

DEVELOPING FUTURE EDUCATORS' SCIENTIFIC COMMUNICATION SKILLS THROUGH COGNITIVE METHODS

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Abstract. This article addresses the issue of developing scientific communication skills in future preschool educators through cognitive methods. In today's educational system, the professional competence of a future educator is not limited to theoretical knowledge but is closely connected with the ability to think scientifically, systematically analyze information, and express well-reasoned opinions. In this context, the use of cognitive methods proves to be an effective approach to enhancing students' cognitive activity and forming their scientific-communication competence.

The article examines the effectiveness of a modular teaching structure aimed at developing future educators' scientific communication and cognitive skills. During the research, instructional content based on the cognitive educational technology proposed by E.A. Bershanskaya was developed. The initial and final results of the students were comparatively analyzed. The diagnostic stage revealed that students lacked proficiency in scientific terminology, text analysis, and expressing opinions in academic language. The control tasks and reflection results at the end of the module demonstrated that cognitive methods stimulate cognitive processes and contribute to the development of logical thinking and scientific writing skills.

Data obtained based on evaluation criteria confirmed the importance of assignments such as concept maps, essays, and reflections in improving students' professional competencies. The research results indicate that a modular teaching approach based on cognitive methods can serve as an effective pedagogical model in the preparation of future educators. This approach fosters learners' metacognitive skills and supports their adaptation to professional activities. The findings of the article are significant in terms of providing methodological recommendations for improving the content of pedagogical education.

Keywords: cognitive methods, scientific communication skills, future educator, preschool education, cognitive competence, professional training, cognitive technology

Introduction

In the Concept for the Development of Higher Education and Science in the Republic of Kazakhstan for 2023-2029, modernizing research activities stands as a primary objective. The document emphasizes the need to transform the research focus of higher and postgraduate educational institutions into a core center for shaping and advancing a new generation of talented educators. Such a shift highlights the critical importance of professionally preparing graduates from pedagogical universities (Government of the Republic of Kazakhstan, 2023).

The State Compulsory Educational Standard defines specific requirements for knowledge, skills, and qualification levels. The standard outlines students' capacity to solve problems within the realm of research activities (Ministry of Science and Higher Education of the Republic of Kazakhstan, 2022). It specifies a bachelor's ability to gather, analyze, systematize, and utilize information regarding current scientific and educational issues. Graduates must be able to develop modern technologies, conduct experimental work, and critically evaluate the effectiveness of the educational process. The mentioned factors of educational system changes indicate that altering the functions of a future teacher currently correlates directly with research activity in both pedagogical theory and practice.

Various instructional methods aimed at implementing active learning are widely proposed within the educational sphere. We identify the cognitive teaching approach as one of the most effective among them. Modern intelligence research increasingly favors the term "cognitive" over traditional concepts like "attention", "memory", and "thinking" to describe human mental activity. The cognitive teaching method relies on the principles of cognitive psychology, which investigates the human mind, thought processes, and related mental states and operations.

Applying cognitive methods serves as an effective strategy for increasing students' intellectual engagement and building their scientific and communicative competence. Given the relevance of the issue, the aim of the study is to develop the content of a modular structure focused on cultivating the scientific and communicative skills of future preschool teachers based on cognitive teaching methods, and to empirically determine its effectiveness.

Cognitive methods are instructional strategies directed at developing a learner's mental abilities. They activate psychological processes like memory, attention, thinking, comprehension, reasoning, and problem-solving.

Cognitive teaching methods increase learners' intellectual activity and foster their capacity to process, analyze, and synthesize information. Integrating these approaches into professional training shapes future educators' scientific thinking and their ability to articulate thoughts coherently using scientific evidence.

In recent years, pedagogical science has frequently examined concepts of metacognition, critical thinking, and intellectual activity. All the aforementioned elements closely connect with cognitive teaching methods and emerge as the main mechanism for enhancing the scientific and communicative potential of a future educator. The article explores ways to develop the scientific and communicative skills of future preschool teachers through cognitive methods.

