

Technology of Organizing the Independent Study Activity of Students in Higher Education Institutions on the Basis of Problem-Based Education

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Annotation: This article describes the recommendations on the organization of independent educational activities of students in higher education institutions based on problem-based learning and the development of independent learning and skills of students. Currently, organizing students' independent educational activities based on the demands of the times, increasing their thinking ability as a result of problem tasks, self-development, determining the level of their knowledge, and educating a perfect person based on innovative approaches to education are among the main problems. One of the most effective factors for improving the quality of education is the organization of independent education for students and the formation of independent study skills and qualifications based on a competency approach. Independent thinking is important in order to find solutions to the problems faced by students in order to put the theoretical knowledge they have learned into practice. Independent learning activity is considered important in mastering physics, like all academic subjects, and the ability to independently acquire knowledge and apply it in practice is becoming the most urgent task of today. The article describes the formation of independent learning skills in students based on problem-oriented educational technologies.

Key words: Activity, competence, creativity, ability, skill, competence, technology, observation, search, problem based, independent.

Relevance of the topic: Proper organization of independent learning activities is important for activating students' cognitive activity and improving knowledge efficiency. In the organization of independent educational activities through problem-based teaching, it is an urgent problem to justify the achievement of high level development of their mind, thinking, and abilities without providing them with a collection of various evidences.

Description of the topic: Problem-based teaching is carried out by asking students unfamiliar theoretical or practical questions. Solving such problems requires students to independently search for new solutions. Therefore, the problem-based teaching process is always organized by developing the spirit of creativity in the students' activities. Studying and learning of students is the basis of knowledge of the laws of development of nature and society. Because it is important for them to be able to think actively in the process of learning. Because problem teaching serves as a source of thinking and a means of knowledge. For students in independent learning activities, if they: a) feel the complexity of knowing; b) if there is an interest in knowing them; c) an effective result will be achieved if the cognitive process is carried out based on their experiences and knowledge. The problem-based teaching process is divided into three types according to the involvement of students: problems intended for the whole group, problems intended for individual students and those who wish. The problems intended for the whole group are mainly presented to the students by the teacher, and the students find the solution of the problem based on their personal thoughts. Students' opinions are summarized and the solution of the problem is concluded. In the second type of problem-based teaching, each student is given a separate problem assignment, and each of them works independently and finds a solution. Each student's opinions are analyzed individually.

According to the content of problem teaching in physics, it is divided into theoretical, practical and mixed types of problems. Theoretical problems are used in summarizing new laws, theoretically justifying the results of experiments, and working on problems with research. Methods of solving various practical problems of students and the theory of the development of practical work are implemented through the type of practical problems of problem-based teaching. However, even if the problem is solved in a practical way, it is concluded through theoretical knowledge. When solving mixed-type problems, students are required to combine theoretical and practical knowledge. For example, let's look at the example of the topic "Electric current in electrolytes". The main goal of studying this topic is to make students aware of the nature of electric current in electrolytes. Let's start the topic with a problematic question arising from the fact that pure distilled water does not conduct electricity in the experiment, and after mixing a solution of table salt in water, the liquid becomes conductive: "What is the nature of the electric current in the electrolyte?" "What serves as a carrier of electricity?" - should clarify such questions. In the process of solving the problem, students' thinking is given in the following sequence: "What do I know about electricity?". Electric current is the orderly movement of charged particles. So there are charged particles in the electrolyte and they are in orderly motion. Students' thinking is strengthened by an experiment that proves the passage of current through a solution of copper sulfate in water. After that, they asked: "What are the current-carrying particles in the electrolyte?" a question arises. Students' fiction on this issue can be as follows: "In metals, such particles are

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considered electrons. What about electrolytes?" So, in this case, we can say that a problematic situation has arisen. They try to understand the content of the problem and manage to find its solution, which may be as follows. "What other particles besides the electron can be among the free carriers of charges? Protons? No, they are in the nucleus of an atom. What about the ions? How do they appear in a solution of copper sulfate in water?" New information is needed to find answers to these questions. For this purpose, students choose the logic of independent thinking and the content of the educational material to find a solution to this problem. Students pay attention to the internal structure of the substance, realizing that mastering new material depends on the chemical composition of the substance.

The sequence of thoughts determines the elements of new knowledge that students acquire and the basic knowledge necessary for their acquisition. Definitions of information about auxiliary concepts for mastering educational material are studied theoretically. In the course of this lesson, a plan is made to activate students' basic knowledge, understand the problem and find a way to solve it. In order to master a new topic, it is necessary to use the previously studied materials with independent thinking. In the type of teaching intended for those who wish, there are several problematic questions, and students have the opportunity to choose the questions. The solution of the problems is studied independently by each student. The problem situation is studied by the independent work of the students without the purposeful organized action of the teacher: reading the textbook or additional literature, studying from the press, solving the problem or conducting an independent experiment. The creative way of working in increasing productivity leads to a quick solution to the problem, and the introduction of pedagogical technologies in the use of creative techniques is important. It is necessary to pay attention to technical processes that have a number of advantages in organizing independent study. Research and observations show that at all levels of the educational system, technological problems arise in the organization of independent work of students and practical experiences. Full independence of students plays a key role in this. The main goal of the teacher in each case is to correctly plan the activities of students, to direct them to the right path, and to make conclusions on time about their work and make the necessary corrections.

Conclusion: Finding solutions to problematic issues as a result of students' independent creative research contributes positively to the development of their thinking. The main goal of independent study should be directed to the achievement of the goal set by the student, not the student's ability to do it without the help of the teacher. Pedagogical monitoring of students' independent work is the teacher's provision of scientific-pedagogical aspects of students' independent study and practical assistance to students in performing educational tasks.

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