

IMPROVING THE METHODOLOGY FOR DEVELOPING STUDENTS' DIGITAL PEDAGOGICAL-CREATIVE COMPETENCE IN PROBLEM-BASED TEACHING OF PEDAGOGICAL SCIENCES

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Abstract

This article discusses the development of digital pedagogical and creative competencies in future primary school teachers within the digital learning environment, particularly during the process of mastering pedagogical subjects such as mathematics and its teaching methodology. It analyzes the concept of digital-creative competence, its importance in the professional activity of teachers, and the role of modern information and communication technologies (ICT) in its development. Additionally, the article outlines ways to enhance students' independent learning, creativity, and methodological thinking skills by integrating digital resources into the learning process.

Keywords: Digital-creative competence, digital pedagogy, mathematics teaching methodology, future teacher, ICT, digital learning environment, independent learning, interactive methods.

Introduction

In accordance with the Resolution of the President of the Republic of Uzbekistan No. PQ-3245 dated August 29, 2017, "On measures to further improve the project management system in the field of information and communication technologies," and the Presidential Decree No. PF-4947 dated February 7, 2017, "On the Strategy of Actions for the Further Development of the Republic of Uzbekistan," the active involvement of educational institutions in the various reforms being implemented across different sectors of the country is being ensured.

In the 21st century, the education system has entered a phase of digital transformation. This process requires educators to possess not only professional competence but also digital competence. In particular, the use of digital technologies in mastering subjects such as mathematics and its teaching methodology by students studying in the field of primary education raises the quality of their future professional activities to a new level.



Today, in an era of rapid development of information and communication technologies, the effective organization of a digital environment in the education system and its rational use require future primary school teachers to possess new types of professional qualities. One of these is digital pedagogical competence. This competence holds a central place in the professional training of modern educators and reflects their ability to organize, manage, and analyze the educational process through the use of digital technologies.

In his scientific works, J.E. Usarov defines competence as "the manifestation of experience and knowledge in a particular field or area, the readiness to carry out activities, and the ability of an individual to act successfully in various non-standard situations."

Digital competence is manifested in the practical application of the process of developing knowledge, skills, and abilities in connection with the growing ability of future primary school teachers to use information technology tools.

In her research, L.M. Mitina explains that pedagogical competence encompasses subject knowledge, teaching methodology and didactics, pedagogical communication skills and abilities, as well as the integration of methods and tools for self-development and self-improvement. [5]

In J. Agaard's research, the term "**digital pedagogy**" emerged in the pedagogical education of various countries. The meaning of this term can be translated as the creation of opportunities to learn about and use modern digital technologies in education and teaching. The significance of digital pedagogy lies in its distinctive features that clearly differentiate it from online learning, as it is applied not only in online systems but also in hybrid and smart systems. [4]

Digital pedagogical competence is the readiness of future primary school teachers to purposefully, effectively, safely, and innovatively apply digital technologies in the educational process, as well as their ability to develop digital literacy. It encompasses not only technical skills but also didactic, communicative, ethical, and creative approaches. Forming digital pedagogical competence in future primary school teachers prepares them to effectively organize the educational process using digital technologies in the future.

Features of Developing Digital Pedagogical Competence in Teaching the Subject "Mathematics and Its Teaching Methodology":

1. **Effective explanation of topics using digital tools:** Since mathematics includes many abstract concepts, interactive digital presentations, graphics, animations, and simulations can help explain topics more clearly and engagingly.
2. **Encouraging independent learning:** Digital platforms (such as online tests, video tutorials, and virtual labs) provide students with opportunities to reinforce their knowledge independently.
3. **Enhancing methodological thinking and creativity:** Through digital educational resources, students can experiment with various teaching approaches, solve problem situations, and develop skills to create new teaching materials.
4. **Interactive methods and collaboration:** Online platforms enable group work, discussions, and collaborative projects, fostering communication and pedagogical skills among students.



5. Analyzing and managing the teaching process: Digital technologies allow monitoring students' activities, learning progress, and difficulties, enabling adjustment of teaching methodology accordingly.

6. Integrating technical and pedagogical skills: Developing the ability to effectively use modern digital devices and software in teaching mathematics and its methodology while considering students' didactic needs.

Digital pedagogical competence is an integral part of a teacher's professional activity in the digital society, serving to ensure the innovative content of the educational process. A mathematics teacher in the modern digital society must not only be a knowledge bearer but also a creator of an innovative learning environment. Therefore, one of the main goals in training future primary school teachers is to develop their digital pedagogical competence.

This article scientifically and theoretically analyzes the concept of digital pedagogical competence, its role in mathematics education, factors influencing its formation, and its methodological foundations.

Research shows that students studying subjects taught through digital technologies not only develop an interest in the subject but also deepen their knowledge independently, analyze problem situations, and learn to work collaboratively [3].

Thus, developing future teachers' digital competence enhances the effectiveness of mastering mathematics and its teaching methodology.

Digital pedagogical competence is the teacher's ability to effectively use digital technologies for didactic purposes, that is, the capacity to organize teaching, assessment, communication, and reflection processes using digital tools.

The results show that the application of digital technologies in the mathematics education process:

- Increases students' level of mastery;
- Develops students' creative thinking and logical reasoning;
- Teaches students to design and analyze lessons in a digital environment;
- Strengthens skills in independent work and reflection.

The following problems were also observed in developing digital competence:

1. Some students lack deep knowledge of digital tools;
2. Insufficient or unstable Internet resources;
3. Teachers themselves are unable to sufficiently apply digital methodologies.

Therefore, it is necessary to strengthen systematic work on forming digital culture in pedagogical education:

- Digital pedagogical competence plays a key role in the professional preparation of future primary school teachers;
- The use of digital tools in the subject of Mathematics and its teaching methodology develops students' logical, analytical, and creative thinking;
- A motivational–practical–reflective model in the learning process yields effective results for developing digital competence;



- The integration of digital technologies in the education system ensures that future teachers are formed as professionals who meet modern requirements.

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- The integration of digital technologies in the education system ensures that future teachers are formed as professionals who meet modern requirements.

Digital pedagogical competence is a complex system that integrates the professional, technological, and methodological preparation of future primary school teachers. It serves to develop their independent thinking, creativity, and digital literacy [6]. Especially in teaching the subject “Mathematics and its teaching methodology,” the development of this competence allows future educators to visualize learning materials and explain complex mathematical concepts in a simple and engaging way through digital tools.

Thus, in the modern digital society, the education system demands from teachers not only effective organization of the learning process but also the ability to manage it within a digital environment, implement new methods, and creatively use innovative technologies. From this perspective, developing digital pedagogical competence in future primary school teachers is an essential condition for improving the quality of education.

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