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CONCEPTUAL FOUNDATIONS FOR DEVELOPING FUTURE PEDAGOGUE-PSYCHOLOGISTS' READINESS TO SUPPORT STUDENTS' COGNITIVE ENGAGEMENT

Abstract

The article examines the conceptual foundations of preparing future pedagogue-psychologists to support students' cognitive engagement. The study analyzes key theoretical approaches, including cultural-historical theory, motivational frameworks, constructivist views of learning, and models describing cognitive activity, which together provide a basis for identifying factors that influence students' engagement with academic tasks. Six core factors-cognitive strategy knowledge, metacognitive competence, autonomy-supportive instruction, instructional design skills, assessment literacy, and psychological and relational awareness-were systematized through a comparative review of theoretical and empirical sources. The analysis shows that teacher readiness to support cognitive engagement develops through the combination of cognitive, motivational, and relational processes present in classroom instruction. The findings underline the importance of integrating these components into teacher education programs to strengthen future specialists' ability to recognize engagement-related behaviors and organize learning environments that encourage sustained cognitive activity. The results offer a conceptual framework for improving teacher preparation in pedagogical psychology and provide directions for further research on the development of engagement-supportive competencies.

Keywords: cognitive engagement, teacher readiness, pedagogical psychology, conceptual foundations, instructional design, metacognition.

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БОЛАШАҚ ПЕДАГОГ-ПСИХОЛОГТАРДЫҢ СТУДЕНТТЕРДІҢ ТАНЫМДЫҚ БЕЛСЕНДІЛІГІН ҚОЛДАУҒА ДАЙЫНДЫҒЫН ДАМУДЫҢ ТҰЖЫРЫМДАМАЛЫҚ НЕГІЗДЕРІ

Аңдатпа

Мақалада болашақ педагог-психолог студенттердің танымдық белсенділігін қолдауға даярлаудың тұжырымдамалық негіздері қарастырылады. Зерттеуде мәдени-тарихи теория, мотивациялық үлгілер, конструктивтік оқыту тұжырымдамалары және танымдық әрекетті сипаттайтын модельдер талданып, студенттердің оқу тапсырмаларына қатысуына ықпал ететін факторларды айқындауға негіз жасалады. Теориялық және эмпирикалық дереккөздерді салыстырмалы талдау нәтижесінде алты негізгі фактор жүйеленді: когнитивтік стратегияларды білу, метакогнитивтік құзыреттілік, автономияны қолдайтын оқыту, оқу тапсырмаларын жобалау дағдылары, бағалау сауаттылығы және психологиялық-реляциялық хабардарлық. Талдау нәтижелері педагогтың танымдық белсенділікті қолдауға дайын болуы танымдық, мотивациялық және тұлғааралық үдерістердің үйлесімді әрекетіне тәуелді екенін көрсетеді. Зерттеу қорытындылары педагог-психологтарды даярлау бағдарламаларына осы компоненттерді кіріктірудің маңызын атап өтіп, болашақ мамандардың танымдық белсенділікті қолдайтын орта құру қабілетін дамытуға бағытталған тұжырымдамалық негіз ұсынады. Сондай-ақ, когнитивтік қатысуды қолдау құзыреттерін қалыптастыруға қатысты болашақ зерттеулердің бағыттарын айқындайды.

Түйін сөздер: когнитивтік қатысу, педагогтың дайындығы, педагогикалық психология, тұжырымдамалық негіздер, оқытуды жобалау, метакогниция.

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КОНЦЕПТУАЛЬНЫЕ ОСНОВЫ РАЗВИТИЯ ГОТОВНОСТИ БУДУЩИХ ПЕДАГОГОВ-ПСИХОЛОГОВ К ПОДДЕРЖКЕ ПОЗНАВАТЕЛЬНОЙ АКТИВНОСТИ СТУДЕНТОВ