Literature Review

Cognitive learning theory serves as one of the essential methodological foundations aimed at activating cognitive processes in the modern educational system. The scientific principles of the theory are comprehensively examined in the works of prominent scholars like J. Piaget, J. Bruner, R. Gagné and B. Bloom. Specifically, by describing the stages of cognitive development, J. Piaget indicated that educational content and methods must align with a child's age characteristics. According to him, developing intellectual engagement should rely on independent exploration, structuring, and application of knowledge rather than mere assimilation (Piaget, 2022).

J. Bruner argued for organizing the teaching process based on the learner's cognitive structure. He proposed a "spiral curriculum", concluding that educational content should deepen progressively in accordance with the student's level of intellectual development (Bruner, 2006). R. Gagné categorized the learning process into cognitive levels, specifying the unique objectives and techniques for each stage (Gagné, 1987).

Foreign research also extensively investigates the connection between cognitive methods and communicative skills. By analyzing educational materials designed to effectively teach scientific communication fundamentals to undergraduate students, Mercer-Mapstone and Kuchel (2015) clarify that developing these skills directly impacts the scientific literacy and professional self-realization of a future specialist (Mercer-Mapstone & Kuchel, 2015).

In the article, the authors do not limit scientific communication merely to written or oral presentation skills; instead, they closely associate it with a student's understanding of the audience, ability to purposefully structure information, and capacity to deliver science to the public accessibly. These skills are particularly crucial for future educators, as they must be able to convey scientific information in simple, understandable language.

To develop scientific-communicative abilities during the educational process, the systematic application of metacognitive strategies, practice-oriented tasks, and feedback is recommended. The approaches contribute to building the confidence and professional language culture of future specialists.

In their research, Moemeke highlights that comprehensively developing scientific literacy and communication enhances future teachers' ability to deliver science to the public clearly and confidently (Moemeke, 2023). By justifying the social significance of integrating scientific communication elements into the content of science education, the author argues for the necessity of increasing learners' cognitive engagement, strengthening their societal role, and fostering a confident attitude toward science. The method significantly affects the formation of scientific-communicative skills within the professional training framework of future educators. The idea aligns with refining thinking and explanatory skills through cognitive methods because scientific literacy involves not only mastering content but also the ability to adapt and deliver it to an audience.

Cognitive methods are recognized as a powerful tool for investigating and developing interpersonal and internal cognitive processes. Aschwanden, Allemand, and Hill note that cognitive methods allow for uncovering the interrelationship between personality traits and cognitive processes (Aschwanden, Allemand & Hill, 2020). Through the approaches, one can systematically analyze a person's thinking, memory, attention, and decision-making abilities. The mechanisms can play an important role in evaluating the professional development and communicative potential of future educators. Furthermore, metaphorical-cognitive models are being studied as one of the effective methods for developing linguistic and communicative abilities. As research conducted with English language learners has shown, cognitive methods based on metaphors yield positive results in understanding and applying polysemous phrasal verbs (Lee & Zhai, 2024). The approach can be adapted for future educators and assist them in mastering scientific terminology and concepts.

Russian scholar E.A. Bershadskaya has authored several important works in the field of cognitive pedagogy and cognitive technologies in education. She designed a concept of cognitive educational technology aimed at cultivating learners' cognitive and metacognitive skills. In the educational process, the learner is viewed not merely as a recipient, but as an active individual responsible for their own cognitive development. They consciously construct their learning trajectory and acquire knowledge independently. The learner's capacity to analyze, evaluate, and synthesize information is established as a developmental objective during the study. The approach directly affects their scientific and communicative skills (Bershadskaya & Bershadsky, 2016).

