

**OPPORTUNITIES FOR ENHANCING STUDENTS' COGNITIVE ACTIVITY: AN
EXPERIMENTAL STUDY**

***OPORTUNIDADES PARA MELHORAR A ATIVIDADE COGNITIVA DOS ALUNOS:
UM ESTUDO EXPERIMENTAL***

***OPORTUNIDADES PARA MEJORAR LA ACTIVIDAD COGNITIVA DE LOS
ESTUDIANTES: UN ESTUDIO EXPERIMENTAL***



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How to reference this paper:

Panjiev, N., Kotovchikhina, N., Stepanova, D., Saparkyzy, Z., Chikhaeva, K., Kozachek, A., & Akhmetshin, E. (2026). Opportunities for enhancing students' cognitive activity: An experimental study. *Revista on line de Política e Gestão Educacional*, 30, e026042. <https://doi.org/10.22633/rpge.v30i00.21161>



| **Submitted:** 01/10/2025

| **Revisions required:** 22/10/2025

| **Approved:** 29/04/2026

| **Published:** 18/05/2026

Editor: Prof. Dr. Sebastião de Souza Lemes
Deputy Executive Editor: Prof. Dr. José Anderson Santos Cruz

ABSTRACT: Modern higher education requires students not only to acquire professional knowledge but also to develop cognitive activity, research skills, and readiness for self-directed learning. This study examines whether a training program can enhance university students' cognitive activity. The research combines theoretical analysis with a pedagogical experiment involving experimental and control groups. Cognitive activity was assessed through motivational-volitional and procedural-operational components using established psychological and pedagogical diagnostic tools. The results show that students who participated in the training program demonstrated stronger cognitive motivation, success orientation, volitional self-regulation, reflection, and learning ability than students in the control groups. The findings confirm the effectiveness of targeted psychological and pedagogical conditions for activating cognitive activity in higher education and indicate the need to integrate structured training, reflective tasks, and problem-based learning into university practice.

KEYWORDS: Cognitive activity. Activation of cognitive activity. Cognitive engagement. Motivation. Training program.

RESUMO: As instituições de ensino superior devem desenvolver não apenas conhecimentos profissionais, mas também atividade cognitiva, competências de investigação e prontidão para a aprendizagem autônoma. Este estudo analisa se um programa de formação pode melhorar a atividade cognitiva de estudantes universitários. A investigação combina análise teórica e experiência pedagógica com grupos experimental e de controle. A atividade cognitiva foi avaliada por meio dos componentes motivacional-volitivo e processual-operacional, utilizando instrumentos psicológicos e pedagógicos consolidados. Os resultados mostram que os estudantes que participaram do programa apresentaram maior motivação cognitiva, orientação para o sucesso, autorregulação volitiva, reflexão e capacidade de aprendizagem em comparação com o grupo de controle. Os achados confirmam a eficácia de condições psicológicas e pedagógicas direcionadas para ativar a atividade cognitiva no ensino superior.

PALAVRAS-CHAVE: Atividade cognitiva. Ativação da atividade cognitiva. Envolvimento cognitivo. Motivação. Programa de treino.

RESUMEN: Las instituciones de educación superior deben desarrollar no solo conocimientos profesionales, sino también actividad cognitiva, habilidades de investigación y disposición para el aprendizaje autónomo. Este estudio analiza si un programa de formación puede mejorar la actividad cognitiva de estudiantes universitarios. La investigación combina análisis teórico y experimento pedagógico con grupos experimental y de control. La actividad cognitiva se evaluó mediante componentes motivacional-volitivos y procedimental-operacionales, utilizando instrumentos psicológicos y pedagógicos consolidados. Los resultados muestran que los estudiantes que participaron en el programa presentaron mayor motivación cognitiva, orientación al éxito, autorregulación volitiva, reflexión y capacidad de aprendizaje que los estudiantes del grupo de control. Los hallazgos confirman la eficacia de condiciones psicológicas y pedagógicas específicas para activar la actividad cognitiva en la educación superior.