Аннотация

В статье рассматриваются концептуальные основы подготовки будущих педагогов-психологов к поддержке когнитивной вовлеченности учащихся. Анализируются ключевые теоретические подходы, включая культурно-историческую теорию, мотивационные модели, конструктивистские представления об обучении и модели когнитивной активности, которые позволяют определить факторы, влияющие на вовлеченность студентов в учебные задания. На основе сравнительного анализа теоретических и эмпирических источников систематизированы шесть основных факторов: знание когнитивных стратегий, метакогнитивная компетентность, автономно-поддерживающее обучение, навыки проектирования учебных заданий, оценочная грамотность и психологико-реляционная осведомленность. Анализ показывает, что готовность педагога поддерживать когнитивную вовлеченность формируется через сочетание когнитивных, мотивационных и межличностных процессов, присутствующих в образовательной деятельности. Полученные результаты подчеркивают необходимость интеграции данных компонентов в программы подготовки педагогов для развития у будущих специалистов способности распознавать признаки вовлеченности и организовывать образовательную среду, способствующую устойчивой когнитивной активности. Итоги исследования представляют концептуальную основу для совершенствования подготовки педагогов-психологов и определяют направления дальнейших исследований в области формирования компетенций, поддерживающих когнитивную вовлеченность.

Ключевые слова: когнитивная вовлеченность, готовность педагога, педагогическая психология, концептуальные основы, проектирование обучения, метакогниция.

Introduction. Student engagement is widely treated as a multidimensional construct describing the quality and intensity of students' involvement in learning. It includes observable participation, affective responses, and the cognitive investment that learners make when they attempt to understand, connect, and use academic material. Axelson and Flick emphasize involvement, interest, and connection with the educational environment (Axelson & Flick, 2011), while Wong and Liem describe engagement as a dynamic psychological process shaped by both personal and contextual conditions (Wong & Liem, 2022). This broader view is important because students may appear behaviorally compliant while investing little mental effort in the task.

Among the dimensions of engagement, cognitive engagement is especially relevant to the present study. Fredricks et al. distinguish cognitive engagement from behavioral and emotional engagement by linking it to strategic learning, willingness to invest effort (Fredricks et al., 2004), and persistence in intellectually demanding work. Pintrich and De Groot further connect effective academic performance with self-regulated learning processes, including the use of cognitive strategies, monitoring, and motivational regulation (Pintrich & De Groot, 1990). Greene similarly argues that cognitive engagement should be understood through the depth of students' processing and their deliberate use of strategies rather than through participation alone. Together, these studies suggest that cognitive engagement is visible not simply when students are active, but when their activity involves purposeful thinking, regulation, and meaning-making (Greene, 2015).

The emotional and motivational conditions of learning also influence whether students sustain such cognitive effort. Academic emotions can direct attention, persistence, and the willingness to continue working with difficult material (Pekrun & Linnenbrink-Garcia, 2012). Self-determination theory adds that autonomy, competence, and relatedness are central psychological conditions supporting internally regulated motivation (Ryan & Deci, 2000). From this perspective, cognitively engaging instruction should not only provide challenging tasks but should also create structured opportunities for choice, competence-building feedback, and supportive interaction. Social cognitive theory complements this account by emphasizing self-efficacy: students are more likely to persist when they believe that they can successfully manage the demands of a task (Bandura, 1997).

A second group of perspectives explains cognitive engagement through the design of learning activity. Vygotsky's cultural-historical approach highlights the role of guided participation and support within the zone of proximal development (Vygotsky, 1978), whereas constructivist perspectives emphasize active interpretation, inquiry, and the construction of meaning rather than the passive reception of information (Fosnot, 2013). The ICAP framework provides a more explicit account of differences in the depth of engagement by distinguishing passive, active, constructive, and interactive modes of learning (Chi & Wylie, 2014). These perspectives converge on the idea that the quality of a task, the form of guidance provided, and the opportunities for explanation or interaction can substantially change the level of cognitive work that students perform.

Instructional clarity and feedback constitute another important strand in the literature. Hattie identifies learning intentions, success criteria, and feedback as mechanisms that help learners understand where they are going, how they are progressing, and what they should do next (Hattie, 2008). Formative assessment can also strengthen students' agentic engagement when feedback becomes information that students use to make decisions about their own learning (Mohammadi et al., 2025). Recent evidence further shows that metacognitive ability is associated with learning engagement and can help explain how students regulate effort and avoid unproductive learning patterns (Liu et al., 2025). These findings support the view that teacher readiness for cognitive engagement must include both instructional and metacognitive dimensions.