Applying cognitive schemas, along with the frequent use of cognitive diagrams, mind maps, modular technology, and knowledge structuring methods, shapes the future educator's capacity for self-education. The practice enables them to process information effectively, speak logically with supporting evidence, and systematize scientific thought.

The professional identity of a future preschool teacher is inextricably linked to the formation of their scientific communication skills. During their development as professionals, specific scientific abilities hold immense value alongside critical thinking, self-regulation, decision-making, creativity, and responsibility. The essential abilities encompass accurately conveying scientific thought, engaging in professional discourse, analyzing industry publications, and handling scientific data (Ivanova, 2019). The specified skills must be purposefully cultivated within pedagogical education programs.

Scientific communication paves the way for a future educator's readiness to make scientifically grounded decisions, engage in professional dialogue, and pursue continuous learning in their career. The scientific communication culture of an educator transforms into a vital indicator of their professional integrity and educational quality.

Forming a professional identity links directly with core skills like willpower, responsibility, foresight, self-regulation, decision-making, creativity, and the drive for success (Nagornova, Nagornov & Kiryukhina, 2012). The qualities ensure a future educator's readiness for professional activities. The process of shaping a professional identity intertwines closely with teaching uniqueness, which develops through cognitive, social, and professional elements. The theoretical findings prove the significance of the cognitive teaching method in developing the professional competence of a future pedagogical specialist (Kopeyev et al., 2024). A pedagogue must be a specialist

who organizes the learner’s cognition and stimulates active thinking, rather than merely acting as an information provider (Erdembekova, Bulshekbayeva & Ural, 2025).

Structurally, the cognitive teaching method consists of several interconnected stages. They include goal setting and comprehension, active information processing (comparing, analyzing, generalizing), drawing conclusions and synthesizing, reflection (analyzing one’s own actions and thought processes), feedback, and correction. The structure enables the learner to master knowledge systematically while developing their logical and analytical thinking skills.



Figure 1. Core principles of the cognitive teaching method

Figure 1 presents the core principles of the cognitive teaching method in a step-by-step manner. The principles encompass the structural logic of instruction, covering all processes from goal setting to reflection and correction. The systematic approach ensures the holistic development of learners’ cognitive engagement and thinking abilities.

Overall, cognitive methods function as an effective tool in forming the scientific and communicative skills of future educators. The techniques enhance the learner’s independent thinking capacity and develop the skills of articulating scientifically grounded opinions and speaking with evidence. As the analysis demonstrates, the research topic represents one of the pressing issues in pedagogical science, requiring further in-depth theoretical and practical investigation.

Materials and Methods

In the modern educational process, cognitive educational technologies occupy a vital position in forming the professional competence of a future preschool teacher. Among the approaches, the modular teaching structure is recognized as an effective instrument aimed at elevating learners’ cognitive engagement and advancing their scientific and communicative abilities.

Currently, shaping students’ thinking capacity, alongside their information structuring and analytical skills, through the successful application of cognitive methods in training pedagogical specialists has emerged as a highly relevant issue. In the specific area, the cognitive educational technology proposed by E.A.Bershadskeya can act as a foundation for securing learners’ scientific speech culture, argumentative reasoning ability, and mastery of terminological information.

The modular instruction framework targets the step-by-step development of learners' scientific-communicative and cognitive skills. During the initial stage of the module, the level of learners' scientific, linguistic and cognitive proficiency is assessed. Favorable conditions are subsequently established to help them understand concepts and definitions within a logical system by working with a cognitive map. The assignments enable the evaluation of a student's capacity to handle conceptual data and their scientific information processing skills.

In the final stage of the module, learners are required to create a mind map, write a scientific essay, and conduct a reflective analysis. At the specified phase, the evaluation focuses on the student's ability to synthesize thoughts freely in academic language, express reasoned opinions while maintaining logical connections, and apply scientific terminology correctly. Furthermore, a reflection sheet facilitates the analysis of concepts mastered and skills developed during the module, clarifying their potential applications in future professional practice.

