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**ACMEOLOGICAL INNOVATIVE TEACHING OF CHEMISTRY**

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**АКМЕО ИННОВАЦИОННОЕ ОБУЧЕНИЕ ХИМИИ**

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**ABSTRACT**

Pedagogical technology envisages the widespread use of creative processes, the development of students' creative activity, and the implementation of planned educational standards through the acquisition of established experience.

The principles of expediency, integration, differentiation, optimization, safety, effective results should be followed when selecting pedagogical technologies and including them in the process of chemical education. The theoretical foundations of modern chemistry methodology are educational technologies, integrative approach, leading ideas, humanization, innovation, new technology and the principles of their implementation. An integrative approach, individual achievement and a methodological approach based on different components are understood. The basis of pedagogical technology is a didactic process with three interrelated components: students' motivation, cognitive activity and the management of this activity. Depending on the initial pedagogical considerations that form the basis of each component of the didactic process, different technologies are obtained, which have a large number of processes. Each student learns and develops in personality-oriented technology. There is an unusual atmosphere of cooperation and mutual assistance in the classroom, there is constant communication in pairs and groups, children do not get tired, there is a constant change of activity, systematic assessment and self-assessment is carried out.

**АНОТАЦИЯ**

Педагогическая технология предполагает широкое использование творческих процессов, развитие творческой активности студентов, реализацию плановых образовательных стандартов за счет приобретения наработанного опыта. При выборе педагогических технологий и включении их в процесс химического образования необходимо руководствоваться принципами целесообразности, интеграции, дифференциации, оптимизации, безопасности, эффективных результатов. Теоретическими основами современной методологии химии являются образовательные технологии, интегративный подход, ведущие идеи, гуманизация, инновации, новые технологии и принципы их реализации. Понятны интегративный подход, индивидуальные достижения и методологический подход, основанный на разных компонентах. В основе педагогической технологии лежит дидактический процесс с тремя взаимосвязанными компонентами: мотивация студентов, познавательная деятельность и управление этой деятельностью. В зависимости от исходных педагогических соображений, лежащих в основе каждого компонента дидактического процесса, получаются разные технологии, которые имеют большое количество процессов. Каждый ученик учится с помощью личностно-ориентированных технологий. На уроках необычная атмосфера сотрудничества и взаимопомощи, постоянное общение в парах и группах, дети не устают, происходит постоянная смена активности, проводится систематическая оценка и самооценка.

**Key words:** new technology, pedagogical technology, innovative technology, didactic technology, training, education, development, components, technology features, conditions for the application of technology

**Ключевые слова:** новая технология, педагогическая технология, инновационная технология, дидактическая технология, обучение, образование, развитие, компоненты, особенности технологии, условия применения технологии

The preconditions of subject teaching technology in chemistry are based on its ability to organize the teaching process controlled by its algorithms. Using technology in teaching does not mean applying effective knowledge management techniques and shaping thinking. Pedagogical technology envisages the widespread use of creative processes, the development of students' creative activity, and the implementation of planned educational standards through the acquisition of established experience.

The principles of expediency, integration, differentiation, optimization, safety, effective results should be followed when selecting pedagogical technologies and including them in the process of chemical education.

The basis of pedagogical technology is a didactic process with three interrelated components: students' motivation, cognitive activity and the management of this activity. Depending on the initial pedagogical considerations that form the basis of each component of the didactic process, different technologies are obtained, which have a large number of processes.

There are three main directions of the use of technology in the teaching of chemistry:

- creation and application of new subject teaching systems meeting technological principles;
- use of evolving pedagogical technologies that provide information in the process of teaching chemistry;
- creation of methodological bases of various technological systems in the consistent study of chemistry.

Features of educational technology. At present, various educational technologies are used in chemistry education. Educational technology is called pedagogical technology used taking into account the characteristics of the subject.