For future pedagogue-psychologists, this issue has a dual professional significance. Their preparation involves not only understanding learning and motivation but also recognizing psychological, relational, and contextual factors that may facilitate or constrain students' participation in academic activity. The NASP Practice Model, for example, frames school psychological services as encompassing assessment, consultation, intervention, prevention, and support for academic and social-emotional functioning (National Association of School Psychologists, 2020). Although professional roles vary across national contexts, this integrated orientation is relevant to pedagogue-psychologists who work at the intersection of teaching, learning, and psychological support.

Despite the breadth of the literature, the competencies needed to support cognitive engagement are often discussed separately. Research on self-regulation focuses on cognitive and metacognitive strategies; motivational theories emphasize autonomy, competence, and self-efficacy; instructional models focus on task design, feedback, and the depth of learning activity; and psychological perspectives emphasize classroom relationships and students' emotional states. This fragmentation makes it difficult to specify which competencies should be prioritized in the preparation of future pedagogue-psychologists and how theoretical principles can be translated into observable professional readiness.

Accordingly, a conceptual synthesis is needed to connect these theoretical traditions and identify recurring components that have direct implications for teacher and pedagogue-psychologist preparation. Such a synthesis can clarify how cognitive, motivational, instructional, assessment-related, and relational processes operate together in supporting sustained engagement with academic tasks. It can also provide a basis for developing future empirical instruments and training models rather than treating cognitive engagement as the product of a single method or theory.

The aim of the present review is therefore to systematize theoretical and empirical perspectives on students' cognitive engagement and to identify the core competencies that future pedagogue-psychologists need in order to support it. The review addresses two guiding questions: (1) Which theoretical perspectives most directly explain the conditions that support students' cognitive engagement? and (2) Which recurring competencies can be derived from these perspectives for the preparation of future pedagogue-psychologists?

Materials and Methods. This study employed a conceptual literature review with a structured selection procedure to examine theoretical and empirical work on students' cognitive engagement and the preparation of future pedagogue-psychologists. The research methods used were conceptual-theoretical analysis, comparative analysis, thematic content analysis, classification, systematization, and

integrative synthesis. Conceptual-theoretical analysis was used to identify the explanatory principles of major learning and motivation theories. Comparative analysis was used to examine similarities and differences among these perspectives. Thematic content analysis was then applied to identify recurring constructs related to teacher knowledge, skills, and attitudes. Finally, classification and integrative synthesis were used to combine these constructs into a coherent framework of professional readiness.

The literature was retrieved from Scopus, Web of Science, and Google Scholar. Search terms reflected the central concepts of the review and included “student cognitive engagement,” “teacher readiness,” “self-determination theory,” “constructivist learning,” “cultural-historical theory,” “metacognition,” “formative assessment,” and “instructional design.” Foundational theoretical works were included when they provided a direct conceptual basis for the constructs under analysis, while priority among empirical sources was given to peer-reviewed studies relevant to cognitive engagement, self-regulation, motivation, feedback, and teacher preparation. Sources were excluded when they did not address educational engagement, did not contribute to the conceptual framework, or lacked sufficient scholarly relevance for the review objective.

The selection process was organized according to the identification, screening, eligibility, and inclusion stages of the PRISMA approach (Moher et al., 2009). As reported in Figure 1, records identified in the selected databases were screened for relevance, full texts were assessed against the review criteria, and 24 studies were retained for the final conceptual synthesis. PRISMA was used to document the selection logic, whereas the analytical stage of the study was qualitative and conceptual rather than meta-analytic.

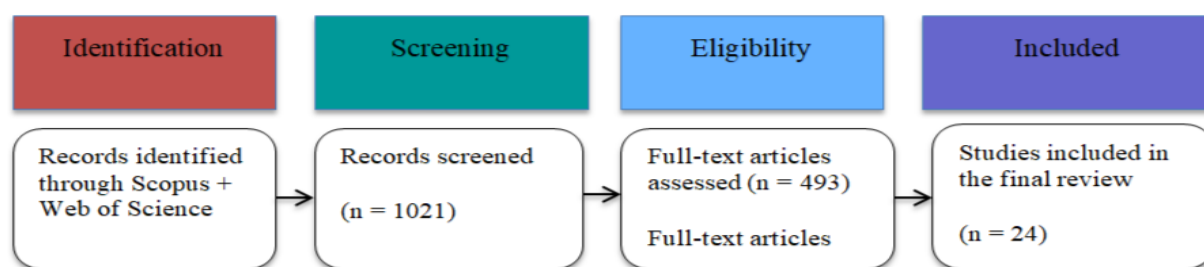


Figure 1. PRISMA flow diagram (adapted from Moher et al., 2009).

