

**IMPROVEMENT OF A METHODOLOGICAL SYSTEM FOR DEVELOPING
CRITICAL THINKING IN TEACHING PHYSICS BASED ON A COMPETENCY-
BASED APPROACH**

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This article analyzes the issues of developing students' critical thinking in teaching physics based on a competency-based approach. The importance of forming competencies in the modern education system is substantiated. A system of methods aimed at developing critical thinking in physics education is proposed, and its structural components are described. Furthermore, the effectiveness of the proposed methodological system is scientifically justified.

In the modern education system, priority is given not to the transmission of knowledge, but to the formation of the ability to apply knowledge in practical activities. From this perspective, the competency-based approach has become the main methodological direction of the educational process. This approach is particularly relevant in teaching physics, as it ensures that students not only acquire theoretical knowledge but also apply it in real-life situations.

At the same time, the development of critical thinking has become a central focus of modern pedagogical research. However, in practice, critical thinking is often formed through

separate methods. In this article, it is interpreted as an internal mechanism of competency-based activity, meaning that thinking is not separated from activity but emerges and develops precisely within it.

The competency-based approach interprets educational outcomes as a complex integrative system in which knowledge, skills, motivation, and reflection are formed in interconnection. Within this approach, the learner is not a passive recipient but an active subject. It is precisely the presence of activity that ensures deep understanding of knowledge and its application in practice. Critical thinking cannot be separated from this system, as it acts as an internal mechanism of analyzing, comparing, and evaluating knowledge. Therefore, in this study, critical thinking is considered not as an independent skill but as a key cognitive mechanism that ensures the implementation of competency-based activity.

According to activity theory, the process of cognition occurs not as a result of external influences, but through the active participation of the subject. Physics education is unique in this regard, as knowledge is formed through experimentation, observation, and analysis. The process of understanding a physical phenomenon naturally generates questions, which in turn create a problem situation. Wherever a problem exists, the thinking process becomes activated.

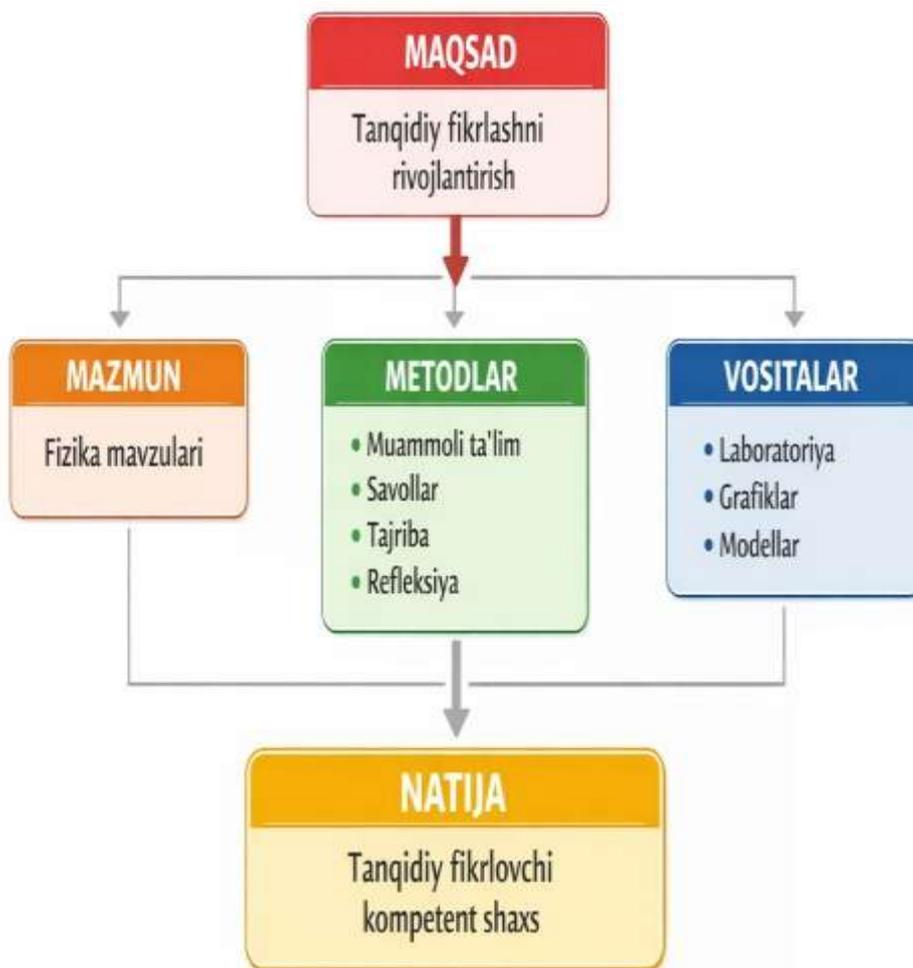
Thus, critical thinking in physics education manifests itself as a continuous process: encountering a phenomenon leads to the emergence of a problem, the problem requires analysis, analysis leads to the formulation of a hypothesis, and the hypothesis is tested through experiment or logical reasoning. At the final stage, reflection occurs, where the learner evaluates their own activity and draws conclusions.

As this process is repeated, stable competencies are formed in learners. Therefore, it is appropriate to interpret competency not as a simple combination of knowledge and skills, but as an integration of thinking, activity, and reflection.

Within this theoretical framework, the developed methodological system assumes that critical thinking is not formed through isolated methods, but through the internal dynamics of activity. The central element of this system is the problem situation, as it is the problem that initiates thinking.

During the activity, the learner conducts experiments, observes, analyzes, and evaluates results. Reflection completes this process, deepening and systematizing knowledge.

Tanqidiy fikrlashni rivojlantiruvchi kompetensiyaviy metodik tizim



The development of critical thinking in teaching physics based on a competency-based approach is an important factor in improving the effectiveness of education. In this study, critical thinking is substantiated not as a separate method, but as an internal mechanism of competency-based activity. The proposed theoretical approach and model contribute to the development of students' independent thinking and the formation of their scientific worldview.

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