

The Development of the Thinking Culture of the Students in Pre-Higher and Higher Education in a Digital Education Environment: a Psychodiagnostic Assessment

Bihunova S.^{a1}, Verovkina O.^a

^a Rivne State University of the Humanities, Ukraine

Article type: Research article

Abstract

The article explores the development of students' thinking culture within the context of a digital educational environment in professional pre-higher and higher education. The study provides a theoretical interpretation of the concepts of the digital educational environment and students' thinking culture and clarifies their structural characteristics. The digital educational environment is viewed as a complex educational system that integrates electronic learning resources, distance learning courses, digital technologies, professional communities, individualized learning, blended learning, and active teaching methods. Students' thinking culture is conceptualized as a multidimensional structure that includes motivational, cognitive, and social domains, each comprising meaningful, operational, and personal-value components. The study presents the results of a psychodiagnostic assessment of the level of development of students' thinking culture under conditions of digital learning. The findings demonstrate positive changes primarily in the motivational and cognitive domains, including increased achievement motivation, development of creative thinking, personal and intellectual reflection, and improved abilities for self-regulation and self-management. At the same time, communicative competencies, particularly public speaking skills, showed no significant improvement, which indicates certain limitations of learning exclusively within digital educational environments. The results highlight the potential of digital educational environments for fostering intellectual and personal development while emphasizing the importance of improving pedagogical strategies that support the development of students' communicative and social competencies.

Keywords: digital educational environment; thinking culture; psychodiagnostics; digital learning; cognitive development.

Розвиток мисленнєвої культури здобувачів фахової передвищої та вищої освіти в умовах цифрового освітнього середовища: психодіагностичний вимір

Бігунова С.^{a1}, Верьовкіна О.^a

^a Рівненський державний гуманітарний університет, Україна

Анотація

Стаття присвячена дослідженню розвитку мисленнєвої культури здобувачів фахової передвищої та вищої освіти в умовах цифрового освітнього середовища. У роботі здійснено теоретичне узагальнення понять «цифрове освітнє середовище» та «мисленнєва культура здобувачів освіти», визначено їх змістові характеристики та структурні компоненти. Показано, що цифрове освітнє середовище включає електронні освітні ресурси, дистанційні курси, цифрові технології, професійні спільноти, індивідуалізоване та змішане навчання, а також активні методи освітньої взаємодії. Мисленнєва культура здобувачів освіти розглядається як багаторівнева структура, що охоплює мотиваційну, когнітивну та соціальну сфери, кожна з яких містить змістовий, операційний і особистісно-смісловий компоненти. Представлено результати психодіагностичного дослідження рівня розвитку мисленнєвої культури здобувачів освіти в умовах цифрового освітнього середовища. Встановлено позитивну динаміку показників мотиваційної та когнітивної сфер, зокрема зростання мотивації досягнення, розвитку творчого мислення, особистісної та інтелектуальної рефлексії, здатності до саморегуляції та самоуправління. Водночас у сфері комунікативних умінь, зокрема ораторських здібностей, істотних змін не виявлено, що свідчить про необхідність подальшого вдосконалення освітніх практик у цифровому середовищі. Отримані результати можуть бути використані для подальших досліджень у галузі розвитку інтелектуальної культури та ментального потенціалу здобувачів освіти.

Ключові слова: цифрове освітнє середовище; мисленнєва культура здобувачів освіти; психодіагностика; експеримент; розвиток мислення.

¹ Corresponding author

E-mail address: svitozara.bihunova@rshu.edu.ua

ORCID: Bihunova <https://orcid.org/0000-0001-6860-6939>

Verovkina <https://orcid.org/0000-0002-1333-6668>

<https://doi.org/10.37203/kibit.2026.54.02>

How to cite this article: Bihunova S., Verovkina O. (2026). The development of the thinking culture of the students in pre-higher and higher education in a digital education environment: a psychodiagnostic assessment. *Herald of Kyiv Institute of Business and Technology*, 54(1), 13-18. <https://doi.org/10.37203/kibit.2026.54.02>

© 2026 The Author(s). This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0).