Educational technology is based on the following necessary structural components:

- a new quality goal achieved by technology;
- content, goal development;
- the technological process of education is mainly given to subjects, teachers, students and those taught;
- the technological environment consists of relatively unchanging external factors, including the educational standard, the system of criteria for measuring the quality of the realized goal, the system of indicators and parameters;
- technological conditions: one of the controllable factors, compliance with safety rules, teaching material, psychological, pedagogical, didactic, ergonomic and economic conditions;
- effective result as an indicator of the achieved goal.

Educational technology can be organized on the basis of the following necessary and sufficiently

functional components in accordance with the structural components.

The most important features of educational technology are:

- organization of technology in an expedient form,
- technology forecasting according to the initial and final result,
- creation of multi-level innovative technology management system
- criteria, linking standard technology to monitoring and evaluation,

The use of any educational technology, the expression of goals in the results: the achievement of educational goals, the optimization of the teaching process, requires students to have planning skills, chemical knowledge, and creative experience of the new generation.

The most important conditions for achieving the planned results are:

- modern educational standard;
- relevant educational technology used by the teacher;
- stages of operation of technological components: monitoring of processes and means;
- students' independence and creative activity;
- application of step-by-step integrative quality measurement techniques, obtained results.

The theoretical foundations of modern chemistry methodology are educational technologies, integrative approach, leading ideas, humanization, innovation, new technology and the principles of their implementation. An integrative approach, individual achievement and a methodological approach based on different components are understood.

Based on values, the correct definition of the topic outcomes is associated with the development of the human factor. Innovation is the application of new ideas, activities, innovations and tools to the educational process. The new technology covers the use of modern traditional and non-traditional technologies in the process of chemical education. Principles such as purposefulness, optimality, integration, complexity, manageability, and effective results should be guided in the selection of educational technologies and their inclusion in the chemical education process.

There are various forms of educational technologies used in the process of teaching chemistry in primary and secondary schools. It is important for the future teacher to know the features of modern educational technologies:

- explained,
- problematic,
- integrative module,
- algorithmic,
- personality oriented,
- entertaining,

- rating,
- innovative,
- interactive,
- distinguished by an integrative form,
- informed and relevant,
- lectures and seminars,
- combined,
- interactive,
- control and regulation;
- adapted to compensation,
- natural contact,
- full mastery of knowledge,
- feedback,
- discussion training, etc. [2]

2. To identify significant differences in education, technology must answer two or three questions:

- What is the purpose of this technology?
- What are its special means, methods, processes, techniques?
- What are the main features?

Advanced educational technologies are used in the practice of chemistry education in modern schools.

Problem-based learning (PT) is a purposeful educational process based on the joint activities of teachers and students, characterized by the initiative and implementation of educational problems. Problem-based learning technology has its own characteristics. The features of problem-based learning are related to the problem situation, the problem of education, creative activity, independent search. The problem situation, the state of intellectual difficulty encountered by students in solving cognitive tasks in new ways of knowledge and activity are understood, conditions are created for motivation and optimal activity, easily managed educational process continues.

Psychologists distinguish three main components in the structure of the problem situation:

- identification of contradictions that play the role of the driving force of the cognitive process;
- correct determination of the motive for action to resolve the conflict;
- creativity and existing life experience in students' intellectual cognitive activity.

The problem of education is a special form of the unknown cognitive task, which contains contradictions that motivate students to search and motivate their creative activity.

The problem arises in the minds of students in a contradictory situation. Realizing the problem of education means going beyond the boundaries of existing knowledge and realizing one's own ignorance.

Students' creative activity is subjectively associated with the search for and discovery of new knowledge and methods of action through the formation and solution of theoretical, practical and other educational problems.

Technology of problem-based teaching in chemistry In the process of studying chemistry, it is important to know the cases of problem situations and their solutions. The problem situation arises in the following cases:

- encourages students to seek new knowledge;
- when there is a need to explain the experimental facts observed;
- based on the theory, with the help of the teacher, the students confirm the accuracy by experience;
- students do not understand and express everything as it is before discussing the problem. Wrong decisions are corrected through discussion;
- experimental facts and the end result are known, but it is necessary to suggest ways to solve the problem with the most rational choice;
- it is important that students solve non-standard creative problems.

