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CREATING A KNOWLEDGE BASE FOR PEDAGOGICAL RESEARCH AMONG FUTURE TEACHERS IN THE PROCESS OF SCIENTIFIC ACTIVITY

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ABSTRACT: *The development of a knowledge base for pedagogical research among future teachers is a key factor in improving the quality of teacher education and advancing pedagogical science. The modern educational environment demands that future teachers not only master methodological and subject knowledge but also acquire research competencies that enable them to generate, organize, and apply knowledge in solving pedagogical problems. This article examines the theoretical and methodological foundations of forming a pedagogical research knowledge base, identifies its structural components, and explores the mechanisms of its integration into the professional training of future teachers. The research emphasizes the importance of cognitive, methodological, and digital literacy for developing scientific and pedagogical thinking. The article also outlines practical recommendations for implementing an effective system that supports research-based learning and innovative teacher education.*
KEYWORDS: *pedagogical research, future teachers, knowledge base, research competence, scientific activity, professional development, innovation in education*

In the context of rapid social, technological, and cultural transformations, the professional training of future teachers is expected to meet new standards of scientific and pedagogical literacy. Teachers are not only transmitters of knowledge but also creators of new pedagogical ideas and models. Consequently, the process of forming a knowledge base for pedagogical research becomes one of the most important components of modern teacher education.

Scientific activity in higher pedagogical education serves as a medium through which students develop critical thinking, analytical skills, creativity, and the ability to make informed pedagogical decisions. The creation of a structured and dynamic knowledge base enables future teachers to integrate theoretical understanding with empirical experience, thus ensuring a holistic view of the teaching and learning process.

Theoretical Foundations of the knowledge base. The term knowledge base in the context of pedagogical research refers to a systematically organized set of scientific concepts, methodological approaches, empirical data, and pedagogical experiences that guide the research activities of future teachers.

The theoretical foundation rests upon several interrelated scientific domains:

- Pedagogy and didactics – providing the conceptual framework for understanding teaching and learning processes.

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- Epistemology – defining the nature and sources of pedagogical knowledge.
- Research methodology – outlining procedures for data collection, analysis, and interpretation.
- Cognitive psychology – offering insights into how individuals process and apply information.
- Information and communication technologies (ICT) – enabling digital access, storage, and dissemination of research data.

The knowledge base serves not only as a repository of information but also as an active cognitive system that promotes knowledge creation, transformation, and application within educational contexts.

Components of the pedagogical research knowledge base. The structure of a pedagogical research knowledge base for future teachers includes several interdependent components:

1. Conceptual-methodological component

This includes basic pedagogical concepts, theories, paradigms, and models of teaching and learning. Future teachers must understand classical and contemporary pedagogical theories to critically analyze educational phenomena and propose research hypotheses.

2. Empirical-analytical component

It covers the collection, organization, and interpretation of data obtained through experiments, observations, surveys, and case studies. Developing competence in empirical methods allows students to validate theoretical assumptions with factual evidence.

3. Technological component

Modern pedagogical research requires mastery of digital tools for statistical analysis, data visualization, academic writing, and publication. The use of databases, reference managers, and research platforms fosters efficiency and accuracy.

4. Communicative-reflective component

Scientific communication and reflection are central to the research process. Future teachers should be capable of presenting findings, engaging in academic discussions, and evaluating their own and others' research outcomes critically.

5. Ethical component

Scientific integrity and adherence to ethical norms—such as honesty, respect for intellectual property, and responsible data handling—form the moral foundation of all research activity.

Formation of research competence through knowledge base development

The process of creating a knowledge base directly contributes to the formation of research competence in future teachers. This competence comprises several skills:

- the ability to identify research problems in educational practice;
- the capacity to design and conduct pedagogical experiments;
- the proficiency in data processing and interpretation;
- the readiness to draw pedagogical conclusions and implement innovations.

Developing a knowledge base provides a scaffold for systematic thinking. It encourages learners to connect disparate pieces of knowledge into coherent frameworks and apply them in real-world teaching contexts. Integrating research training into the teacher education curriculum transforms students from passive consumers of information into active participants in scientific inquiry.

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Integration of scientific activity into teacher education. Integrating research activities into the educational process can take multiple forms:

- Course-based research projects: Embedding mini-research assignments within pedagogical disciplines.
- Research seminars and conferences: Encouraging presentation and discussion of student findings.
- Mentorship and collaborative research: Pairing students with academic supervisors for guided research practice.
- Digital knowledge platforms: creating online repositories for sharing student projects, articles, and databases.

Such integration ensures the continuity between learning and research, thereby fostering an academic culture in teacher education institutions.

Digital and cognitive aspects of knowledge base development

The digital transformation of education offers new opportunities for the creation and management of pedagogical knowledge. Cloud technologies, online research databases, and AI-assisted analysis tools allow future teachers to access a global corpus of educational studies and datasets.

At the same time, cognitive approaches highlight the importance of metacognitive awareness — understanding one's own thinking and learning strategies — as a critical aspect of scientific literacy. The digital knowledge base must therefore support not only the accumulation of facts but also the development of critical and reflective cognitive habits.

Challenges and perspectives. Despite the clear benefits, several challenges hinder the effective creation and use of pedagogical research knowledge bases:

- insufficient methodological training of students;
- limited access to digital research resources;
- lack of institutional support for research-oriented education;
- insufficient motivation and research culture among students and teachers.

Addressing these challenges requires systemic solutions: modernization of curricula, investment in digital infrastructure, continuous professional development of educators, and the promotion of research-based learning as a pedagogical principle.

Conclusion. The formation of a knowledge base for pedagogical research among future teachers is not a single-stage process but a continuous and dynamic phenomenon that evolves throughout professional education. It combines cognitive, methodological, and technological dimensions, providing the foundation for innovative and evidence-based teaching.

By fostering research competencies, reflective thinking, and scientific curiosity, higher education institutions can prepare teachers who are capable not only of transmitting knowledge but also of transforming the educational landscape through research and innovation.

Thus, the creation of a knowledge base for pedagogical research should be considered a strategic priority in modern teacher education, ensuring the development of a new generation of educators—scientifically literate, methodologically competent, and capable of lifelong learning.

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