PALABRAS CLAVE: Actividad cognitiva. Activación de la actividad cognitiva. Compromiso cognitivo. Motivación. Programa de entrenamiento.

INTRODUCTION

Contemporary scientific, socio-economic, and technological change has increased the demand for higher education systems to prepare specialists who are competent, socially active, creative, and capable of continuous self-development. Recent studies emphasize that this goal cannot be achieved only through the transmission of professional knowledge; it also requires the development of students' cognitive activity (CA), research skills, and capacity for independent learning (Abdullayev et al., 2024; Alperovich, 2023; Kryucheva & Tolstoukhova, 2023).

In universities, the growing share of independent work makes CA especially important. Students are expected to plan learning tasks, search for information, analyze educational material, and regulate their own progress. However, these abilities do not emerge automatically. They depend on pedagogical organization, motivation, psychological support, and teaching methods that encourage cognitive engagement (Kiselitsa et al., 2024; Shichkin et al., 2024; Togaibayeva et al., 2023).

Therefore, the central problem of this study is how to create psychological and pedagogical conditions that effectively stimulate students' CA in higher education. The article aims to examine the potential of a structured training program for activating CA and to assess its effects on motivational-volitional and procedural-operational components.

LITERATURE REVIEW

The analysis of scientific and theoretical foundations regarding the organization of students' CA and the psychological-pedagogical aspects of its activation demonstrates a profound interest among researchers in this problem (Aziyev et al., 2024). According to Lagunova and Yurchenko (2011), cognitive activity is an essential and critical component of human activity, driving the development of both society and the individual. It is one of the specific forms of human activity.

Gribova (2020) considers an individual's cognitive activity to be a recurrent process involving the interaction of three relatively independent stages: acquisition, incorporation, and operation with knowledge. This process can occur in its complete and perfect form, characterized by sequential and parallel transitions from one stage to another, which is typical of creative activities generating new knowledge. It can also manifest in truncated forms, such as mechanical memorization of perceived material or its sensory imprint (Gribova, 2020).

Researchers conclude that cognitive activity is a deliberate manifestation of an individual's activity aimed at understanding the surrounding reality. It occurs throughout life, across all types of activities and social interactions, and includes motivational-volitional, procedural-operational, and outcome components within its structure. It is realized through cognitive acts of comprehension and reflection (Sitarov & Shinin, 2017).

Buzdalova (2016) views cognitive activity as a process of demonstrating engagement directed toward an object of cognition, leading to the conclusion that an individual's cognitive engagement is an active state manifested in a multifaceted and profound interest in knowledge, the application of effort, focused attention, and the exertion of intellectual and physical capacities to achieve set goals (Fedorovich, 2010).

In studies by Danushenkov (2016), Fialko (2015), and Gabidullina et al. (2023), attention is drawn to the necessity of implementing the developmental function of education in the practice of the learning process, ensuring an optimal balance between the guiding role of the teacher and the independent work of the student as a key component of the activity of educational subjects. Each researcher examining this issue focuses on a specific aspect of cognitive activity.

Nekrasova and Chikova (2021) approach this issue from the perspective of the intra-individual structure of personality, considering activity as a manifestation of the volitional, emotional, and intellectual facets of an individual. Koverets (2020) views it as a unity of activity in which the personality of the learner is expressed through their attitude toward the content and nature of the activity and their willingness to mobilize moral and volitional efforts to achieve educational and cognitive goals. Nikolaev (2015) argues that cognitive activity is a powerful stimulus for shaping a well-rounded personality, with its level depending on the development of enthusiasm within a system of other motives.

Other authors consider cognitive activity from various perspectives: as selective cognitive orientation toward objects and phenomena of the surrounding reality (Bobrova, 2007); as a complex psychological construct representing the unity of an individual's cognitive, emotional, and volitional spheres (Bolgar & Solovyov, 2019); as exploratory activity (Altukhova, 2018); as orientation and research activity (Proskuryakova, 2019); and as a need for impressions (Buzdalova, 2016).