The quality of scientific writing, the degree of information structuring, logical coherence, and the practical skill of using cognitive methods serve as the assessment criteria. The metrics allow for a systematic evaluation of a student's scientific and communicative competence and target the enhancement of a future educator's professional training quality.

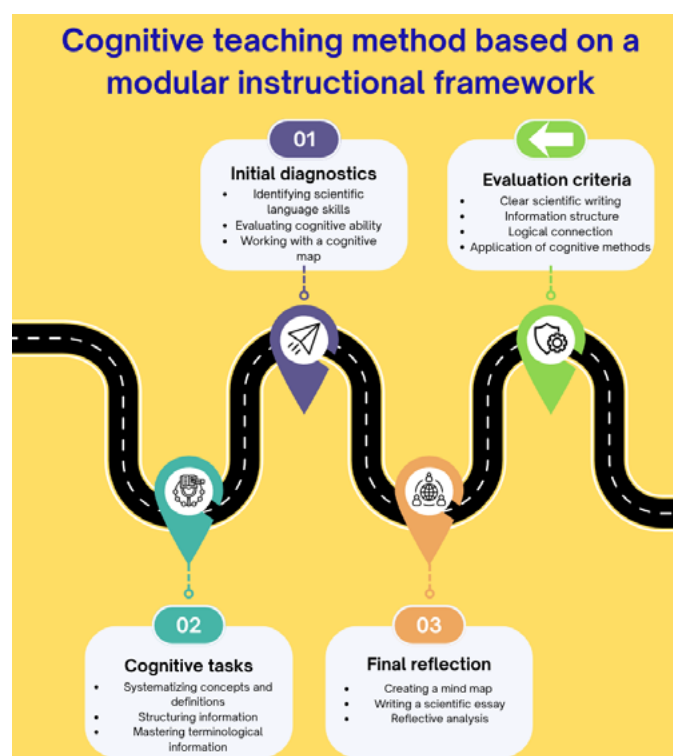


Figure 2. The cognitive teaching method based on a modular instructional framework

Figure 2 illustrates the logical connection of cognitive methods integrated into the modular instructional framework. Each block complements the others, aiming at the systematic development of a student's scientific and communicative skills. The structure guarantees a continuous learning process, ranging from the identification of a student's initial baseline to their professional advancement through reflection.

Therefore, the modular instructional structure, designed by merging cognitive methods with scientific and communicative skills, makes a substantial contribution to the professional development of a future preschool teacher. The approach does more than merely introduce innovative content into pedagogical education; it actively fosters a student's personal and professional growth.

Results and Discussion

During the research, qualitative and quantitative analysis methods were applied to develop the scientific-communicative and cognitive skills of future preschool teachers. The experimental work was conducted during the

2024-2025 academic year with third-year students majoring in 6B01201 - "Preschool education and upbringing" at Abai Kazakh National Pedagogical University. The total sample consisted of 51 students. Purposive sampling was utilized, including learners who voluntarily agreed to participate in the study.

The research involved three distinct phases: diagnostic, educational-practical, and final. During the diagnostic stage, we determined the learners' baseline scientific-communicative and cognitive abilities. To achieve the objective, author-developed control tasks, questionnaires, essays, mind maps, and reflection sheets were applied. The evaluation criteria relied on the following metrics:

1. quality of scientific writing;
2. degree of information structuring;
3. capacity to build logical connections;
4. practical skill in effectively applying cognitive methods.

Throughout the study, integrating the modular instructional framework with E.A. Bershadskaya's cognitive methods proved highly effective in fostering the scientific-communicative and cognitive proficiencies of future pre-school teachers. Information gathered at the diagnostic stage exposed notable gaps in the learners' initial readiness: 62% found it difficult to utilize scientific terminology, 55% struggled to identify logical textual structures, and 48% faced challenges adhering to standard scientific writing norms. The figures highlight a lack of adequate scientific literacy and cognitive engagement among the students.