Introduction

In the context of the development of modern higher pre-university and higher education, the problem of forming the thinking culture is becoming increasingly important. After all, the globalization of social, economic, and cultural processes, as well as Ukraine's joining the global and information space, highlight the need to educate and raise a generation that will have a high level of ability to think, obtain and process information, analyze situations, and adequately assess the results of their activities. Similarly, the ability to express one's thoughts in a way that is understandable to others and to interact constructively with others in a digital environment are of equal importance.

In psychology, thinking (or in some studies) intellectual culture is considered a component of an individual's psychological culture (H. Bal, M. Boryshevskyi, V. Moliako, N. Mykchalchuk, M. Smulson). Scientific findings indicate that a person with a high level of intellectual development is characterized by intelligence, intellectuality, a worldview of positions, ideals, values, humanity, tolerance, and the ability to realise their own views and beliefs in practical activities. Theoretical models of students' thinking culture have been developed in psychological literature. However, the researchers do not have a common view on the impact of the digital educational environment on the thinking culture of students. At the same time, it is the digital educational environment that determines the impact on the development of conceptual thinking (flexibility, divergence, depth, criticality, independence, etc.).

The relevance of this study is determined by the lack of psychological studies on the impact of the digital educational environment on the formation of the thinking culture of students which has determined the choice of the topic of this article.

Thus, *the aim* of the study is to determine how the digital educational environment influences the development of the students' thinking culture in higher and vocational pre-university education.

Methods and materials

The digital educational environment (DEE) is now seen as a complex system of various services, resources, and tools designed to adapt the educational process to the realities and requirements of the digital society. Obviously, it is characterized by multitasking, multi-level and multi-component nature and requires compliance with a number of principles during design and construction as a guarantee of effective functioning (Areshonkov, 2020). It provides an open set of digital information and communication tools designed to support various tasks in the educational process, including organizing interaction between all participants in different modes, providing rapid access to educational information in various formats, automated control of the results of its processing, etc. In this regard, such an environment is characterized by broad functional capabilities, the implementation of which is ensured by adherence to a number of principles in the process of its construction. Among them, the principles of integration, systematicity, modularity, hierarchy, technological saturation, technological openness, and web orientation play a particularly important role (Storonska, 2024).

In regulatory and legislative sources, as well as dictionaries and reference books, one can find isolated definitions of the concept of digital educational environment, as this is a modern definition that has become widely used in recent decades. In particular, the digital environment refers to the digital representation of audio and video data on the World Wide Web and other technologies that can be used to create and distribute digital content (Pivniak 2010).

The digital educational environment is driven by the needs of the digital society and modern students, to have access to the educational process, in particular, teaching and learning materials, in a 24×7 format. We consider the concept of a 'digital educational environment' (DEE) to be defined as follows: it is an artificially created educational environment in which the didactic goals of learning, cooperation and communication among participants in the educational process are achieved through the balanced and appropriate use of digital technologies. It should be pointed out that the digital educational environment should support the comprehensive development of all participants in the

educational process, where the educational program for the professional training of students is successfully implemented.

According to the classification DEE embraces the following list:

- a) electronic educational resources: video libraries, audiobooks, electronic textbooks;
- b) distance learning courses: webinars, conferences, chats, master classes;
- c) professional communities: blogs, websites, YouTube channel. portfolio-CV;
- d) document flow: monitoring and control of knowledge, regulatory and legal framework;
- e) individual training: group training (including small groups), collective training;
- f) blended learning: distance learning, traditional learning, asynchronous learning, mobile learning;
- g) active teaching methods: games, dialogue, integration, training, practical exercises (Pavlova, 2024).