Thus, cognitive activity can be defined as a selective cognitive orientation of an individual toward objects and phenomena, as well as a complex psychological construct that unites the cognitive, emotional, and volitional spheres of the personality.

An essential aspect of studying the problems of activating CA is the recognition of the role of internal factors such as representations, ideas, needs, and interests (Reutova, 2020). Researchers rightly believe that any type of social activity (e.g., labor, cognitive, creative) depends on an individual's needs, attitudes, value orientations, and beliefs, in other words, on the motivational structure of the personality and, consequently, on the motives for activity (Kameneva & Bondarenko, 2018; Ling et al., 2023).

With regard to the motives for academic activity, researchers highlight the following: awareness of immediate and ultimate learning goals; understanding the theoretical and practical significance of knowledge; the emotionality of how educational material is presented; illustrating the developmental prospects of scientific concepts; professional orientation of academic activities; selection of tasks that create problem-based situations within the structure of learning; the presence of curiosity and a “cognitive psychological climate” in the study group (Maksimov & Klykov, 2016). Thus, the awareness of the motives behind academic activity serves as a prerequisite for cognitive activity.

Although the literature describes CA from motivational, volitional, emotional, and operational perspectives, fewer studies experimentally test how a targeted psychological training program can strengthen these components in university students.

This gap justifies the present experimental study, which evaluates a training program designed to activate students' CA and compares changes in experimental and control groups.

METHODS

The experimental study on the activation of students' CA was conducted through a pedagogical experiment.

An analysis and synthesis of theoretical results allowed the identification of criteria used as a foundation for developing diagnostic methods to determine the levels of formation for each component of CA. The following criteria were identified:

1. Motivational-volitional component: the nature of student motivation, the level of cognitive interest, goal-setting ability, and the development of volitional states and traits, such as determination, perseverance, decisiveness, and independence;
2. Procedural-operational component: a high level of adaptability and proficiency in analyzing, comparing, generalizing, and systematizing information.

To evaluate the effectiveness of the training program aimed at activating CA and to determine the level of formation of each CA component, a corresponding study was conducted. The study involved two experimental groups (EG) with a total of 66 students (to test the effectiveness of the developed training program for activating CA) and two control groups (CG) with a total of 61 students (to diagnose the formation levels of CA components).

Research hypotheses:

- H_0 : Empirical distributions of EG and CG students by levels of CA development after the experiment do not differ;
- H_1 : Empirical distributions of EG and CG students by levels of CA development after the experiment differ.

The empirical study followed a three-stage process:

Stage 1: Initial (baseline) experiment.

This phase aimed to establish the initial characteristics and features of CA activation among CG and EG participants. The objective was to gather empirical data to provide a comprehensive understanding of the students' CA development levels. The CG served as a benchmark for comparing EG indicators, which were used to implement the training program designed to activate CA. The program included informational-educational, developmental-corrective (targeting motivational-volitional and procedural-operational spheres), and reflective components.

Stage 2: Formative experiment.

This phase involved conducting a formative experiment within the EG, employing a specifically designed system of developmental interventions. The EG underwent activities outlined in the developed training program for activating CA, with the expectation that this would enhance the students' CA levels.

Stage 3: Final experiment.

In this phase, a second baseline experiment was conducted involving both CG and EG participants. The goal was to collect empirical data after the application of the training program. The CG served as a reference point for comparison with the EG to assess changes in the development levels of CA components. The results of this phase determined whether the research hypothesis was confirmed.

The empirical procedure used a mixed diagnostic battery: surveys, psychological testing, observation, interviews, and analysis of independent assessments. These methods were selected to capture both subjective indicators of motivation and observable educational behavior.

To study the motivational-volitional component, the following tools were employed:

V. K. Gerbachevsky's "Assessment of Achievement Aspiration Level" was used to determine the position of cognitive motivation within the student's overall motivational structure. The instrument was relevant to the university sample because it measures achievement-related motives directly connected with learning goals and academic effort (Raigorodsky, 2011).

