

# Development of The Educational-Cognitive Activity of Students of Technical Higher Education Institutions Based on Modern Educational Approaches

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**Abstract:** This article examines in detail the theoretical and methodological foundations for developing the educational-cognitive activity of students in technical higher education institutions. The study considers the content, structure, factors of formation, and methods of developing educational-cognitive activity based on modern pedagogical approaches. In particular, methods for increasing the effectiveness of education through the integration of interactive methods, problem-based learning technologies, project work, and digital technologies are scientifically substantiated. The author proposes a comprehensive approach to the development of the educational-cognitive process.

**Keywords:** Educational-cognitive activity, pedagogical methods, interactive methods, problem-based learning, project-based activity, digital learning, competencies, independent learning, technical education.

**Introduction:** At present, the education system is undergoing global changes, in which the introduction of innovative technologies, the application of effective teaching methods, and the orientation of students toward independent learning are among the main objectives. In technical higher education institutions, this issue is of particular importance, since the specialists trained here will work in the fields of production, technology, and engineering in the future. While the traditional education system is aimed only at providing students with knowledge, modern educational approaches aim to shape them as independent thinkers, creative individuals, and problem-solvers. Therefore, the development of students' educational-cognitive activity is considered one of the important pedagogical tasks.

1. Theoretical and methodological foundations of the educational-cognitive process. Educational activity is a process aimed at the acquisition of knowledge by an individual and is a complex psychological and pedagogical process. This process consists of elements

such as internal need and curiosity for learning, assimilation and comprehension of knowledge, application of knowledge in practical activity, and self-assessment. The integrated development of these elements determines the effectiveness of the educational process [1].

According to psychological research, the process of a student's reading and learning is directly related to his or her motivation. Students with strong internal motivation master knowledge more thoroughly and strive to complete independent tasks.

2. The importance of interactive methods in improving the educational process. Interactive methods are a main part of modern education, and they engage students as active participants in the learning process. These methods ensure effective communication between the teacher and the student [2]. In addition, interactive methods create conditions for increasing students' independent thinking, strengthening knowledge through discussion and debate, developing teamwork skills, and enhancing a creative approach. For example,

the methods of “brainstorming,” “cluster,” “debate,” and “case-study” are considered effective in teaching technical subjects. In addition, the effectiveness of such methods developed by the author as the educational labyrinth, the skills staircase, the innovation workshop, the knowledge quest, and the practical journey was also clarified during the experiment. In classes organized with the help of these interactive methods, students do not receive knowledge passively, but rather acquire it actively.

3. The main purpose of problem-based learning technology. Problem-based learning is a didactic method aimed at developing students’ independent thinking. In this method, the teacher creates a problematic situation and encourages students to search for its solution [3]. In problem-based learning, it is necessary to create a problem situation, understand the problem, put forward a hypothesis, find a solution, and evaluate the result. This process develops students’ analytical thinking, problem-solving, and decision-making skills.

4. Teaching activity based on projects. Project activity is a new form of modern education that directs students to engage in practical work. With the help of this method, students acquire knowledge in the process of solving real problems [4]. In implementing project activity, a problem is identified, planned, carried out, and the result is presented. At present, the participation of technical field students in various projects can serve as an example of this. This approach develops students’ creative thinking, independent work, and professional competencies.

5. Digital technologies and the effectiveness of education. Modern communication and information technologies are seriously changing the educational process. Through digital technologies, education is becoming more interactive and effective [5]. The effective use of digital tools offers such advantages as personalization of education, the use of visual materials, distance learning opportunities, and virtual laboratories. In addition, the electronic educational platform developed by the author, <https://uquvbiluv.e-darslar.uz/>, also effectively serves in providing basic knowledge to future engineer-technologists in mastering professional knowledge. Its effectiveness was also determined as a result of the experiment. This shows that digital technologies significantly develop

students’ process of studying and acquiring knowledge.

6. Integration of modern methods. The successful development of students’ educational-cognitive activity in technical higher education institutions cannot be completed through only one method or approach. From the point of view of modern pedagogical education, in order to achieve high results, it is important to integrate various pedagogical technologies with one another. The integrated approach guarantees that the educational process will be systematic, consistent, and effective. The main meaning of this approach is that interactive methods, problem-based teaching, project activity, and digital technologies are used as a single didactic system. This helps students not only to acquire knowledge, but also to apply it in practical activity [6].

The integrated pedagogical approach is implemented in the following main directions [7]:

1. Integration of interactive methods, technologies, and problem-based teaching. Through interactive methods, students are actively involved in problematic situations. For example, the integrated use of STEM and TRIZ technologies effectively develops students’ educational-cognitive activity. This approach comprehensively forms students’ mathematical, algorithmic, and engineering thinking and prepares them to solve modern engineering problems.

2. Harmony of problem-based learning and project work. Depending on the problematic situation, the assigned tasks are implemented more deeply through project activity. In this process, students combine theoretical knowledge with practice. As a result, knowledge is strengthened and professional skills are formed.

3. Use of digital technologies. Digital technologies serve as an important part of the integrated approach. Students have the opportunity to use virtual laboratories, simulations, and online platforms in order to study complex technical processes visually.

4. Organization of independent learning. The integrated approach serves to develop students’ independent learning skills. In the process of independently completing the assigned tasks, students learn to search for information, analyze it, and draw conclusions.

The integrated approach serves to increase students’ motivation in the educational process, ensure effective mastery of knowledge, develop the ability for

independent thinking, and form professional skills. It also transforms students from passive listeners into active participants and has a positive effect on improving the quality of education.

In this study, the integrative approach developed for higher education institutions in the technical field is based on the harmony of modern pedagogical ideas. By systematically organizing the educational process, it serves to effectively develop the learning activity of future engineer-technologists.

## **CONCLUSION**

In conclusion, organizing the educational process in higher education institutions on the basis of modern approaches is of great importance in shaping students as independent-thinking, creative, and competitive specialists.

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