Problem-based learning technology is divided into special stages:

- organization of students' mastery of the problem of education by updating their existing knowledge and skills;
- creating a problematic situation;
- formation of the educational problem in the form of cognitive task;
- make a plan to make a hypothesis and test it;
- an advanced hypothesis to solve a learning problem by confirming or denying you;
- experimental confirmation of the correctness of the solution; self-reflection and self-assessment of activities. [3]

In problem-based chemistry teaching technology, it is advisable to use the methods recommended and grouped below.

Problem presentation methods - problem-based teaching methods used by the teacher are monologue presentation, dialogical presentation and demonstration presentation.

Methods of independent search activities are problem-based learning methods performed by students: heuristic, research, research projects, research, search chemistry experiment, etc.

The peculiarity of the technology of problem-based teaching of chemistry is that it focuses on the solution of humanization tasks, the development of intellectual and creative abilities, as well as the motivation of students and the moral qualities of personality. Let's open the essence of technology with an example learned from the experience of a chemistry teacher. The teacher sees the following as the main contradictions in the school. It seems that a small number of students create excellent conditions for the development of each student, to achieve high educational results, but in practice this is not the case.

The majority of students in small schools are below the level of urban peers in terms of both development and knowledge. At first glance, it seems that the reason for this is that the level of teaching is not high enough, because the teacher teaches several subjects without proper education, but not everything is so simple. Many teachers have higher education and extensive work experience, in addition to the material base, many rural schools do not lag behind urban schools.

The main reason is the insufficient development of teaching and educational methods in schools and the use of methods of working with large classes. This leads to a greater psychological burden on students due to daily questioning, lack of communication, loss of cognitive interests, which affects the teacher: he loses interest in the profession because students have a low level of preparation. [1]

The main problem of the school is to create an easy environment for cooperation between the teacher and the students, to organize the students in such a way as to increase their interest in the subject. Didactic games should be widely used in student-oriented learning technology. Didactic games often help to turn the lesson from boring to interesting activities, increase the ease of the learning process and lift the spirits of teachers and students.

The use of modeling and chemical experiments allows not only to develop students' skills, but also to organize the discussion of teaching materials, to prepare joint results. However, a "global" solution to the problem can be achieved not only with chemistry lessons, but also with a person-centered organization of the entire educational process. With a person-centered organization of the learning process, lessons become more interesting, students become more independent, and joint activities become more effective.

Student-oriented learning technology consists of three stages that are characteristic of each type of activity:

1. The motivational stage where the goal of education is set, the way to achieve it in the process of joint activity is planned, at the same time learning is motivated. At this stage, the questions are solved: where are we? Where are we going? Why and what do you need to learn? How can this be done?

2. The operational and execution phase in which the planned plan is implemented, the results are discussed and modeled.

3. The reflexive-evaluation stage, in which the results are evaluated, self-assessed, and new problems arise to solve them. At this stage, the questions are clarified: have we reached the goal? How did I achieve

this? Can I do it alone? Where are we now? Where are we going? How can this be done?

In this technology, every part of the lesson is everyone's business. The role of the teacher is the optimal organization of students' self-education activities. Students learn new things independently and creatively, step by step, subjectively, discuss the results, compare the results with others. Each student learns and develops in personality-oriented technology. There is an unusual atmosphere of cooperation and mutual assistance in the classroom, there is constant communication in pairs and groups, children do not get tired, there is a constant change of activity, systematic assessment and self-assessment is carried out. [4]

Personality-oriented (developmental) chemistry teaching technology requires a teacher to be completely selfless, creative approach to work and love for children, respect for everyone's personality. When a chemistry teacher puts all his energy into his work, it is easier to get the expected result.

An important outcome of student-centered learning is confidence in each student's abilities and skills. Gradually, students develop the skills of universal learning to express ideas in the form of judgment, to compare independently, to determine the basis of the material studied, to give definitions, to accept the world as a whole, and so on.

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