



## DEVELOPMENT OF DIGITAL MEDIA AND INFORMATION COMPETENCE IN PRE-SERVICE TEACHERS

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### Abstract

This article analyzes the theoretical foundations, methodological approaches, and practical significance of developing digital media and information competence in pre-service teachers. The system of competencies required for effective functioning in a digital environment is revealed. The research findings indicate that the formation of digital competence in the process of training modern teachers requires a continuous and systematic approach.

**Keywords:** Digital competence, media literacy, information technologies, pedagogical competence, educational process, innovative methods.

### Introduction

In the context of globalization and digitalization, the education system is undergoing significant transformation. The rapid development of information and communication technologies (ICT) requires teachers not only to possess traditional knowledge but also to have the skills necessary to operate effectively in a digital environment.

The development of digital media and information competence in pre-service teachers is considered one of the key directions of modern pedagogy. This is because a teacher is not only a transmitter of knowledge but also a facilitator who teaches how to select, analyze, and effectively use information.

The aim of this study is to identify and substantiate effective ways of developing digital media and information competence in pre-service teachers.

Literature Review. In recent years, due to the rapid development of digital technologies, the concept of "digital competence" has become one of the central categories in scientific and pedagogical research. This concept encompasses not only technical skills but also a complex set of competencies, including searching for information, analyzing it, using it effectively, and operating safely in a digital environment.





At the international level, one of the most significant frameworks that systematically defines digital competence is the Digital Competence Framework for Citizens (DigComp), developed by the European Commission [1]. According to this model, digital competence consists of five main areas, which include:

information searching, filtering, and critical analysis;

digital communication and collaboration;

digital content creation;

safety (protection of personal data and cybersecurity);

problem-solving and creative use of technologies.

These areas contribute to the formation of universal competencies necessary for the professional activity of a modern teacher.

The issue of media and information literacy has also been extensively studied by various international organizations. In particular, within the Media and Information Literacy (MIL) framework developed by UNESCO, media literacy is defined as a set of abilities that enable individuals to access, analyze, evaluate, and create information [2]. This approach places special emphasis on the development of critical thinking skills, which are essential for identifying false or manipulative information.

In scientific literature, there are different interpretations of the concept of digital competence. Some researchers define it as the ability to use information and communication technologies, while others interpret it more broadly as an individual's capacity to function effectively in a digital society [3]. From this perspective, digital competence is a multi-component system that reflects the integration of knowledge, skills, and attitudes.

In the pedagogical context, digital competence holds particular importance. A modern teacher should not only possess subject knowledge but also be able to apply innovative technologies in the educational process, effectively use digital resources, and foster students' media literacy [4]. Therefore, the development of digital competence is considered one of the priority tasks in teacher education.

At the national level, significant attention is also being paid to this issue. In Uzbekistan, within the framework of the "Digital Uzbekistan – 2030" strategy, the digitalization of the education system, improvement of teachers' ICT skills, and the widespread implementation of digital educational resources have been identified as priority areas [5]. This further emphasizes the necessity of developing digital media and information competence in pre-service teachers.

Based on the analysis of the above-mentioned theoretical approaches, it can be concluded that digital competence is the ability of an individual to function



effectively, safely, and critically in a digital environment. From a pedagogical perspective, it represents a teacher's professional competence aimed at organizing, managing, and improving the educational process through the use of technologies.

## Methods

In this study, a set of scientific and pedagogical methods was employed based on a comprehensive approach in order to examine the process of developing digital media and information competence in pre-service teachers and to identify effective methods for its enhancement. The research methodology was grounded in the integration of theoretical and practical stages.

At the theoretical stage of the study, the method of analyzing scientific literature played a leading role. During this stage, both national and international academic sources related to digital competence, media literacy, and information culture were examined. Existing conceptual approaches were analyzed and synthesized, which allowed for the establishment of the theoretical foundations of the research and clarification of the core concepts.

The comparative method was used to analyze various scientific perspectives, as well as the distinctive features and differences among existing models. In particular, international experiences and national approaches to the development of digital competence were comparatively studied, and their most effective aspects were identified. This made it possible to substantiate the methodological solutions applied in the research.

