



Development Of Students' Critical Thinking Through Digital Educational Technologies In Higher Education

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Abstract

The article examines the theoretical and pedagogical potential of developing students' critical thinking through digital educational technologies in higher education institutions. The relevance of the study is determined by the rapid development of the digital educational environment, the increasing volume of information available to modern students, and the active integration of electronic educational resources, interactive platforms, digital services, and artificial intelligence technologies into the educational process.

Keywords: Critical thinking; students; higher education; digital educational environment; digital educational technologies; digital literacy; information literacy; artificial intelligence; problem-based learning; research activity; reflection; professional competence.

The current stage of higher education development is characterized by profound changes associated with the digital transformation of society, the economy, science, and educational activities. The development of information and communication technologies, the expansion of electronic educational resources, the spread of distance and blended learning formats, the use of digital platforms, and the emergence of generative artificial intelligence have significantly changed the conditions for acquiring, transmitting, and processing



knowledge. A student of a modern higher education institution operates in an information environment that is fundamentally different from that in which previous generations were educated. Whereas previously the main sources of systematized knowledge were the teacher, the textbook, and the library, today students have virtually unlimited access to a wide variety of digital resources.

The expansion of information opportunities is an important advantage of the digitalization of education. However, the availability of information in itself does not imply the development of the ability to use it effectively in educational and professional activities. Modern students face not only a large volume of information but also the need to independently determine its quality, reliability, relevance, and correspondence to the problem at hand. In the digital space, scientifically substantiated information, popular interpretations, unverified messages, advertising materials, subjective assessments, and automatically generated content may coexist simultaneously. Therefore, modern education should develop in individuals not only information competence but also the ability to interact critically with information.

The development of students' critical thinking becomes particularly important under these conditions. This ability is associated with the capacity to analyze the content of information, establish logical relationships, compare different positions, evaluate arguments and evidence, identify contradictions, formulate one's own conclusions, and recognize the grounds for decisions being made. Critical thinking presupposes an active position of the individual toward knowledge and information. A student should not act merely as a recipient of ready-made knowledge. Rather, the student should become a subject of cognitive activity, capable of independently investigating a problem, asking questions, seeking evidence, verifying sources, and substantiating their own position. For the higher education system of the Republic of Uzbekistan, the development of such qualities is of particular importance due to the ongoing modernization of the education system, the focus on improving the quality of personnel training, developing professional competencies, and integrating modern educational technologies.



The Concept for the Development of the Higher Education System of the Republic of Uzbekistan until 2030 emphasizes the need to improve the content of higher education, introduce advanced educational technologies, and orient personnel training toward the contemporary requirements of society and the economy [1]. In this context, students' ability to work independently with information and make well-founded decisions constitutes an important component of their future professional competence. The competency-based approach, which has become widespread in the modern higher education system, implies a transition from a predominant focus on the accumulation of theoretical knowledge to the development of the ability to apply knowledge in practical situations. Such a transformation is directly related to the development of critical thinking. The professional activity of a graduate almost always involves situations of uncertainty, the need to choose between several alternatives, the analysis of various sources, risk assessment, and independent decision-making.

Consequently, higher education should create conditions for the development of intellectual mechanisms that enable students to act successfully in such situations. Critical thinking is a complex construct that cannot be reduced to a single intellectual skill. Its structure integrates the processes of analysis, synthesis, evaluation, interpretation, argumentation, and reflection. The analytical component provides the ability to divide complex information into meaningful elements, establish relationships between them, and determine the structure of a problem. The evaluative component enables the assessment of the reliability of information and the validity of various claims. The argumentative component ensures the ability to formulate and defend one's own position. The problem-solving component is associated with searching for and selecting a solution in situations of uncertainty. The reflective component enables students to become aware of their own reasoning processes, identify errors, and correct initial conclusions. Of particular importance is the fact that critical thinking involves not the rejection of information but its meaningful verification. A critically thinking student is not required to reject a new claim merely because it differs from their initial understanding. On the contrary, the



student should be prepared to consider different positions, determine the grounds underlying each of them, compare the evidence, and only then form their own well-founded judgment. Thus, critical thinking presupposes intellectual openness, independence, and responsibility for decisions made. In the pedagogical process, the development of critical thinking is closely related to the nature of learning tasks. A task that requires the reproduction of a definition makes it possible to assess the acquisition of information but does not always create conditions for the formation of independent analysis. Tasks in which students are asked to compare several positions, determine the most convincing one, identify contradictions, verify the reliability of sources, or propose several ways of solving a problem have a fundamentally different character. It is precisely these types of activities that stimulate the activation of higher-order cognitive processes.

