tasks. The problemdeveloping learning theory is presented today in the fundamental provisions development of the concept of problem-based learning by domestic teachers and psychologists.

There are several approaches to the interpretation of the concept of problem learning and this is a set of actions such as organizing problem situations, formulating problems, providing students with the necessary assistance in solving problems, testing these solutions and, finally, guiding the systematizing and consolidating process the acquired knowledge.

Problem-based learning is a type of developmental learning, the content of which is represented by a system of problematic tasks of various levels of complexity, in the process of solving which students acquire new knowledge and methods of action, and through this, the formation of creative abilities occurs: productive thinking, imagination, cognitive motivation, intellectual emotions.



Problem-based learning is a teacher-organized way of active interaction of the subject with the problem-presented content of learning, during which he becomes familiar with the objective contradictions of scientific knowledge and ways to solve them. Learns to think, creatively assimilate knowledge. Consider the features of the methodology for problem learning. Teaching students ready-made methods of mental activity are the way to achieve normal activity, not creative.

Conclusion. In the conclusion of this article, we can single out the goal of activation through problem learning is to understand the level of assimilation of concepts and to teach not individual mental operations in a random, spontaneously evolving order, but a system of mental actions for solving non-stereotyped tasks. This activity consists in the fact that the student, analyzing, comparing, synthesizing, generalizing, concretizing factual material, himself received new information from it. In other words, this is an extension of the deepening of knowledge with the help of previously acquired knowledge or a new application of previous knowledge.

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#### РЕЗИОМЕ

Maqola maktabda kimyo darslarida muammoli ta'lim texnologiyasidan foydalanishga bag'ishlangan. O'quvchilarning muammoli ta'lim, ko'nikma va malakalarining dolzarbligi ta'kidlanadi; ta'limning turli bosqichlarida muammoli vaziyatlardan foydalanishga misollar keltiriladi.

#### РЕЗИОМЕ

Статья посвящена использованию технологии проблемного обучения на уроках химии в школе. Подчеркивается актуальность проблемного обучения, навыков и умений учащихся; приведены примеры использования проблемных ситуаций на разных этапах обучения.

#### SUMMARY

The article is devoted to the use of problem learning technology in chemistry lessons in schools. The relevance of problem learning, the students' skills and abilities is emphasized; examples of the problem situations use at different learning stages are given.