Subsequent control tasks carried out during the final stage of the module revealed positive momentum regarding the students' scientific and cognitive competencies. Notably, 73% of the learners managed to accurately depict logical links between concepts during the mind map assignment; when drafting essays, 68% maintained a proper academic tone, showcasing terminological precision and the capacity to formulate evidence-based arguments. Additionally, 85% of the participants grasped the core principles of cognitive methods, clearly recognizing how they might apply them in their prospective careers. Data compiled according to the evaluation criteria presented the results below:

Table 1. Data compiled according to the evaluation criteria

Skill type	High level (%)	Medium level (%)	Low level (%)
Scientific writing	68	25	7
Information structuring	73	22	5
Logical connection	70	24	6
Application of cognitive methods	76	18	6

Overall, the systematic content of the modular instructional framework and its foundation in cognitive methods enabled the achievement of high results in enhancing students' scientific-communicative competence. Additionally, the end-of-module assignments strengthened the professional and cognitive engagement of the learners, contributing to the development of their reflective and analytical thinking abilities.

As Table 1 illustrates, students' skills in scientific writing (68%) and information structuring (73%) developed to a high degree. The outcome demonstrates the direct result of the systematic application of cognitive methods. Furthermore, high indicators are also evident regarding the capacity to establish logical connections and utilize cognitive methods (70% and 76%). The data proves the effectiveness of the modular instructional structure in cultivating students' scientific-communicative competence.

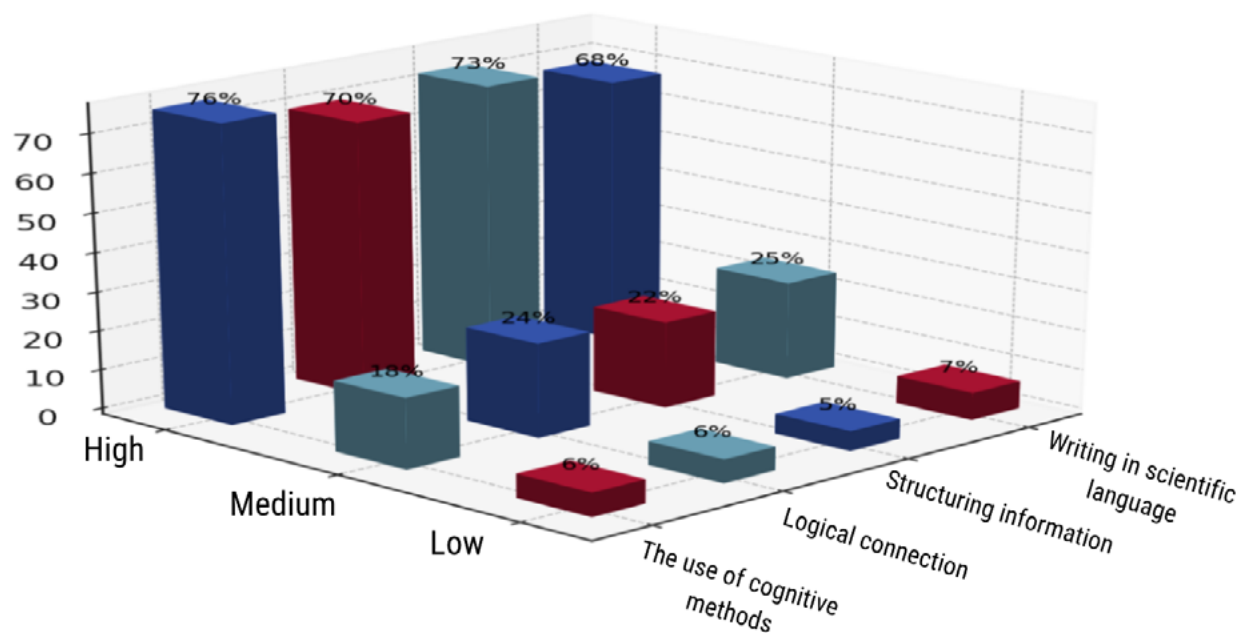


Figure 3. The level of scientific and cognitive skills of future preschool teachers

Figure 3 explicitly shows the qualitative changes in students' scientific and cognitive skills after applying cognitive methods. The proportion of students who reached a high level across all indicators increased significantly. The results confirm the possibility of purposefully developing professional competence through cognitive approaches.

