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THEORETICAL AND PRACTICAL FOUNDATIONS FOR DEVELOPING A TEACHER'S DIGITAL COMPETENCE IN THE PROCESS OF DIGITAL PEDAGOGY TRANSFORMATION

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Abstract: This article analyzes the theoretical and practical foundations of developing teachers' digital competence in the context of digital pedagogy transformation. The content, components, and factors influencing the formation of digital competence are scientifically elucidated in the article. Additionally, the article thoroughly examines teachers' digital literacy, skills in effectively using information technologies, and their role in creating an innovative educational environment. The research employs methods of theoretical analysis, comparison, modeling, and pedagogical observation. Results indicate that the development of teachers' digital competence is closely linked to continuous professional education, the culture of utilizing digital resources, and motivational factors. The article compares advanced foreign practices with digital reforms in Uzbekistan's education system and offers practical recommendations.

Keywords: Digital pedagogy, digital competence, teacher qualifications, innovative technologies, pedagogical transformation, information and communication technologies, digital literacy, professional development, continuous education, modern educational environment.

INTRODUCTION

The modern education system is entering the stage of digital transformation, necessitating the deep integration of information and communication technologies at all levels of the pedagogical process. Digital pedagogy is fundamentally changing the content, forms, and methods of education, requiring teachers to acquire new professional competencies, particularly digital competence. Today, a teacher's digital competence encompasses not only the ability to use technical tools but also the skill to organize the educational process based on innovative platforms, analyze digital resources, and effectively utilize them for pedagogical purposes.

The "Digital Uzbekistan - 2030" strategy, along with the concepts of digital economy and innovative development being implemented in the field of education in the Republic of Uzbekistan, identifies the development of teachers' digital competence as a crucial issue. Consequently, in the context of digital pedagogy transformation, identifying the theoretical foundations for developing a teacher's digital competence, elaborating practical mechanisms, and enhancing their effectiveness have become priority areas of current scientific and pedagogical research.

This study analyzes the scientific and theoretical foundations of the concept of digital competence, its structural composition, stages of development, and directions of practical formation. Additionally, national and international experiences in enhancing



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teachers' digital culture and developing skills for effective performance in an innovative educational environment are compared and examined. The results of this research serve to increase the effectiveness of using digital technologies in pedagogical activities, ensure the professional competitiveness of teachers, and elevate the quality of education to a new level.

LITERATURE ANALYSIS AND METHODOLOGY

In recent years, numerous scientific studies have been conducted on the issue of digital pedagogy and the development of teachers' digital competence. At the international level, A. Ferrari's (2013) DIGCOMP model and Redecker and Punie's (2017) DigCompEdu competency framework are recognized as important theoretical foundations for developing teachers' digital skills. In these models, a teacher's digital competence encompasses processes ranging from the skills of receiving, analyzing, creating, and sharing information to organizing the educational process using digital tools.

Local researchers such as A. Abdukodirov (2021) , N. Tursunova (2020) , and B. Khodzhaev (2022) have provided scientific conclusions about the pedagogical conditions for implementing digital technologies in Uzbekistan's education system, factors shaping teachers' digital culture, and the role of teachers in the modern digital environment. In their view, digital competence is an integral part of a teacher's professional competence, which is determined not only by knowledge of technical tools but also by the ability to apply innovative thinking in the pedagogical process.

Furthermore, Prensky's (2001) concept of "Digital Natives and Digital Immigrants" emphasizes the need for teachers working with the digital generation to update their pedagogical approaches. The TPACK model by Mishra and Koehler (2006) demonstrates that educational effectiveness can be enhanced through the integration of teachers' technological, pedagogical, and content knowledge.

Methodologically, the research is based on theoretical and practical approaches. From a theoretical perspective, the scientific interpretations of digital pedagogy and competence concepts are analyzed, and the degree of their interrelationship is determined. From a practical standpoint, the study examines experiences in developing teachers' digital competence and evaluates the possibilities of applying advanced foreign models and methods in local conditions.