A. Rean's "Motivation for Success and Fear of Failure" questionnaire was included to distinguish a constructive orientation toward achievement from avoidance-based motivation. This distinction was important for evaluating whether the training program strengthened positive academic motivation rather than only reducing failure avoidance (Rean, 2004).

A. Zverkov and E. Eidman's "Volitional Self-Regulation Study" questionnaire assessed general volitional regulation and perseverance. The instrument was used because these qualities correspond to the motivational-volitional component of CA and are significant for students' ability to sustain independent learning activity (Zverkov & Eidman, n.d.).

To evaluate the procedural-operational component, the study focused on students' reflection abilities and learning potential:

A. Karpov's "Reflection Diagnosis" questionnaire assessed the development of reflective abilities, including the student's capacity to analyze actions, learning difficulties, and results. This tool was aligned with the procedural-operational component because reflection supports self-monitoring and correction in learning (Karpov, 2003).

P. I. Tretyakov's modified "Assessment of Learning Potential" method was applied to evaluate students' ability to master new educational material and transfer learning strategies to new tasks. The modified version was used as a pedagogical diagnostic tool appropriate for university learning contexts (Tretyakov & Sennovsky, 1997).

Statistical Analysis:

- Results were statistically analyzed using Pearson's χ^2 test and Microsoft Excel for data processing.

- All instruments were administered to CG and EG students under comparable conditions before and after the formative stage. The scores were interpreted according to the published methodological descriptions of each instrument, and the same diagnostic criteria were applied to both groups to support comparability.

RESULTS

The results of our study (see Table 1) indicate that the teaching methods and tools used in the training program for activating students' cognitive activity (CA) had predominantly positive effects, both on individual components of CA and on its overall development.

Table 1.

Dynamics of changes in the development indicators of CA components in CG and EG during the semester (% , maximum level)

CA Component of a student	CG (61)			EG (66)			χ^2
	Start of Exp.	End of Exp.	Change	Start of Exp.	End of Exp.	Change	
Motivational-volitional							
1. Place of cognitive motive in the motivation system (V. Gerbachevsky's method)	11.3	16.9	+6.6	19.7	61.3	+41.6	54.12
2. Motivation for success and avoidance of failure (A. Rean's questionnaire)	12.7	22.6	+9.9	18.5	58.1	+39.6	17.12
3. Study of volitional self-regulation (A. Zverkov and E. Eidman's method)	21.4	43.3	+21.9	24.6	57.1	+32.5	10.11
Procedural-operational							
1. Reflection diagnosis (A. Karpov's method)	13.8	16.9	+3.1	18.1	37.5	+19.4	7.46
2. Diagnosis of student learning ability (P. Tretvyakov's method)	21.4	25.3	+4.9	26.7	43.7	+17.0	10.53

Note. Prepared by the authors.

The results of the study on the motivational-volitional component show that the role of the cognitive motive within the motivation system of students in the control group (CG) changed slightly over the course of the experiment. By the end of the experiment, the cognitive motive was one of the leading motives for 16.9% of CG students, an increase of 6.6% compared to the beginning. However, a primary motive for CG students throughout the experiment was the competitive motive, indicating that the group did not reach a high level of development and did not form a cohesive collective. Instead, CG students primarily perceived each other as competitors.

In contrast, among students in the experimental group (EG), who underwent the targeted intervention, the cognitive motive initially ranked sixth. Over the course of the experiment, it

showed significant growth, peaking at the end, when it became one of the leading motives in their activities. By the conclusion of the experiment, the cognitive motive held a prominent position in the motivation structure of 61.3% of EG students, an increase of 41.6% compared to the beginning.

Among 58.1% of students in the EG, a motivational orientation toward success was observed, whereas in the CG, only 22.6% of students demonstrated motivation for success.

The results of the study on volitional self-regulation show an increase in the overall indicator of volitional self-regulation in both groups. In the CG, the increase was 21.9%, while in the EG, it was 32.5% compared to the start of the experiment. Students with a high level of self-regulation displayed confidence, realistic perspectives, and the ability to control their actions.