The digital educational environment provides broad opportunities for organizing such types of activities. Modern digital resources make it possible to create interactive tasks, virtual situations, electronic cases, digital projects, discussion platforms, collaborative documents, online testing with detailed feedback, and various forms of independent research work. At the same time, the digital format can provide not only the acquisition of information but also its transformation by the student.

An important advantage of the digital educational environment is the opportunity to present a single problem to students through several information sources. For example, when studying a pedagogical or psychological problem, a student may receive a scientific article, statistical data, an interview fragment, materials from an Internet resource, and a result generated by artificial intelligence. The learner's task is not simply to read these materials but to identify differences between them, determine the degree of their reliability, identify contradictions, and formulate their own conclusion.

Problem-based learning is also of great importance. The essence of the problem-based approach lies in creating a cognitive situation in which a student encounters a question requiring an independent search for a solution. Digital



technologies expand the possibilities of such learning because they make it possible to quickly provide the necessary materials, model situations, and organize collective discussion.

Instead of the traditional task “Give a definition of critical thinking,” students can be presented with the problem: “Can information be considered reliable simply because it is published on the Internet?” To answer this question, it is necessary to examine various sources, determine the criteria of reliability, provide examples, and formulate an evidence-based conclusion. As a result, the student performs considerably more intellectual operations than when simply reproducing a definition. Another significant means is digital discussion. Discussion enables students not only to express their own opinions but also to become familiar with alternative positions. When properly organized pedagogically, it becomes a means of developing the argumentative and evaluative components of critical thinking.

A digital discussion can be structured according to a specific sequence: the student’s initial position — argumentation — familiarization with alternative positions — identification of counterarguments — reassessment of one’s own position — formulation of a final conclusion. Such a structure is particularly valuable because it gives students the opportunity to recognize the limitations of their initial understanding and, when necessary, to modify it.

Thus, the development of students’ critical thinking in a digital educational environment can be presented as a sequential process:

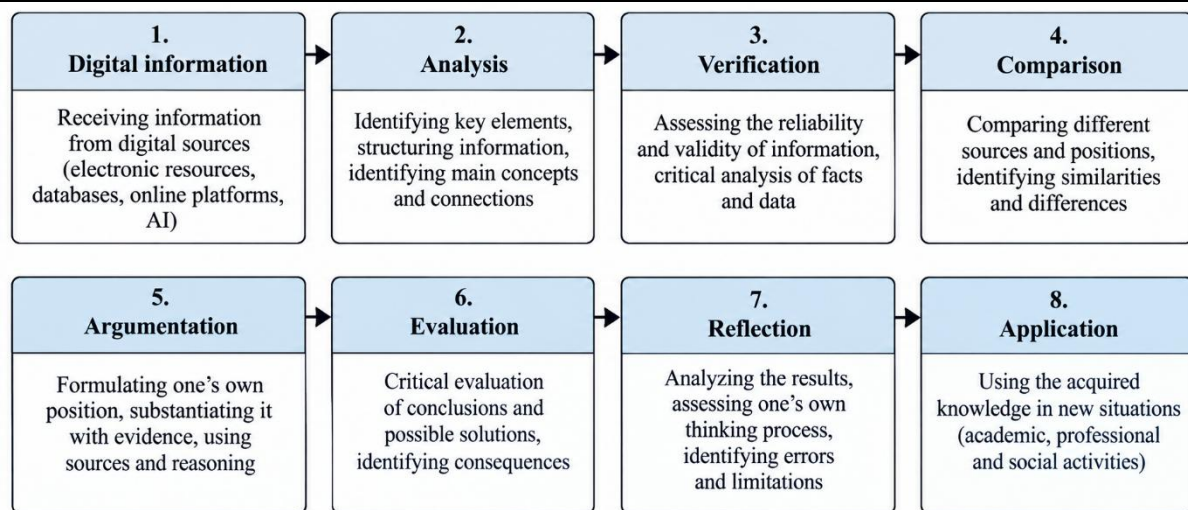


Figure 1 – Sequential Process of Developing Students' Critical Thinking in a Digital Educational Environment

At the first stage, the student receives digital information. At the second stage, the student analyzes and structures it. At the third stage, the student verifies its reliability. Subsequently, the student compares different sources and positions. After that, the student formulates an evidence-based opinion, evaluates its validity, and engages in reflection. The process concludes with the application of the resulting conclusion in a new situation.

The application of this approach in the training of future teachers is particularly important. Teaching activities require continuous analysis of situations, understanding the individual characteristics of learners, evaluation of educational outcomes, selection of teaching methods, and decision-making. Therefore, critical thinking is not only a general academic quality but also an important component of the professional competence of a future specialist.