At this stage of the study, we will examine the structure of an individual's thinking culture. According to the studies, thinking culture is considered to be a combination of motivational, cognitive, and social spheres of the personality, which in turn contain content, operational, and personal-meaningful layers (Verovkina, 2010, 2025; Mychalchuk, 2025, 2024).

These layers contain their components. For instance, the content layer of the motivational sphere includes the component “positive motives that contribute to the development of thinking culture”, while the operational layer of this sphere includes the component “achievement motivation”. The content layer of a cognitive sphere consists of the components “digital skills and abilities” and “acquiring creative activity experience”. The operational layer consists of the following components: “creative thinking indicators”, “creative abilities”, “mental operations”, while the personal-semantic layer of the cognitive sphere consists of the components “intellectual reflection” and “personal reflection” (Park, 2023; Peng, 2025; Rawlings, 2024; Sari, 2024; Shaber, 2025)

The content layer of the social sphere includes the following components: “personally significant qualities”, “public speaking skills”; the operational layer embraces “ability to self-regulate socially” and “ability to self-manage”; the personal-semantic layer includes “satisfaction with learning in a digital environment” and “development of empathy”.

Results

The next stage of this study was to conduct a formative (descriptive) section, which aimed to prove that the development of students' thinking culture occurs more intensively in a digital educational environment. Sixty students from a vocational college and university participated in the observational study and were divided into control and experimental groups. The descriptive section of the experiment consisted of three stages. At the first stage, the goal was to analyze the level of development of the motivational sphere of students' thinking culture. The survey results showed that most students (83.7% in E1, 85.2% in K1) do not accurately understand or do not understand at all the essence of the category “thinking culture”, identifying it either with thinking or with intelligence. Quite a lot of students (34.8% in E1, 39.8% in K1, 32.4) showed an average level of achievement motivation.

The second stage of the diagnostic assessment covered the diagnosis of the level of development of the cognitive sphere of students' thinking culture (Dwyer, 2025; Ersoy, 2026; Liu, 2023). In this regard, the level of digital skills, experience in creative activities, etc. was assessed. The lowest results were obtained by the students in the experimental and control groups in terms of diagnostic abilities (the average score for a high level of development in E1 is 10.7%, in K1 – 10.6%). This indicates that students lack self-education skills and are unable to independently master educational information at a creative level. Quite low results were obtained for “constructive skills”. Based on this, it was concluded that without a specially organized digital environment, students are unable to independently select, analyze, and synthesize educational material. During the assessment of the operational layer of the cognitive sphere of students' thinking culture, the qualitative characteristics of students' creative thinking in the traditional process of their educational and

cognitive activities were diagnosed. The diagnostic method was based on the individual's ability to think divergently (according to D. Guilford). The diagnostic data allowed us to come to the following conclusions. The most developed skill among the students is the ability to put forward hypotheses and unusual ideas, as evidenced by the indicators for the "originality" factor. Less pronounced is the ability of the student to transfer knowledge and skills to new situations and isolate specific aspects of a problem, which indicates a low level of "flexibility of thinking". The data on the components of personal reflection indicate the student's inability to analyze and understand their mental state, as well as to understand their desires and dreams.

The third stage of the descriptive section was aimed at identifying the level of development of the social sphere of students' thinking culture. It should be noted that although "responsibility" occupies one of the most significant places in students' self-assessment and expert assessment, these results still differ significantly in percentage terms. Students gave the lowest percentages to qualities such as "originality", "ability to predict" and "tolerance in communication". Low results were also obtained for the public speaking skills of students in the experimental and control groups. The students find it difficult to express their point of view, which indicates the underdevelopment of the content layer of the social sphere of students' thinking culture. When diagnosing the ability to self-manage, we meant the ability of a person to control their own thoughts and actions. The presence of self-management abilities characterizes a person as strong and strong-willed, with a high level of personal activity. The results obtained from the social self-regulation test show that 36.95% of students in group E1 and 37.14% in group K1 are inattentive, unrestrained, and unable to concentrate. Such students have no experience of positive communication.