The indicators for the procedural-operational component also showed a trend toward increased levels of reflection. Among EG students, the level of reflection improved during the experimental work, with 37.5% of students ultimately demonstrating a high level of reflection, an increase of 19.4% from the start of the experiment. In contrast, the CG saw an increase of only 3.1%, with 16.9% of CG students achieving a high level of reflection.

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The diagnosis of learning ability in the EG revealed that 43.7% of students reached a high level of learning ability, an increase of 17% compared to the start of the experiment. In the CG, this indicator was only 25.3%, reflecting a change of less than 5%.

Statistical calculations showed that the empirical values of the χ^2 test fall within the significance zone ($p < 0.05$). This leads to the rejection of hypothesis H_0 and acceptance of H_1 for the EG. Thus, the empirical distributions of EG and CG students across the components of cognitive activity differed significantly after the experiment.

DISCUSSION

The experimental results indicate that the training program strengthened both components of CA. The largest gains in the EG concerned the place of cognitive motive in the

motivational system (+41.6%) and motivation for success (+39.6%), which confirms the position of Kameneva and Bondarenko (2018) and Ling et al. (2023) that learning activity depends strongly on students' motives, values, and achievement orientation.

The increase in volitional self-regulation in the EG (+32.5%) also supports the view of Nekrasova and Chikova (2021) and Koverets (2020), who interpret cognitive activity as a unity of intellectual, emotional, and volitional dimensions. In this respect, the findings converge with earlier theoretical claims that CA cannot be reduced to cognitive processes alone.

The growth of reflection (+19.4%) and learning ability (+17.0%) in the EG is consistent with Sitarov and Shinin (2017), who emphasize reflection as a key mechanism of cognitive acts. At the same time, the modest changes in the CG show that ordinary instruction alone is insufficient for stable CA development; targeted psychological and pedagogical support is needed.

These findings clarify the practical role of instructors and group mentors. Their task is not only to transmit content but also to organize learning situations that connect motivation, self-regulation, reflection, and independent work. This supports Danushenkov's (2016) argument that the developmental function of education requires a balance between teacher guidance and student autonomy.

Accordingly, the activation of CA should begin with diagnosis and goal-setting. Instructors should create a positive emotional attitude toward the discipline, formulate clear learning objectives, and use tasks that make the practical value of knowledge visible.

The second stage should focus on exploratory and educational-cognitive activities, including problem-based tasks, self-monitoring, and self-correction. These elements are consistent with research emphasizing independent work as a condition for cognitive engagement.

The third stage should support independent cognitive work and individual creative activity while taking into account students' interests, learning pace, and reflective capacities (Bozhkova et al., 2024).

From a pedagogical perspective, activation of CA is most effective when teaching material combines novelty, practical significance, and opportunities for reflection. This means that instructors should introduce recent facts and applications, connect theoretical content with real professional tasks, and encourage students to explain, compare, and evaluate information.

Problem-based learning is especially relevant because it generates intellectual difficulty, surprise, and a need for deeper inquiry. These features transform cognitive activity from a passive response to instruction into an active search for meaning.

The psychological climate of the academic group is also significant. A supportive and relatively conflict-free environment reduces emotional barriers to learning and helps students participate more actively in collective and individual tasks.

For this reason, mentors and psychologists should be involved when adaptation difficulties, interpersonal conflicts, or low motivation hinder learning. Their participation can support students' socialization and create safer conditions for the development of CA.

The results also show that assessment and self-assessment should be used developmentally rather than only for control. When students evaluate their progress, identify difficulties, and plan improvement, they develop responsibility, accuracy, critical thinking, and readiness for self-directed learning (Katunin, 2023; Novichkov et al., 2022).

Thus, the discussion of the findings demonstrates convergence between the experimental results and the cited literature. The training program was effective because it addressed the same mechanisms identified in previous studies: motivation, volitional regulation, reflection, independent work, and the social-psychological conditions of learning.