A future teacher should be able to analyze pedagogical information, critically evaluate educational technologies, compare different methodological approaches, identify the effectiveness of pedagogical decisions, and adapt them to a specific educational situation. The use of digital technologies in the process of professional training can create conditions for developing these qualities.



References:

1. UNESCO. Guidance for Generative AI in Education and Research. — Paris: UNESCO, 2023.
2. Андруэччи-Аннунциата П., Ридеманн А., Кортес С. и др. Conceptualizations and instructional strategies on critical thinking in higher education: A systematic review of systematic reviews // *Frontiers in Education*. — 2023. — Vol. 8.
3. Beghetto R. A., Karwowski M. Toward a More Dynamic Understanding of Creativity in Education // *Educational Psychology Review*. — 2019. — Vol. 31. — P. 1–18.
4. Милиева, Муаттар. "Формирование мотивационной сферы студентов." *Наука и инновации* 1.1 (2024): 256-257.
5. Milieva, M. G. "About psycholinguistics and neurolinguistics of bilingualism." *Issues of Science and Education* 8 (2018): 20.
6. Milieva, Muattar Gaffarovna. "Increasing Students' Learning Motivation: A Comprehensive Approach." *American Journal Of Social Sciences And Humanity Research* 5.05 (2025): 92-94.
7. Милиева, Муаттар. "Talabalarda xorijiy tillarni o'rganishdagi motivatsiya va qobiliyatlari." *Наука и инновации* 1.1 (2024): 306-308.
8. Milieva, Muattar Gaffarovna. "General characteristics of training as a multifunctional method." *Academic research in educational sciences* 4.TMA Conference (2023): 762-767.
9. Gaffarovna, Miliyeva Muattar. "Xorijiy tillarni o'zlashtirish ko'nikmasi shaklanishining o'ziga xos xususiyatlari." *O'zbekiston davlat jahon tillari universiteti konferensiyalari* (2025): 508-513.
10. Халмуратова, Мухтарам Ульмасовна, and Муаттар Гаффаровна Милиева. "Психолого-педагогические условия развития творческого мышления младших школьников." *O'zbekiston davlat jahon tillari universiteti konferensiyalari* (2025): 529-532.
11. Абиева, Юлдуз Абдумуталовна, and Муаттар Гаффаровна Милиева. "Экономическое воспитание детей в семье: теоретические основы и



- практическая значимость." O'zbekiston davlat jahon tillari universiteti konferensiyalari (2025): 533-536.
- 12.Макимова, Гульбану Толеуовна, and Муаттар Гаффаровна Милиева. "Компоненты способностей к иностранному языку." O'zbekiston davlat jahon tillari universiteti konferensiyalari (2025): 514-519.
- 13.Милиева, М. Г. "Психолингвистика как метод изучения стратегий и тактик речевого воздействия." O'zbekiston davlat jahon tillari universiteti konferensiyalari (2025): 416-422.
- 14.Milieva, Muattar Gaffarovna. "Teaching Methods in Learning Foreign Languages and Developing Communication Skills." Journal of Social Sciences and Humanities Research Fundamentals 5.05 (2025): 99-102.
- 15.Милиева, Муаттар Гаффаровна. "Взаимоотношения психолингвистики и лингвистики." O'zbekiston davlat jahon tillari universiteti konferensiyalari (2025): 421-425.
- 16.Gaffarovna, Miliyeva Muattar. "Xorijiy til qobiliyatlari tuzilishining umumulashtirilgan ko 'rinishi." O'zbekiston davlat jahon tillari universiteti konferensiyalari (2025): 321-324.
- 17.Miliyeva, M. G. "Xorijiy tillarni o 'zlashtirgan talabalarning kommunikativ kompetensiyasining tarkibiy qismlari." Inter education & global study 3.5 (1) (2025): 464-470.
- 18.Gaffarovna, Milieva Muattar, and Boymurodova Feruza Ziyod Kizi. "A collaborative capacity for generating ideas in the writing classroom." Проблемы педагогики 6 (45) (2019): 15-17.
- 19.Milieva, Muattar Gaffarovna, and F. Z. Boymurodova. "Up-to-date methods of using internet in teaching languages." european research: innovation in science, education and technology. 2019.
- 20.Милиева, М. Г. "Типология мотивов овладения иностранным языком." вестник интегративной психологии: 193.
- 21.Milieva, Muattar Gaffarovna. "Conditions for Successful Monitoring of The Quality of Training and Education." Journal of Social Sciences and Humanities Research Fundamentals 5.05 (2025): 10-13.