To ensure the validity and reliability of the research data, experts in the field of pedagogy and psychology preliminarily reviewed the content of the methodological tools, followed by pilot testing. To evaluate the statistical significance of the obtained results, Fisher's φ -empirical criterion was applied. According to the criterion, the statistical reliability of the difference between the results at the diagnostic and final stages was determined ($\varphi_{emp} > \varphi_{cr}$, $\varphi_{cr} = 1.64$, $\alpha = 0.05$).

During the educational-practical stage, a modular program based on E.A.Bershanskaya's cognitive technology was implemented. The module consisted of three blocks:

- mastering cognitive concepts
- developing argumentation skills in scientific language
- forming personal reflection and independent conclusions.

Within the modular framework, students completed assignments like creating cognitive maps, writing thematic scientific essays, conducting metacognitive analysis, and designing mind maps. Scaled evaluation criteria were prepared in advance for each task (4 levels: high - 3 points, medium - 2 points, low - 1 point, unformed - 0 points).

Data obtained at the final stage demonstrated a qualitative increase in students' scientific-communicative competencies and cognitive skills. For instance, 68% of students showed a high level in essay assignments written in academic language with a logical structure, while 73% correctly indicated the connections between concepts in the mind map task. In the reflection sheets, 85% of the learners clearly specified the possibility of applying cognitive methods in their prospective professional activities.

As a result of the comparative analysis conducted using Fisher's φ -criterion, statistically reliable progress was recorded across all dimensions. The research findings proved that modular instruction based on cognitive methods can serve as an effective tool in systematically developing the scientific-communicative and cognitive skills of future preschool teachers.

In the field of cognitive science, the works of K. Stenning and M. Lambalgen view human logical reasoning not as an innate automatism, but rather as a complex process formed and developed through cognitive context (Stenning & van Lambalgen, 2008). By illustrating the difference between formal logic and natural thinking processes, the authors justify the necessity of purposefully applying formalized cognitive approaches to construct scientific evidence and form discursive actions. The approaches can act as an effective instrument in developing the scien-

tific-communicative skills of future educators, because they adapt them to a culture of evidence-based thinking, logical structuring, and argumentation.

L.V.Akhmetova approaches cognitive teaching from a psychological and didactic perspective, proposing specific methodologies to activate learners' thinking activities and develop their ability to express reasoned opinions in academic language (Akhmetova, 2009). Specifically, cognitive training facilitates the formation of logical thinking, cognitive reflection, and professional speech culture among future educators. Through the techniques, students learn to substantiate their viewpoints on a scientific basis, perceive educational material structurally, and participate freely in professional discourse. The studies by A.A. Yuroshkevich and A.V. Yuroshkevich deserve special attention in revealing the role and significance of cognitive methods in the educational process. According to the scientists, in the modern educational system, developing students' cognitive functions and soft skills is becoming a pressing task, rather than being limited solely to academic knowledge. Among them, teamwork, thinking, attention, and memory directly affect professional adaptation and personal development (Yuroshkevich & Yuroshkevich, 2025).

As researchers note, in the context of globalization and digitalization, teamwork and cognitive abilities are recognized as some of the decisive factors impacting learners' success.

The conclusion applies equally to the professional training of future preschool teachers, because the effective formation of scientific communication skills is impossible without cognitive foundations. Namely, systematizing scientific thought, retaining information, expressing reasoned opinions, and thinking critically serve as the core of scientific communication.