In practical terms, universities should integrate such training into first-year adaptation programs and courses that require a high level of independent work. Teachers should combine short diagnostic activities, reflective journals, problem tasks, and feedback sessions to monitor CA development throughout the semester.

Group mentors should pay attention to psychological climate, because interpersonal tension can undermine motivation and reduce students' readiness to engage cognitively. Psychologists can complement this work through preventive and corrective activities aimed at adaptation, self-regulation, and constructive communication.

These recommendations are directly grounded in the empirical findings: the strongest improvements were achieved where the program targeted motivation, volition, reflection, and learning ability simultaneously.

FINAL CONSIDERATIONS

The study showed that a structured training program can effectively activate students' CA when it combines psychological support with pedagogical tasks aimed at motivation,

volitional self-regulation, reflection, and independent learning. Compared with the control group, the experimental group demonstrated stronger growth in cognitive motivation, success orientation, self-regulation, reflection, and learning ability. These results confirm that CA develops most effectively under purposeful psychological and pedagogical conditions rather than through ordinary instruction alone.

The practical implication is that universities should integrate diagnostic, reflective, and problem-based training elements into the educational process, especially in programs that require extensive independent work. Future research should examine the long-term stability of these effects, test the program in different disciplines and institutional contexts, and clarify which training components produce the strongest impact.

REFERENCES

- Abdullayev, I., Akhmetshin, E., Nayanov, E., Otcheskiy, I., & Lyubanenko, A. (2024). Possibilities of using online network communities in the educational process to develop professional skills in students. *Conrado*, 20(98), 395–401.
- Alperovich, V. (2023). Sub'yektivnyy "obraz mira": Sravnitel'nyy analiz kontseptual'nykh modeley [Subjective "world image" at the stage of early adulthood: Comparative analysis of conceptual models]. *Psikhologiya i Psikhotekhnika*, 4, 104–117. <https://doi.org/10.7256/2454-0722.2023.4.68726>
- Altukhova, M. A. (2018). Strukturno-dinamicheskaya model' poznavatel'noy aktivnosti studenta v kontekste formirovaniya informatsionnykh kompetentsiy [Structural-dynamic model of student cognitive activity in the context of forming informational competencies]. *Problemy Sovremennogo Pedagogicheskogo Obrazovaniya*, 60(3), 14–18.
- Aziyev, A., Shalgynbayeva, K., Aitysheva, A., & Alpyssov, A. (2024). Impact of psychological training on the development of professionally important qualities of an educational psychologist. *European Journal of Contemporary Education*, 13(1), 5–13. <https://doi.org/10.13187/ejced.2024.1.5>
- Bobrova, I. A. (2007). Razvitiye poznavatel'noy aktivnosti studentov v sisteme nepreryvnogo professional'nogo obrazovaniya [Development of students' cognitive activity in the system of continuous professional education]. *Nauka. Innovatsii. Tekhnologii*, 51, 19–23.
- Bolgar, N. N., & Solovyov, T. V. (2019). Poznavatel'naya aktivnost' studentov v sisteme spo kak pokazatel' kachestva [Cognitive activity of students in the SPO system as an indicator of quality]. *Problemy Sovremennogo Pedagogicheskogo Obrazovaniya*, 63(2), 69–72.
- Bozhkova, G., Ganova, T., Saltykova, G., Khakimov, N., & Stepanova, D. (2024). Using smartphones to enhance creative cognitive engagement in student learning: A case study. *Interacción y Perspectiva*, 15(1), 75–86. <https://doi.org/10.5281/zenodo.14031077>
- Buzdalova, N. V. (2016). Triyedinaya sistema zadaniy kak sredstvo organizatsii poznavatel'noy deyatel'nosti uchashchikhsya [A triune system of tasks as a means of organizing students' cognitive activity]. *Scientific-Methodical Electronic Journal "Concept"*, 11, 1571–1575.
- Danushenkov, V. S. (2016). *Tselostnyy podkhod k formirovaniyu poznavatel'noy aktivnosti v obuchenii* [A holistic approach to forming cognitive activity in learning]. Raduga.
- Fedorovich, N. Y. (2010). Poznavatel'naya aktivnost' lichnosti studenta kak pedagogicheskiy fenomen [The cognitive activity of a student's personality as a pedagogical phenomenon]. *Herald of Polotsk State University. Series: Pedagogical Sciences*, 11, 61–66.