During thematic content analysis, statements describing conditions that enable or constrain cognitive engagement were coded according to their primary function: cognitive-strategic, metacognitive, motivational, instructional, assessment-related, or psychological-relational. Similar codes were grouped into higher-order categories, and categories were compared across theoretical perspectives to determine whether they represented recurring components of professional readiness rather than theory-specific terminology.

This procedure made it possible to move from individual theoretical principles to a synthesized conceptual framework. A factor was retained when it appeared consistently across the reviewed perspectives and could be translated into a professional competency relevant to the work of future pedagogue-psychologists. The resulting categories were then interpreted in relation to teacher preparation and the practical organization of learning environments that support sustained cognitive activity.

Results and Discussion. The analysis of the selected literature identified a set of complementary conceptual perspectives that explain students’ cognitive engagement and clarify their relevance for preparing future pedagogue-psychologists. Although the theories differ in terminology and level of analysis, together they describe cognitive, motivational, instructional, and social-relational mechanisms that shape how students approach academic tasks. Their core principles were compared to determine how each perspective contributes to professional competencies required for supporting cognitive engagement.

The results of the theoretical analysis are presented in Table 1, which brings together ten perspectives commonly discussed in educational psychology and teacher preparation.

Table 1. Theoretical perspectives and implications for teacher readiness

Theory	Key Elements	Implications for Teacher Readiness	Source
1. Vygotsky's Cultural-Historical Theory	zone of proximal development; support in learning; interaction with others.	Identifying students' independent abilities, providing structured assistance, adjusting guidance as learning progresses.	(Vygotsky, 1978)
2. Bloom–Anderson Taxonomy	remembering; understanding; applying; analyzing; evaluating; creating.	Teachers choose tasks that correspond to different types of thinking, relate these tasks to the intended results of a lesson, and help students move from basic recall toward more complex operations.	(Anderson & Krathwohl, 2001)
3. Information Processing Theory	Attention, working memory, encoding, cognitive load.	Sequencing material to reduce load, highlighting essential information, supporting step-by-step processing.	(Atkinson & Shiffrin, 1968)
4. Social Cognitive Theory	Observation, belief in one's capability; regulation of actions.	Modelling strategies, adjusting task difficulty, creating opportunities for students to observe effective approaches.	(Bandura, 1997)
5. Self-Determination Theory	autonomy; competence; relationships; motivation shaped by internal needs.	Offering structured choices, clarifying expectations, maintaining interactions that support participation.	(Ryan & Deci, 2000)
6. Constructivist Learning Theory	Inquiry, interpretation, comparison, active knowledge building.	Creating tasks requiring analysis, guiding inquiry through questions, organizing reflection.	(Fosnot, 2013).
7. Engagement Theory	Collaboration, contribution, purposeful activity.	Structuring group work, coordinating shared tasks, linking activities with practical outcomes.	(Kearsley & Shneiderman, 1998)
8. Mindset Theory	Growth mindset, response to difficulty, learning orientation.	Providing process-focused feedback, helping students review errors, supporting continued work with challenging tasks.	(Dweck, 2006).
9. Visible Learning	Learning intentions, success criteria, feedback.	Stating goals, communicating criteria, giving feedback that informs next steps.	(Hattie, 2008)
10. ICAP Framework	Passive, active, constructive, interactive modes of engagement.	Designing tasks that require explanation, creation, or discussion; revising activities when engagement remains low.	(Chi & Wylie, 2014)

Table 1 brings together ten perspectives that are frequently used to explain learning, motivation, and engagement. The purpose of the synthesis is not to present a strict chronology, but to show how different theoretical traditions contribute distinct yet complementary explanations of the conditions under which students invest cognitive effort in learning.