To sum it up, the diagnosis of students' thinking culture revealed low scores in the content, operational, and personal-meaning layers of the motivational, cognitive, and social spheres of the phenomenon under study. Practically all the students were unable to combine learning with the process of self-education and self-knowledge. Only a few demonstrated a high level of a few indicators of thinking culture. At the descriptive stage, a comparative analysis was conducted between the control group, which was taught using a traditional approach, and the experimental group, which was taught in DEE. The above conditions and components of the application of the digital educational environment were the key in conducting the experiment. The results are presented in the table.

Table 1

The development of students' thinking culture using the capabilities of the digital educational environment

Spheres of thinking culture	Control Group, descriptive section	Control group, traditional studying	Experimental group, descriptive section	Experimental group, experiment with DEE
Motivational Sphere	85.2%	83.7%	85, 9%	89,9%
Cognitive Sphere	10,7%	10, 8%	10,6%	11,46%
Social sphere	37,14%	37,2%	36,96%	38%

It should be noted that not all the components of students' thinking culture developed evenly after the experimental implementation. For example, public speaking skills, which belong to the social sphere of the thinking culture, were not significantly improved. However, the components of the motivational and cognitive spheres have increased significantly.

Conclusion

All things considered, the paper presents a theoretical generalization of the digital educational environment and clarifies the content of students' thinking culture. The latter is considered as a model combining motivational, cognitive, and social spheres, which in turn has content, operational, and personal-meaning layers.

Based on the generalization of data obtained in the formative experiment, it was determined that the organization of a digital educational environment contributes to the development of students' thinking culture. It has been proven that learning in a digital educational environment contributes to the development of students' creative abilities, the improvement of their mental operations, personally significant qualities, personal and intellectual reflection, the need for self-actualization, self-management, cognitive activity, etc. This study does not exhaust the issue of developing students' thinking culture. We consider it expedient to further study the psychological prerequisites for effective ways of forming students' thinking culture, not only in the digital educational environment.

Furthermore, prospects for further research in this area relate to the practical aspect of psychology and concern the introduction of new models and research methods in the field of thinking, mental, intellectual culture, as well as the application of new active teaching methods.

REFERENCES

- Areshonkov, V. Yu. (2020). Tsyfrovizatsiia vyshchoi osvity: vyklyky ta vidpovidi: Naukova dopovid na metodolohichnomu seminari NAPN Ukrainy. Shliakhy i mekhanizmy pidvyshchennia konkurentospromozhnosti universytetiv Ukrainy (19.11.2020). *Visnyk NAPN Ukrainy*, 2(2), 1–6. <https://doi.org/10.37472/2707-305X-2020-2-2-13-2>
- Dwyer, C. P., Campbell, D., & Seery, N. (2025). An evaluation of the relationship between critical thinking and creative thinking: Complementary metacognitive processes or strange bedfellows? *Journal of Intelligence*, 13(2), Article 23. <https://doi.org/10.3390/jintelligence13020023>
- Ersoy, E., & Kara, D. Ö. (2026). The effect of the creative problem-solving approach on creative thinking skills. *Frontiers in Psychology*, 17, Article 1734855. <https://doi.org/10.3389/fpsyg.2026.1734855>
- Liu, Z., Yu, H., Feng, M., & Hou, Y. (2023). Thinking styles and creativity: The mediating role of psychological adjustment in college students. *Behavioral Sciences*, 13(10), Article 875. <https://doi.org/10.3390/bs13100875>
- Mykhalchuk, N. O., & Ivashkevych, E. Z. (2024). Compliment as an existence of speech etiquette: Linguistic and cultural aspect. *Naukovi zapysky NU "Ostrozka akademiia". Serii: Filolohiia*, 21, 25–30. [https://doi.org/10.25264/2519-2558-2024-21\(89\)-25-30](https://doi.org/10.25264/2519-2558-2024-21(89)-25-30)
- Mykhalchuk, N., & Komarnitska, L. (2023). The ways of development of students' creative thinking by actualizing their auditory differential sensation. *Problemy suchasnoi psykholohii*, 61, 74–95. <https://doi.org/10.32626/2227-6246.2023-61.74-95>
- Mykhalchuk, N., & Koval, I. (2024). Psychological functions of socio-cultural competence. *Problemy suchasnoi psykholohii*, 63, 219–241. <https://doi.org/10.32626/2227-6246.2024-63.219-241>
- Mykhalchuk, N., Ivashkevych, E., & Chala, Yu. (2024). The problem of professionally significant experience in contemporary psychology. *Psykhologhiia: realnist i perspektyvy*, 22, 69–77. https://doi.org/10.35619/prap_rv.v1i22.368
- Mykhalchuk, N., Ivashkevych, E., & Liashenko, L. (2024). Main linguistic characteristics of the concept PREDICANIVENESS. *Akademichni studii. Serii: Humanitarni nauky*, 1, 100–108. <https://doi.org/10.52726/as.humanities/2024.1.16>
- Mykhalchuk, N., Ivashkevych, E., Gron, L., & Nikolaichuk, H. (2024). Innovative ways of using video resources in developing students' creative thinking during online education in the conditions of war in Ukraine. *Innovatyka u vykhovanni*, 19, 59–69. <https://doi.org/10.35619/iuu.v1i19.598>