The research results confirm the effectiveness of modular instruction based on applying cognitive educational technologies in developing the scientific-communicative and cognitive skills of future preschool teachers. Weaknesses identified during the initial diagnostics - understanding scientific terminology, applying argumentation, and logically structuring information - improved significantly in the end-of-module results. Assignments like mind mapping and essay writing held exceptional importance in shaping learners' analytical thinking, their ability to establish logical connections, and their skill in writing proficiently in academic language. The findings indicate that cognitive methods facilitate the achievement of professional competence in future specialist training by activating cognitive processes.

Additionally, the reflection sheet allowed students to consciously evaluate their own cognitive and professional achievements and to self-monitor the learning process. The component served to develop learners' metacognitive skills, strengthening their readiness for future professional activities. The recording of comparatively high percentage indicators (70% and above) proves that the research content was structured according to the actual needs of the learners, utilizing effective methodological approaches. However, the persistence of medium- and low-level indicators warns that some learners still require additional support and personalized learning trajectories.

Conclusion

The research results clearly demonstrated that the modular instructional framework based on cognitive methods possesses high effectiveness in developing the scientific-communicative and cognitive skills of future preschool teachers. Qualitative and quantitative data obtained during the experimental work proved that cognitive approaches significantly affect the formation of students' skills in thinking in academic language, structuring information, argumentative writing, and metacognitive reflection.

Cognitive educational technologies not only increase students' cognitive engagement but also elevate their level of adaptation to professional activity. Specifically, tasks like creating mind maps, writing scientific essays, logically systematizing concepts, and conducting reflective analysis refined the research thinking capacity of future educators and developed their skills in scientifically analyzing, proving, and presenting information.

The modular structure encompassed all stages, from diagnosing the learners' baseline level to consolidating the skill. The structured nature created conditions for students to manage their cognitive processes, self-regulate, and achieve professional maturity. Moreover, the evaluation criteria applied during instruction allowed for the qualitative measurement of students' actual achievements and proved the effectiveness of the pedagogical intervention.

The statistical reliability of the results obtained through Fisher's φ -empirical criterion was confirmed. The confirmation ensures the validity and reliability of the research methodology. The cognitive approaches and

pedagogical tools utilized during the study fully comply with the scientific-theoretical and practical requirements of the modern educational system.

The modular instructional model based on cognitive methods is recognized as a new scientific-methodological approach in training future preschool teachers, allowing for the comprehensive development of learners' professional competence. The model holds strategic importance in preparing competitive, scientifically literate, and professionally responsible specialists for the preschool education system. The research results can serve as a methodological base of immense practical significance in revising the content of pedagogical educational programs and elevating teaching quality through the integration of cognitive technologies.

The research findings indicate the necessity of purposefully introducing cognitive technologies into pedagogical educational programs. The modular structure can be applied as a scientific-methodological foundation in training pedagogical personnel. In the future, the model can be adapted to various educational levels and directions, finding broad application in shaping the research competence of an educator.

Contribution of the authors:

Temirkhanova K.Sh. Contributed significantly to the concept and design of the work, analyzed, synthesized, and critically reviewed the text content.

Bulshekbayeva A.I. Summarized the final results of the experiment.

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Развитие научно-коммуникативных навыков будущих воспитателей с использованием когнитивных методов

Аннотация. В статье рассматривается проблема развития научно-коммуникативных навыков будущих педагогов дошкольных учреждений посредством когнитивных методов. В современной системе образования профессиональная компетентность будущего воспитателя не ограничивается только теоретическими знаниями, она напрямую связана со способностью мыслить научно, системно анализировать информацию и высказывать обоснованные суждения. В этом контексте использование когнитивных методов становится эффективным способом повышения познавательной активности студентов и формирования их научно-коммуникативной компетентности. А также рассматривается эффективность модульной структуры обучения, направленной на формирование научно-коммуникативных и когнитивных навыков будущих воспитателей.