One recurring theme is the need to calibrate instructional support to students' current capabilities. Vygotsky's perspective emphasizes guided support that extends what learners can accomplish independently (Vygotsky, 1978), while constructivist approaches emphasize inquiry and active meaning-making (Fosnot, 2013). The Bloom–Anderson taxonomy provides a practical language for designing tasks that move from basic recall toward analysis, evaluation, and creation (Anderson & Krathwohl, 2001). Together, these perspectives indicate that cognitive engagement is influenced by how tasks are structured and how support is gradually adjusted.

Motivation forms a second major theme. Across the reviewed perspectives, autonomy, competence, self-efficacy, and beliefs about learning are repeatedly linked with persistence and effort. Self-determination theory explains why structured choice and competence-supportive conditions can strengthen engagement (Ryan & Deci, 2000), while social cognitive theory emphasizes students' beliefs about their capability to manage academic demands (Bandura, 1997). Mindset theory adds that interpretations of difficulty can influence whether students treat challenge as a reason to withdraw or as an opportunity to continue learning (Dweck, 2006).

A third theme concerns the social and interactive organization of learning. Engagement theory emphasizes collaboration and purposeful activity (Kearsley & Shneiderman, 1998), whereas the ICAP framework differentiates passive, active, constructive, and interactive modes of engagement according to the cognitive contribution required from learners (Chi & Wylie, 2014). Visible Learning adds the

importance of clear goals, success criteria, and feedback for directing attention toward productive next steps (Hattie, 2008). These frameworks show that participation becomes cognitively meaningful when learners explain, generate, compare, discuss, and revise ideas rather than merely complete visible actions.

Viewed together, these perspectives suggest that readiness to support cognitive engagement cannot be reduced to mastery of one instructional technique. It requires the ability to diagnose the cognitive and motivational demands of a learning situation, select appropriate forms of support, design tasks that require meaningful mental activity, provide feedback that guides improvement, and maintain relational conditions that allow students to persist. The synthesis therefore shifts the focus from isolated methods to a coordinated set of professional competencies.

The figure below summarizes the key factors that shape teacher readiness to support students' cognitive engagement and outlines their relevance for the preparation of future pedagogue-psychologists. These factors reflect different dimensions of professional competence, including knowledge of learning strategies, the ability to guide students' thinking, the creation of motivational conditions, and awareness of classroom interactions. Together, they form the foundation for instructional practices that encourage sustained cognitive involvement in learning activities (Figure 2).

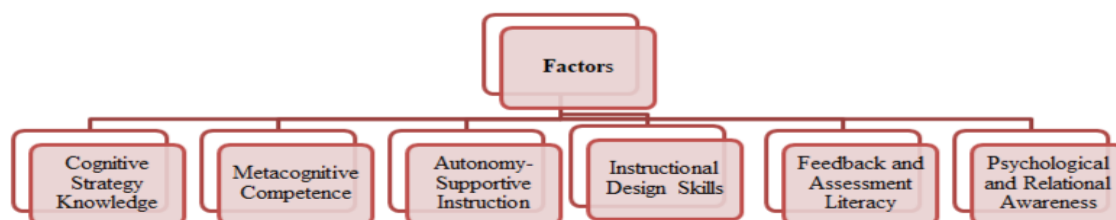


Figure 2. Key factors influencing teacher readiness to support students' cognitive engagement

The factors illustrated in the diagram were derived from a systematic examination of theoretical and empirical sources in educational psychology, pedagogy, and teacher preparation. During the analysis, recurring elements associated with teachers' influence on students' cognitive engagement were identified across different theoretical frameworks and research findings. As a result, six factors were distinguished as the core components that consistently appeared in the literature and demonstrated relevance to the preparation of future pedagogue-psychologists.

Cognitive Strategy Knowledge emerged as a foundational component because students' work with complex material depends partly on whether they possess strategies for organizing, connecting, rehearsing, and elaborating information. Research on self-regulated learning shows that strategic learning is associated with stronger academic engagement and performance (Pintrich, De Groot, 1990). For future pedagogue-psychologists, this factor implies the ability to recognize ineffective learning strategies and to support teachers and students in selecting more productive cognitive approaches.