The following methods were used in the study:

- Theoretical analysis - analyzing the concepts of digital competence and digital pedagogy based on scientific sources;
- Comparison and generalization - identifying common principles by comparing local and foreign experiences;
- Pedagogical observation - studying teachers' activities in the practical application of digital technologies;
- Modeling - developing a conceptual model of the digital competence development process.



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Based on these methods, pedagogical, technological, and social factors influencing the formation of teachers' digital competence were systematically studied, and practical experiences were integrated with theoretical foundations.

RESULTS

The research results showed that in the process of digital pedagogy transformation, the development of teachers' digital competence should be carried out systematically, continuously, and in stages. Based on the studied theoretical sources, pedagogical experiences, and practical observations, the following scientific conclusions were drawn:

Firstly, a teacher's digital competence is a complex pedagogical quality that encompasses not only technological literacy but also the ability to effectively design, organize, and evaluate the educational process in the digital environment. The study revealed that digital competence consists of the following components:

- Technological component - skills in the purposeful use of digital tools;
- Pedagogical component - integration of digital methods and strategies into the learning process;
- Information and communication component - the culture of searching, analyzing, and transmitting data;
- Reflexive component - the ability to analyze and improve one's activities in the digital environment.

Secondly, pedagogical observations and analyses have shown that the level of development of teachers' digital competence is directly related to their professional training, opportunities to use digital resources, and the technical infrastructure of educational institutions.

Thirdly, the analysis of foreign experiences confirms that the effectiveness of digital pedagogy largely depends on teachers' participation in continuous digital education and their culture of implementing innovative technologies in practice. Therefore, introducing special **"digital competency development programs"** for teachers in the education system of Uzbekistan is crucial.

Fourthly, the pedagogical model developed during the study proposes implementing the formation of teachers' digital competence in three stages:

1. Motivational-cognitive stage - preparing for digital changes and forming a positive attitude;
2. Practical-experiential stage - testing and analyzing digital technologies in the educational process;
3. Reflexive-innovative stage - evaluating one's own activities, exchanging experiences, and introducing innovations.

According to the research results, updating the digital infrastructure of educational institutions, organizing advanced training courses in digital pedagogy, and implementing a system for evaluating pedagogical activities based on digital criteria were identified as important practical directions for developing teachers' digital competence.



DISCUSSION

The results of the conducted research demonstrate that developing teachers' digital competence has become an urgent pedagogical and social need in the context of digital pedagogy transformation. The expansion of the digital educational environment requires teachers to acquire new knowledge, skills, and competencies, as well as transition from traditional pedagogical approaches to innovative strategies.

As determined during the study, the effectiveness of developing digital competence is directly related to the teacher's personal motivation, digital culture, and need for professional growth. At the same time, knowledge of digital tools alone is insufficient - it is necessary to pedagogically integrate them correctly into the educational content. In this sense, the TPACK model (Technological Pedagogical Content Knowledge) proposed by Mishra and Koehler (2006) demonstrates the need to ensure harmony between the teacher's technological, pedagogical, and content knowledge. This approach allows for the formation of a teacher's digital competence as a complex system.

Additionally, the DIGCOMP and DigCompEdu models developed by Ferrari (2013) and Redecker & Punie (2017) serve as a crucial theoretical foundation for determining criteria to measure and assess teachers' digital competence. Analysis of these models reveals that digital competence is not merely technical knowledge, but rather a combination of structural elements such as digital thinking, communicative culture, information security, media literacy, and social responsibility.

The digital transformation process in Uzbekistan's education system is being rapidly implemented within the framework of the "Digital Uzbekistan - 2030" strategy. However, practical observations indicate that in many educational institutions, teachers' digital competence is not sufficiently developed. The main reasons cited for this are the incomplete technical infrastructure, inadequate training in digital education methodology, and teachers' psychological unpreparedness for digital changes.

