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The Cognitive Model for Improving the Professional Competence of Future Primary School Teachers

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Abstract: This article explores the development of a cognitive model aimed at improving the professional competence of future primary school teachers. The study emphasizes the significance of cognitive components—such as knowledge, thinking strategies, and problem-solving skills—in shaping effective teaching practices. The proposed model integrates theoretical and practical aspects of teacher training, focusing on enhancing pedagogical awareness, critical thinking, and independent learning capabilities. Based on an analysis of current pedagogical research and educational needs, the article suggests a structured approach to developing cognitive competencies that directly impact classroom performance and professional growth.

Key words: professional competence, cognitive model, future primary school teachers, teacher training, pedagogical thinking, critical thinking, independent learning, education methodology.

In the rapidly evolving field of education, the role of primary school teachers is becoming increasingly multifaceted and demanding. Future educators are expected not only to possess a strong foundation in subject knowledge but also to demonstrate high levels of professional competence, including the ability to think critically, solve pedagogical problems creatively, and apply effective teaching strategies in real classroom contexts. These competencies are crucial in shaping students' cognitive, emotional, and social development at an early age.

In this regard, the development of a cognitive model for enhancing the professional competence of prospective primary school teachers is of vital importance. Cognitive competence involves the integration of knowledge, intellectual skills, reflective thinking, and decision-making abilities. Therefore, the training process should be structured in a way that supports cognitive engagement, promotes autonomous learning, and fosters the ability to adapt to diverse educational challenges.

This study addresses the need for a comprehensive cognitive model that aligns with contemporary pedagogical theories and practices. The model aims to provide a systematic framework for teacher education institutions to develop key cognitive and professional skills among student-teachers. Furthermore, it emphasizes the importance of linking theoretical content with practical experience through student-centered, interactive, and problem-based learning approaches.

By analyzing existing literature and current challenges in teacher preparation, this paper proposes a cognitive model that contributes to the continuous improvement of teacher education programs. The model is designed to support the development of highly competent, reflective, and adaptive educators who can meet the educational demands of the 21st century.

The concept of professional competence in teacher education has been the subject of extensive scholarly research. Shulman (1987) was among the first to propose the idea of *pedagogical content knowledge*, which emphasized the integration of subject expertise and the ability to convey that knowledge effectively. His framework laid the foundation for a more holistic understanding of teacher competence, including cognitive, affective, and practical dimensions.

Subsequent research by Darling-Hammond and Bransford (2005) reinforced the need for teacher education programs to develop not only theoretical knowledge but also critical thinking, decision-making, and reflective practice. These cognitive elements are essential for preparing teachers who can function effectively in complex classroom environments. Vygotsky's (1978) sociocultural theory further supports the idea that cognitive development is a socially mediated process, highlighting the role of interaction and collaboration in the learning process.

In recent years, the focus has shifted toward developing cognitive models in teacher education. These models emphasize the mental processes involved in planning, instruction, and assessment. Brown (2007) and Nunan (1991) underline the importance of metacognitive skills, such as self-regulation and reflective thinking, in shaping effective educators. They argue that without cognitive engagement, professional growth remains superficial and ineffective.

Within the Uzbek context, Azizxo'jaeva (2004) highlights the importance of pedagogical technology and teaching skills as foundational elements of teacher competence. Jumaniyozova (2020) and Yusupov (2021) point to the need for a competency-based approach in primary education, particularly through the development of language and communication skills in mother tongue lessons. These researchers suggest that the subject of "Mother Tongue" plays a crucial role in developing students' and future teachers' cognitive and linguistic abilities.

Moreover, the State Education Standards of Uzbekistan (2017) underscore the need for future teachers to master independent learning strategies and creative thinking, which are inherently cognitive. Shokirov (2025) presents a structured approach to enhancing independent professional competence among pre-service primary teachers, advocating for the incorporation of modular-credit systems and self-directed tasks in teacher training programs.

Overall, the literature suggests that a cognitive model for improving professional competence should incorporate the following components: subject-specific knowledge, pedagogical thinking, problem-solving ability, metacognitive awareness, and the capacity for reflective practice. These competencies are not developed in isolation but through well-structured educational environments that foster active learning, mentorship, and continuous assessment.

The study was conducted to explore how the implementation of a cognitive model can contribute to the development of professional competence among future primary school teachers. A mixed-methods approach was employed, including theoretical analysis, observation of pedagogical practices, and interviews with pre-service teachers and pedagogical mentors at teacher training institutions.

Data collected from a group of 120 pre-service teachers enrolled in a pedagogical university revealed several key trends. Before the intervention of the cognitive model, many students demonstrated surface-level knowledge and a fragmented understanding of professional teaching competencies. They tended to rely heavily on memorization, with limited application of critical thinking or reflection in their lesson planning or instructional methods.

After introducing the cognitive model—which emphasized active learning, metacognitive strategies, problem-solving tasks, and reflective practice—there was a notable improvement in several areas:

1. **Cognitive engagement increased** significantly. More than 78% of the students reported that using cognitive strategies such as self-questioning, lesson analysis, and peer feedback helped them better understand and apply pedagogical principles.
2. **Lesson planning quality improved.** Compared to the pre-intervention stage, post-intervention lesson plans were more student-centered, included more creative tasks, and demonstrated an improved integration of pedagogical goals with teaching methods.

3. **Professional confidence rose.** Through guided reflection and collaborative learning, pre-service teachers reported increased confidence in classroom management and instructional delivery.
4. **Metacognitive awareness strengthened.** Interviews and reflective journals revealed that students began actively evaluating their own teaching methods, identifying areas for improvement, and setting professional development goals—an important indicator of cognitive maturity.

Quantitative results showed that **academic performance and practical teaching assessments improved by an average of 21%** following the implementation of the cognitive model. These findings suggest that cognitive development strategies can lead to measurable improvements in both theoretical understanding and practical teaching skills.

Furthermore, qualitative data indicated that the **integration of “Mother Tongue” lessons as a platform for developing communication, cultural literacy, and critical thinking** was particularly effective. These lessons served as a practical context in which the cognitive model could be applied and evaluated, reinforcing the centrality of language in cognitive and professional growth.

In conclusion, the analysis confirms the positive impact of a cognitive-based approach on the professional development of future primary school teachers. The results support the need for teacher training institutions to move beyond traditional lecture-based instruction and adopt models that engage cognitive, reflective, and autonomous learning processes.

The study has demonstrated that developing a cognitive model significantly contributes to enhancing the professional competence of future primary school teachers. The integration of cognitive strategies—such as critical thinking, reflection, problem-solving, and metacognitive awareness—into teacher training programs promotes deeper understanding, independent learning, and pedagogical adaptability.

By embedding these cognitive components within subject-based instruction, particularly in “Mother Tongue” lessons, future educators are better equipped to manage classroom dynamics, design effective lesson plans, and respond to diverse student needs. The results confirm that a structured cognitive model fosters professional confidence, intellectual engagement, and readiness for real-world teaching challenges.

Moreover, the study underlines the necessity for educational institutions to revise traditional teacher preparation methods. There is a clear need for interactive, student-centered, and reflective approaches that support the cognitive and professional growth of teacher candidates.

In conclusion, the proposed cognitive model serves as an effective tool for transforming teacher education practices, and its adoption can lead to the development of more competent, innovative, and responsible primary school educators.

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