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Developing Prospective Teachers' Methodological Preparedness In Digital Education Environments

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ABSTRACT

This article discusses the issues of mastering the priority aspects of digital education in the current era of globalization and developing an effective education system by integrating digital technology tools into the teaching process by prospective teachers. The article also examines research on the TPACK model and Churches' Taxonomy, which is a digital version of Bloom's Taxonomy. The research findings are aimed at developing the digital competence of prospective teachers and improving their methodological preparedness.

Keywords: Digital education, informatization of education, TPACK model, virtual classrooms, Flipped Classroom technology, media literacy, Micro-learning concept.

INTRODUCTION

Developing the methodological preparedness of prospective teachers in digital education environments is currently considered one of the most pressing areas of the education system. The rapid development of information and communication technologies is fundamentally transforming traditional teaching paradigms, requiring teachers not only to have a thorough knowledge of their subjects but also to manage knowledge transfer through sophisticated digital tools.

Several international conceptual approaches are applied in the theoretical study of this issue. The theory of connectivism, developed by George Siemens and Stephen Downes, explains the networked nature of the knowledge acquisition process in the digital age. According to this theory, knowledge is formed not only in the human mind but also through connections between information nodes and technological systems. Therefore, the methodological preparation of prospective teachers should focus on developing students' skills in filtering information flows and constructing new meanings.

Literature Review

The TPACK model, developed by Punya Mishra and Matthew Koehler, considers teachers' preparedness as an integrated synthesis of technological, pedagogical, and content knowledge. According to this model, teachers should be able to provide a methodological justification for selecting the most effective digital tool to explain a particular topic.

Russian scholar I. V. Robert developed the didactic principles of the informatization of education. She prioritizes methods of algorithmizing the pedagogical process, introducing intelligent technologies, and managing learning activities through automated systems. The local scholar N. A. Muslimov, analyzing innovative and technological preparedness as a component of pedagogical competence, emphasizes the need for prospective teachers to adopt a creative approach when designing lessons in a digital environment.

The development of methodological preparedness in a digital environment is associated with the media literacy of prospective specialists. In this process, new tasks emerge, such as preparing lessons in the form of storytelling or visualization, using virtual and augmented reality (VR/AR) technologies for methodological purposes, and monitoring students' learning outcomes based on Big Data analytics.

In modern higher pedagogical education institutions, Flipped Classroom technology and the Micro-learning concept play an important role in developing students' methodological preparedness. Through these approaches, students learn to independently master educational materials in digital formats and solve practical and methodological problems during lessons, thereby strengthening the teacher's role as a facilitator.

The use of artificial intelligence systems in developing the methodological preparedness of prospective teachers is also opening up new prospects. For example, methods of rapidly creating lesson plans, designing individualized learning trajectories, and automating assessment criteria with the help of generative models such as ChatGPT are becoming essential skills for today's teachers. However, the proper interpretation of pedagogical ethics and digital security issues is also important in this process.

The analyses conducted indicate that if digital tools are not subordinated to pedagogical objectives, they may remain merely presentation tools. Therefore, in preparing prospective teachers, priority should be given not to teaching technological tools themselves but to teaching methodologies for imparting knowledge through technology. After all, any digital platform contributes to the quality of education only when it is built on the foundations of pedagogical design.

Research Methodology: The study examines the development of prospective teachers' methodological preparedness through digital technologies using theoretical and comparative-analytical approaches. Regulatory and legal documents, scientific articles, and methodological literature related to the topic were analyzed. The capabilities of digital educational technologies, their role in

the pedagogical process, and their effectiveness were summarized based on scientific sources. Systematic, logical, and comparative methods were used in the analysis.

Results. According to the findings, the effective application of digital technologies in the education sector of the republic ensures that learners keep pace with contemporary developments. In this process, developing prospective teachers' competencies in using digital technologies is of great importance. Based on the studies examined during the preparation of the article, it was determined that several scientific theories and practical experiences also require in-depth investigation. For example, Andrew Churches' views on the digital interpretation of Bloom's Taxonomy demonstrate its significance for assessing and developing students' knowledge levels in digital education. Churches' theory makes it possible to examine how digital tools can be used to develop students' higher-order thinking skills.

Karl Kapp's views on gamification offer new methods for motivating students and improving educational effectiveness by incorporating game elements into the learning process. Kapp's research provides important insights into how game mechanics can be integrated into education. It is also necessary to conduct a comparative analysis of the pedagogical experiences of foreign countries, such as Finland and Singapore, examine their approaches to digital education, and identify opportunities for adapting them to the local education system. The Finnish education system is renowned for teachers' autonomy and innovative approaches, while Singapore is distinguished by its high standards and success in implementing digital technologies. Introducing mathematical models for the implementation of digital didactics in higher education is also important. Such models help calculate and evaluate the effectiveness of the educational process and offer new approaches to determining students' levels of academic achievement.

Conclusion

Developing methodological preparedness in digital education environments is a process of continuous professional development for prospective teachers, encompassing complex intellectual activities such as analyzing global educational trends, critically evaluating innovative technologies, and adapting them to the specific characteristics of academic subjects. This process serves as a key factor in ensuring the competitiveness of the education system.

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