- Fialko, A. I. (2015). Modelirovaniye pedagogicheskogo soprovozhdeniya aktivizatsii poznavatel'noy deyatelnosti obuchayushchikhsya [Modeling pedagogical support for activating students' cognitive activity]. *Nepreryvnoye Obrazovaniye*, 11(1), 16–20.
- Gabidullina, F., Nikiforova, N., Afanasyeva, I., & Zharov, A. (2023). Improvement of the learning process: The experience of introducing a cumulative system in assessing student learning success in distance learning. *European Journal of Contemporary Education*, 12(4), 1223–1230. <https://doi.org/10.13187/ejced.2023.4.1223>
- Gribova, E. P. (2020). Fenomen poznavatel'noy aktivnosti v aspekte filosofskikh i psikhologo-pedagogicheskikh issledovaniy [The phenomenon of cognitive activity in the aspect of philosophical and psychological-pedagogical research]. *World of Science. Pedagogy and Psychology*, 8(4), Article 31PDMN420.
- Kameneva, G. A., & Bondarenko, T. A. (2018). Pedagogicheskiye usloviya aktivizatsii uchebno-poznavatel'noy deyatelnosti studentov v sovremennykh usloviyakh informatizatsii obrazovaniya [Educational factors in enhancing students' learning and cognitive activities within the framework of educational informatization]. *Novosibirsk State Pedagogical University Bulletin*, 8(4), 172–186. <https://doi.org/10.15293/2226-3365.1804.11>
- Karpov, A. V. (2003). Refleksivnost' kak psikhicheskoye svoystvo i metodika yeye diagnostiki [Reflexivity as a psychological trait and methods for its diagnosis]. *Psikhologicheskii Zhurnal*, 5, 45–57.
- Katunin, A. V. (2023). Osobennosti primeneniya navykov kriticheskogo myshleniya v protivodeystvii manipulyatsiyam v sovremennoy kommunikatsii [Features of the use of critical thinking skills in countering manipulation in modern communication]. *Filosofskaya Mysl'*, 12, 70–82. <https://doi.org/10.25136/2409-8728.2023.12.39541>
- Kiselitsa, E., Liman, I., Shilova, N., Vilkov, I., & Danilova, E. (2024). Use of distance technologies in developing the STEM trajectory of training. *Conrado*, 20(97), 472–480.
- Koverets, E. S. (2020). Professional'no-poznavatel'naya aktivnost' u studentov pedagogicheskikh i nepedagogicheskikh spetsial'nostey [Professional-cognitive activity of the students of pedagogical and non-pedagogical specialties]. *Scientific Works of the Republican Institute of Higher Education*, 20(3), 128–136.
- Kryucheva, Y., & Tolstoukhova, I. (2023). Modern ways of learning as a means of enhancing the cognitive activity of students. *Nuances*, 34, e023006. <https://doi.org/10.32930/nuances.v34i00.9963>
- Lagunova, M. V., & Yurchenko, T. V. (2011). *Upravleniye poznavatel'noy deyatelnosti'yu studentov v informatsionno-obrazovatel'noy srede vuza [Management of students' cognitive activity in the information-educational environment of a university]*. NNGASU.
- Ling, P., Isaeva, N., Bolzan, N., Kolganov, S., Chirich, I., & Zhabchik, S. (2023). Student motivation in humanities: Its impact on academic performance and professional development. *Interacción y Perspectiva*, 14(1), 230–243. <https://doi.org/10.5281/zenodo.10456690>