- Park, J. H., Li, Y., & Niu, W. (2023). Revisiting creativity and critical thinking through content analysis. *Journal of Creativity*, 33(2), Article 100056. <https://doi.org/10.1016/j.yjoc.2023.100056>
- Pavlova, N. S. (2024). Tsyfrovo osvritnie seredovyshche u konteksti tsyfrovizatsii osvity. In *Scientific Method: Reality and Future Trends of Researching* (Proceedings of the VI Scientific and Theoretical Conference, Zagreb, Croatia). <https://previous.scientia.report/index.php/archive/article/view/1988>
- Peng, Q., Ma, Y., Zhang, L., & Zhou, R. (2025). The impact of brain science literacy on creative thinking: A meta-analytic study. *Frontiers in Education*, 10, Article 1637506. <https://doi.org/10.3389/educ.2025.1637506>
- Pivniak, H. H., Busyhin, B. S., Diviziniuk, M. M., et al. (2010). *Tlumachnyi slovnyk z informatyky*. Natsionalnyi hirnychyi universytet.
- Rawlings, B. S., & Cutting, S. J. (2024). Linking disparate strands: A critical review of the relationship between creativity and education. *Educational Psychology Review*, 36, Article 135. <https://doi.org/10.1007/s10648-024-09973-z>
- Sari, T. N. I., & Rakhmawati, A. (2024). Analysis of the quality of critical thinking and creativity questions in high school biology subjects with the Rasch model. *Research and Development in Education (RaDEn)*, 4(1), 602–616. <https://doi.org/10.22219/raden.v4i1.32758>
- Shaber, N., Shah, S. K., Imran, M., & Almusharraf, N. (2025). Exploring the relationship between critical thinking and creativity in university students: Gender differences and the assessment of skills. *Education Sciences*, 15(4), Article 464. <https://doi.org/10.3390/educsci15040464>
- Storonska, O. S. (2024). Pryntsypy pobudovy suchasnoho tsyfrovoho osvitnoho seredovyshcha. *Akademichni vizii*, 27. <https://academy-vision.org/index.php/av/article/view/779>
- Verovkina, O. Ye. (2010). *Psykhologichni chynnyky formuvannia myslennievoi kultury pidlitkiv* (Doctoral dissertation). Kyiv.
- Verovkina, O., Simko, A., & Zavatska, N. (2025). Psychological ways of the development of different types of thinking of students as their soft skills. *Problemy suchasnoi psykhologii*, 65, 9–30. <https://doi.org/10.32626/2227-6246.2025-65.9-30>