

The Current State of Developing the Logical Thinking of Future Teachers in The Higher Education System

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Abstract: Today, when discussing the quality of the system for training future teachers in higher education, special emphasis should be placed primarily on students' professional thinking, their ability to analyze pedagogical situations, and their decision-making competencies based on various situations. The process of logical thinking serves as the primary factor in forming these practical skills in students. Based on current curricula, the process of logical thinking depends not only on the "Philosophy" subject but also on the content, quality, and methodological support of the full curriculum, corresponding subject programs, independent study sessions, a model assessment system, "4+2" pedagogical practice, and qualification practice.

Keywords: Logical thinking, educational processes, curricula, practical programs, specialized subjects, general subjects.

Introduction: In the current era of fundamental reforms in all spheres, including the education system in New Uzbekistan, an approach based on modern and relevant competencies, the measurement of effectiveness in the education system using international criteria, and the development of professional standards for teaching demonstrate the need to improve students' logical thinking and critical thinking skills. However, practical processes show that this process is currently not being given sufficient attention. For example, the formation of students' logical thinking and critical thinking is largely limited to the application of theoretical knowledge, tests, and existing methodologies.

As a result, this causes certain problems in the future pedagogical activities of students, their communication with students, and the resolution of various problem situations. This is precisely why, in order to prevent the aforementioned problems, it is necessary to critically review the curriculum, curriculum, subject program, and methodological support, as well as practical processes in higher education. "In this analysis, international approaches, particularly the integration of high cognitive levels (analysis, synthesis, assessment)

into educational outcomes within Bloom's taxonomy, and theoretical foundations such as ensuring goal-content-evaluation harmony through constructive alignment, serve as an important methodological basis." Based on this, it is necessary to conduct analytical monitoring of educational process documents. "Also, the UNESCO recommendations for teacher training and the competency-based approach developed in the European higher education space emphasize the future teacher's culture of thinking, argumentation, and reflection skills."

The current state of the formation and development of logical thinking in higher education students is primarily determined by the inclusion of academic hours in curricula that serve the logical thinking of future teachers. Curricula prepared for the pedagogical directions of modern pedagogical universities typically consist of general professional and specialized disciplines, pedagogical-psychological blocks, methodological disciplines, and types of practice. Subjects serving the formation and development of logical thinking include "Logic," "Philosophy," "Methodology of Scientific Research," and other similar

disciplines.

"Logic," which was previously taught in many undergraduate programs, is no longer taught as a separate mandatory subject and is integrated into the "Philosophy" subject in the form of an abbreviated module. It can be seen that logical concepts are not systematically, but piece by piece. Analysis of the curricula shows that courses directly serving logical thinking are limited in terms of credit-module volume, with the main emphasis being placed on mastering the content of the specialty. This situation leads to the understanding of logical thinking as a "specific scientific task," whereas it is a transversal competence that must be consistently developed across all disciplines and types of practice. According to the theory of constructive correspondence, if learning outcomes are not expressed through verbs that require logical actions, the content and assessment will also naturally take on a reproductive character. Therefore, it is necessary to include and strengthen mastery indicators that include logical thinking in existing curricula.

When examining the curriculum, standard curriculum, and working curricula, it becomes clear that there is a need to express them in the form of competencies that must be formed as a result of modern educational opportunities. However, the educational content that serves to form these competencies is limited to ordinary (general) content. In particular, expressions such as "can analyze," "think independently," and "draw conclusions" are frequently encountered in the literature; however, what is important is that it is not clearly disclosed which types of activities and levels of logical thinking (comparison, classification, cause-and-effect justification, induction-deduction, etc.) these competencies arise from. "Bloom's taxonomy emphasizes that for the formation of high-level cognitive skills, educational tasks should be oriented toward activities such as problem situations, argumentation, analysis of opposing positions, and evaluation of evidence." Nevertheless, in a number of curricula, work programs, and training programs, the titles of topics allocated for seminars or practical sessions merely repeat the topics presented in the lecture section. Independent study hours are mainly based on traditional methods such as preparing presentations, abstracts, and lecture texts. As a result, "reflective writing," "argumentation maps" - argument

mapping, "debate," "case study," "problem-based learning," "project activity" and other modern methods and tools, which are important in the development of logical thinking, eliminate the possibility of applying them in practice.