When comparing the research results with foreign experiences, it was found that the process of developing digital competence in developed countries is carried out through forms such as mentoring systems, digital laboratories, and professional development on online platforms. This highlights the need to implement comprehensive approaches to enhance teachers' digital literacy in the education system of Uzbekistan.

Furthermore, during the discussion, it was determined that motivational factors play a crucial role in developing teachers' digital competence. Actively engaging teachers in the digital education process, evaluating their achievements, and establishing a system of material and moral incentives are considered important factors in increasing the effectiveness of digital pedagogy.

Based on the above ideas, it can be emphasized that the formation of digital competence is not only a technological process but also a complex pedagogical system that requires an approach from cultural, psychological, and methodological perspectives.



CONCLUSION

The research results showed that the transformation of digital pedagogy has become an integral component of the modern education system and requires teachers to develop new types of professional competencies, particularly digital competence. Digital competence includes not only technological knowledge and skills but also the ability to effectively organize teaching, learning, and assessment processes in the digital environment.

As identified in the study, the success of developing teachers' digital competence relies on several factors:

1. Level of pedagogical preparation - teachers' ability to apply modern digital methods and technologies in practice;
2. Technical and infrastructural capabilities - the level of digital tool provision in educational institutions;
3. Motivational and social factors - the teacher's need for professional development and adaptability to the digital environment.

The results of the study also demonstrated the necessity to establish a continuous education system, develop digital methodological guides, and implement professional development programs to enhance digital competence. Improving teachers' digital competence is emerging as a crucial condition for enhancing the quality of education, increasing students' digital literacy, and fostering innovative thinking.

Based on the above scientific analysis, the following conclusions can be drawn:

- The transformation of digital pedagogy necessitates restructuring teachers' professional activities in a new context;
- The development of digital competence should be carried out based on an integrative, systematic, and step-by-step approach;
- A teacher's digital competence should be recognized as one of the quality indicators of the educational process;
- Developing a national model for teacher training in the digital environment and harmonizing it with international standards is an urgent scientific and practical task.

Thus, the development of teachers' digital competence should be viewed not only as a technological direction of modern education but also as a strategy for the innovative development of the national education system.

LIST OF REFERENCES USED:

1. Alimova, D. (2023). Integration of digital educational technologies into the teaching process: problems and solutions. Tashkent: Science and Technology Publishing House.
2. Andreev, A. A. (2020). Digital pedagogy: Theory and practice of using digital technologies in education. Moscow: Akademkniga.
3. Ergasheva, M. (2022). Modern approaches to developing teachers' digital competence. "Pedagogy and Psychology" journal, No. 3, 45-52.
4. European Commission. (2022). DigComp 2.2: The Digital Competence Framework for Citizens. Luxembourg: Publications Office of the European Union.

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5. Hasanov, O. (2021). Innovative educational technologies and digital competence: theoretical foundations. Journal of Pedagogical Research of Uzbekistan, No. 2, 67-74.
6. Kozlov, V. I. (2021). Digital Transformation of Education: Problems and Prospects. Moscow: Prosveshchenie.
7. Murodova, Z. (2023). Directions for developing digital literacy of educators. Fergana State University Scientific Bulletin, No. 1, 82-89.
8. OECD. (2021). The Digital Education Outlook: Pushing the Frontiers with Artificial Intelligence, Blockchain, and Robots. Paris: OECD Publishing.
9. Qodirov, S. (2022). Digital pedagogy and innovative methods: The new role of the teacher. Journal of Educational Reforms, No. 4, 28-35.
10. Ruzmetova, N. (2023). Methodological foundations of digital transformation processes in education. Scientific Collection of Samarkand State University, No. 2, 54-61.
11. Selwyn, N. (2019). Should Robots Replace Teachers? AI and the Future of Education. Cambridge: Polity Press.
12. UNESCO. (2021). ICT Competency Framework for Teachers (Version 3). Paris: UNESCO Publishing.
13. Yusupov, B. (2020). Issues of Developing Teachers' Information Culture in Digital Education. Tashkent: Innovation Publishing House.