- Maksimov, R. S., & Klykov, A. D. (2016). Ispol'zovaniye interaktivnykh form obucheniya dlya aktivizatsii poznavatel'nogo protsessa u studentov prikladnogo bakalavriata [Using interactive forms of teaching to stimulate cognitive process among students – applied bachelors]. *Al'manakh Sovremennoy Nauki i Obrazovaniya*, 108(6), 32–35.
- Nekrasova, I. I., & Chikova, O. A. (2021). Poznavatel'naya aktivnost' studentov: Soderzhaniye i metody izmereniya [Cognitive activity of students: Content and measurement methods]. *Bulletin of Altai State Pedagogical University*, 48(3), 63–68. <https://doi.org/10.37386/2413-4481-2021-3-63-68>
- Nikolaev, A. N. (2015). Poznavatel'naya aktivnost' studentov pedagogicheskikh vuzov i yeye psikhologicheskiye faktory [The cognitive activity of pedagogical university students and its psychological factors]. *Bulletin of Pskov State University. Series: Psychological and Pedagogical Sciences*, 1, 166–172.
- Novichkov, V. B., Ilyichyova, I. V., & Potapov, D. A. (2022). Printsipy konstruirovaniya soderzhaniya obshchego srednego obrazovaniya [Principles of constructing the content of general secondary education]. *Anthropological Didactics and Upbringing*, 5(4), 10–26.
- Proskuryakova, E. A. (2019). Razvitiye poznavatel'noy aktivnosti studentov v protsesse prepodavaniya kursa obshchey fiziki [Development of cognitive activity of students in teaching general physics course]. *Mir Nauki, Kultury, Obrazovaniya*, 3(76), 59–61.
- Raigorodsky, D. Y. (2011). *Prakticheskaya psikhodiagnostika: Metodiki i testy* [Practical psychodiagnostics: Methods and tests]. Bahrah-M.
- Rean, A. A. (2004). *Psikhologiya lichnosti: Sotsializatsiya, povedeniye, obshcheniye* [Personality psychology: Socialization, behavior, communication]. Prime-EVROZNAK.
- Reutova, V. V. (2020). Aktivizatsiya poznavatel'noy deyatel'nosti studentov posredstvom ispol'zovaniya interaktivnykh metodov obucheniya [Activation of the cognitive activity of students through the use of interactive teaching methods]. *World of Science. Pedagogy and Psychology*, 8(2), Article 11PDMN220.
- Shichkin, I., Sizova, Y., Kolganov, S., & Panova, E. (2024). Perception of the flipped classroom model by students in the process of studying humanities disciplines. *European Journal of Contemporary Education*, 13(2), 423–433. <https://doi.org/10.13187/ejced.2024.2.423>
- Sitarov, V. A., & Shinin, M. Y. (2017). Logika razvitiya poznavatel'noy aktivnosti [The logic of cognitive activity development]. *Problemy Sovremennogo Pedagogicheskogo Obrazovaniya*, 55(7), 77–87.
- Togaibayeva, A., Ramazanova, D., Kartbayeva, Z., & Kereyeva, R. (2023). Effect of the development of didactic and practical skills in future special education teachers on their professional readiness for work in an inclusive educational environment. *European Journal of Contemporary Education*, 12(4), 1447–1462. <https://doi.org/10.13187/ejced.2023.4.1447>

- Tretyakov, P. I., & Sennovsky, I. B. (1997). *Tekhnologiya modul'nogo obucheniya v shkole: Praktiko-oriyentirovannaya monografiya [Technology of modular learning in schools: A practice-oriented monograph]*. Novaya shkola.
- Zverkov, A. V., & Eidman, E. V. (n.d.). *Volitional self-regulation study questionnaire*.
<https://psylist.net/praktikum/00417-htm>

CRediT Author Statement

- ☐ **Acknowledgments:** We would like to acknowledge editors and reviewers' help.
 - ☐ **Funding:** Not applicable.
 - ☐ **Conflicts of interest:** Authors declare no conflict of interest.
 - ☐ **Ethical approval:** Not applicable.
 - ☐ **Data and materials availability:** Available upon request from the authors.
 - ☐ **Author contributions:** All authors have contributed equally.
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Processing and editing: Editora Ibero-Americana de Educação
Review, formatting, standardization, and translation