В ходе исследования было разработано учебное содержание, основанное на когнитивной образовательной технологии, предложенной Е.А.Бершадской. Проведен сравнительный анализ начальных и итоговых результатов обучающихся. На диагностическом этапе выявлены недостатки у студентов в освоении научной терминологии, работе с текстами и выражении мнений в научном стиле. Контрольные задания и результаты рефлексии в конце модуля показали, что когнитивные методы активизируют познавательные процессы и способствуют развитию логического мышления и навыков научного письма. Полученные на основе критериев оценки данные подтвердили значимость заданий, таких как концепт-карты, эссе и рефлексии, для повышения профессиональной компетентности студентов. Результаты исследования показывают, что модульное обучение, основанное на когнитивных методах, может быть эффективной педагогической моделью подготовки будущих педагогов. Такой подход способствует развитию метакогнитивных навыков учащихся и их адаптации к профессиональной деятельности.

Ключевые слова: когнитивные методы, научно-коммуникативные навыки, будущий воспитатель, дошкольное образование, когнитивная компетентность, профессиональная подготовка, когнитивные технологии

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Болашақ тәрбиешілердің ғылыми-коммуникациялық дағдыларын когнитивтік әдістер арқылы дамыту

Аңдатпа. Мақалада болашақ мектепке дейінгі ұйым педагогтерінің ғылыми-коммуникациялық дағдыларын когнитивтік әдістер арқылы дамыту мәселесі қарастырылады. Қазіргі білім беру жүйесінде болашақ тәрбиешінің кәсіби құзыреттілігі тек теориялық біліммен шектелмей, ғылыми тілде ойлай алу, ақпаратты жүйелі түрде талдау және дәлелді пікір білдіру қабілетімен тікелей байланысты. Осы тұрғыда когнитивтік әдістерді қолдану - студенттердің танымдық белсенділігін арттырып, олардың ғылыми-коммуникациялық құзыреттілігін қалыптастыруда тиімді тәсіл болып отыр. Мақалада болашақ тәрбиешілердің ғылыми-коммуникациялық және когнитивтік дағдыларын қалыптастыруға бағытталған модульдік оқыту құрылымының тиімділігі қарастырылады.

Зерттеу барысында Е.А.Бершадская ұсынған когнитивтік білім беру технологиясына негізделген оқыту мазмұны әзірленіп, білім алушылардың бастапқы және қорытынды нәтижелері салыстырмалы талданды. Диагностикалық кезеңде студенттердің ғылыми терминдерді меңгеруі, мәтінмен жұмыс жасау және ғылыми стильде пікір білдіру дағдыларының жеткіліксіздігі анықталды. Модуль соңындағы бақылау тапсырмалары мен рефлексия нәтижелері когнитивтік әдістердің танымдық процестерді белсендіруге, логикалық ойлау мен ғылыми тілде жазу дағдыларын дамытуға ықпал ететінін көрсетті. Бағалау критерийлері негізінде алынған мәліметтер интеллект-карта, эссе, рефлексия сияқты тапсырмалардың студенттердің кәсіби құзыреттілігін арттыруда маңыздылығын дәлелдеді. Зерттеу нәтижелері когнитивтік әдістерге негізделген модульдік оқытудың болашақ педагогтерді даярлауда тиімді педагогикалық модель бола алатынын көрсетеді. Бұл тәсіл білім алушылардың метатанымдық дағдыларын дамытып, кәсіби қызметке бейімделуіне мүмкіндік береді.

Түйін сөздер: когнитивтік әдістер, ғылыми-коммуникациялық дағдылар, болашақ тәрбиеші, мектепке дейінгі білім беру, танымдық құзыреттілік, кәсіби даярлық, когнитивтік технология.

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