Currently, teaching methods and assessment practice occupy a special place in assessing the current state of logical thinking development within the real classroom process in higher education. In the widespread traditional approach, a lecture is organized in the form of a central presentation, while a seminar or practical session is organized in the form of a repetition of theoretical knowledge. The student's thinking process is often focused on finding the "correct answer," and often questions such as "why is that?" and "what evidence is there?" remain secondary. "Research on critical thinking shows that to develop logical thinking, a teacher should regularly use activities such as question-based strategies, Socratic conversation, working with arguments and counterarguments, identifying incorrect conclusions, and analyzing errors."

In contrast, if student assessment is conducted through a testing system, students focus on the importance of knowing only the answer rather than mastering thinking methods. "The reading literacy and problem-solving approach in the PISA concept also indicates the need to evaluate logical thinking through contextual tasks, real-life problems, and evidence-based solutions." Since student assessment processes in the higher education system are primarily based on recalling facts, increasing the level of students' logical thinking will always remain an "unattainable" competence. Because if it is not evaluated, then it is not taught. If it is not taught, then it will not play an important role in the curriculum and business programs.

From this perspective, the current state of developing logical thinking in the higher education system is directly related not only to the content of the educational process but also to its organizational forms and management mechanisms. In particular, within the credit-module system, the increase in the amount of time allocated to students' independent learning was expected to create broad opportunities for the development of logical thinking skills. However, in practice, these opportunities are not being fully realized. Independent learning is often limited to preparing essays, rewriting information, or creating

presentations. As a result, instead of deepening students' creative and analytical thinking processes, it merely forms the ability to reproduce existing information. In addition, pedagogical practice plays an important role in the development of logical thinking. Within the "4+2" system, students are introduced to real educational environments; however, in many cases, they remain in the role of observers or performers. They are not fully engaged in formulating problems, analyzing them, and developing alternative solutions. Consequently, the practice process, instead of ensuring the integration of theory and practice, further widens the gap between them.

Another important factor in the development of logical thinking is the methodological competence of the teacher. A modern educator should not only be a transmitter of knowledge but also a facilitator who guides thinking processes, poses meaningful questions, and creates problem-based situations. However, in current practice, many teachers still find it difficult to move away from traditional approaches. The delivery of ready-made information during lessons often takes precedence, while insufficient attention is given to encouraging students' independent thinking. This, in turn, slows down the natural development of logical thinking skills.

At the same time, the integration of digital technologies into education is creating new opportunities for enhancing logical thinking. Interactive platforms, virtual laboratories, online simulations, and artificial intelligence-based learning systems can contribute to the development of students' abilities to analyze, compare, and draw conclusions independently. However, these technologies are often used merely as tools for information delivery. Their potential as interactive methodological instruments for developing logical thinking has not yet been fully realized.

Another significant issue is the involvement of students in research activities within higher education institutions, which plays an essential role in fostering logical thinking. Engaging students in small-scale research projects, academic writing, and problem-based inquiry significantly strengthens their analytical thinking skills. Unfortunately, in practice, research activities are mostly limited to senior students and remain insufficiently systematic, which prevents comprehensive development.

Furthermore, improving the assessment system is one of the most urgent tasks. In the absence of clearly defined assessment criteria aimed at developing logical thinking, the process of evaluating and enhancing students' thinking abilities remains subjective. Therefore, it is necessary to widely implement rubric-based assessment, analytical assignments, case study analysis, and open-ended questioning systems. Such an approach focuses not only on students' knowledge of outcomes but also on their understanding of processes.

In conclusion, the development of future teachers' logical thinking within the higher education system remains one of the most important pedagogical challenges of today. The analysis of the current situation shows that logical thinking is primarily recognized at a theoretical level, but it is not being developed in a systematic and consistent manner in practice. To address this issue, it is necessary to revise curricula and programs, modernize methodological approaches, improve assessment systems, and enhance the professional competencies of teachers.

At the same time, logical thinking should not be considered only within a separate subject or module but rather as a transversal competence embedded throughout the entire educational process. Only then will future teachers be formed not only as knowledgeable specialists but also as professionals capable of critical thinking, problem analysis, and making well-founded decisions.

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