Metacognitive Competence was identified because cognitive engagement requires learners to plan, monitor, and evaluate their own thinking. Greene notes that cognitive engagement is closely tied to deliberate strategy use and regulation (Greene, 2015), while recent empirical evidence indicates that metacognitive ability is positively associated with learning engagement (Liu et al., 14). This factor therefore includes the future specialist's capacity to model reflection, use metacognitive prompts, and help students evaluate whether their current approach is effective.

Autonomy-Supportive Instruction was retained because students are more likely to sustain effort when they experience meaningful choice, competence, and supportive relationships. Self-determination theory provides the central conceptual basis for this factor (Ryan & Deci, 2000). In practice, autonomy support does not mean the absence of structure; rather, it involves clear expectations combined with opportunities for students to make relevant decisions, explain preferences, and take increasing responsibility for their learning.

Instructional Design Skills were included because the cognitive demands built into a task determine what kind of engagement becomes possible. The Bloom–Anderson taxonomy supports the progression from lower-order to higher-order thinking (Anderson & Krathwohl, 2001), while the ICAP framework shows that activities requiring learners to generate explanations, construct products, or interact around ideas are associated with deeper forms of cognitive engagement than passive reception (Chi & Wylie, 2014). This factor therefore concerns the ability to align tasks, guidance, and expected cognitive processes.

Feedback and Assessment Literacy emerged as a core factor because feedback can direct attention, clarify performance standards, and support strategic adjustment. Hattie emphasizes the role of learning intentions, success criteria, and feedback in making next steps visible to learners (Hattie, 2008). Empirical work on formative assessment further suggests that feedback can strengthen students' agentic engagement when they are able to use information to make decisions about their learning (Mohammadi et al., 2025). For future pedagogue-psychologists, this factor includes understanding how assessment practices influence motivation, self-monitoring, and continued cognitive effort.

Psychological and Relational Awareness was identified because cognitive engagement develops within emotional and interpersonal conditions rather than in isolation. Academic emotions influence attention and persistence (Pekrun & Linnenbrink-Garcia, 2012), and school psychological practice explicitly connects academic functioning with social-emotional and relational support (National Association of School Psychologists, 2020). This factor therefore refers to the ability to recognize emotional or relational barriers to engagement and to support classroom conditions in which students feel sufficiently secure and connected to invest effort in learning.

Taken together, the six factors represent an integrated analytical result in which constructs from different theoretical traditions converge at the level of professional practice. They were retained because each factor appeared across multiple perspectives and could be expressed as a competency that future pedagogue-psychologists may need in order to support students' cognitive engagement. The framework therefore links theory with preparation by specifying what future specialists should know, notice, and be able to facilitate in educational settings.

The framework should be interpreted as a conceptual model rather than as a contextually validated measurement instrument. Its practical value lies in offering a structured basis for curriculum design, observation protocols, competency indicators, and future empirical studies. In particular, subsequent research should test whether the six factors show the same structure and relative importance in specific national and institutional contexts, including teacher-education and pedagogue-psychology programs in Kazakhstan. Such validation is necessary before claims are made about the prevalence or strength of these competencies in local practice.

Conclusion. This study examined the conceptual foundations relevant to preparing future pedagogue-psychologists to support students' cognitive engagement. Through conceptual-theoretical, comparative, thematic, and integrative analysis of the selected literature, six factors were identified as central components of professional readiness: cognitive strategy knowledge, metacognitive competence, autonomy-supportive instruction, instructional design skills, feedback and assessment literacy, and psychological and relational awareness. Together, these factors show that cognitive engagement is shaped through the interaction of cognitive, motivational, instructional, assessment-related, and relational processes.

Although the analysis is theoretical, the consolidation of different perspectives creates a basis for formulating models suitable for empirical examination. The framework presented here may inform the development of interventions and observation tools aimed at studying how the identified factors appear in classroom practice.

Some limitations should be taken into account when considering the results. There remains a need for methods that allow cognitive engagement to be observed consistently during regular instruction. The approaches discussed may also work differently across cultural settings where norms of teacher–student interaction vary. Following teachers over time after they have been trained with this framework could

help assess how it functions in practice and identify areas in teacher education that may require further refinement.

Overall, the findings offer a structured basis for strengthening teacher education in pedagogical psychology and point to future avenues for developing evidence-based approaches to supporting students' cognitive engagement.

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