At the empirical stage, observation and generalization methods were widely utilized. The learning activities of pre-service teachers, their level of engagement with digital technologies, and their skills in perceiving and analyzing media products were systematically observed. The collected data were analyzed, generalized, and used to draw relevant conclusions.

In addition, elements of pedagogical experimentation were incorporated into the study. During the experimental process, specific methodological approaches aimed at developing pre-service teachers' digital competence were tested. In particular, the educational process was organized through the use of interactive methods, project-based learning, digital learning platforms, and multimedia tools. The effectiveness of these methods was evaluated based on the outcomes of the experiment.

Furthermore, a diagnostic approach was applied to assess the level of digital competence among pre-service teachers. This involved evaluating participants' skills in searching for and processing information, using digital tools, and demonstrating





media literacy. Based on the results, their levels of competence (low, medium, high) were determined, and directions for further development were identified.

This methodological approach ensured the reliability of the research, enabled an in-depth analysis of the obtained results, and facilitated the development of practical recommendations. As a result, a methodological framework aimed at effectively developing digital media and information competence in pre-service teachers was designed.

## Results

The results of the conducted study demonstrated that the development of digital media and information competence in pre-service teachers is a multi-component and systematic process. Based on the empirical data obtained during the research and their analysis, it was determined that this competence consists of several key components.

First, information competence emerged as a fundamental condition for pre-service teachers' independent functioning in a digital environment. Within this component, participants' skills in searching for information, filtering it, evaluating its reliability, and critically analyzing it were examined. The findings revealed that at the initial stage, most students demonstrated a superficial approach to information selection; however, as a result of targeted methodological interventions, their level of critical thinking significantly improved. In particular, the ability to compare information from different sources and analyze it was identified as one of the most important outcomes.

Second, media competence proved to be a crucial factor determining pre-service teachers' activity within the media space. During the research process, participants' abilities to analyze media products, verify the accuracy of information, and adhere to media ethics were assessed. The results indicated that by the end of the experiment, students' ability to identify false and manipulative information had significantly improved. In addition, the development of ethical awareness in the use of media materials was noted as a positive outcome.

Third, technological competence reflects pre-service teachers' level of proficiency in using information and communication technologies. The study analyzed students' skills in using various digital tools, working with online platforms, and creating digital content. The findings showed that through practical training and regular use of digital tools, their technological literacy significantly increased. In particular, skills such as preparing presentations, developing electronic educational resources, and utilizing distance learning platforms were effectively formed.





Fourth, communicative competence is associated with organizing effective interaction in a digital environment and occupied an important place in the study. Participants' abilities to communicate online, actively engage in distance learning processes, and collaborate within teams were observed. The results demonstrated that during activities on digital platforms, students' communicative engagement increased, and their collaborative skills improved.

The study also made it possible to determine the effectiveness of the methods used to develop digital competence in pre-service teachers. In particular, interactive methods (such as clustering and brainstorming) played a significant role in enhancing students' independent thinking. The project-based learning approach contributed to the development of their practical skills.

Furthermore, the use of distance learning platforms accelerated students' adaptation to the digital environment, while multimedia tools enabled the delivery of educational content in a more accessible and engaging manner. The integrated application of these methods resulted in a noticeable increase in the level of digital media and information competence among pre-service teachers.

Overall, the research findings confirmed that the development of digital competence in pre-service teachers requires a systematic approach, the integration of modern pedagogical technologies, and the active involvement of practical activities.

## **Discussion**

The results of the study indicate that the process of developing digital media and information competence in pre-service teachers is not sufficiently effective within the framework of traditional teaching methods. Conventional approaches are primarily focused on the transmission of theoretical knowledge and do not fully enable the development of practical skills required for functioning in a digital environment. Therefore, the integration of innovative pedagogical technologies into the modern educational process emerges as a pressing necessity.

The problems identified during the research reveal certain shortcomings in the professional training of pre-service teachers. In particular, their level of proficiency in using digital technologies was found to be insufficient. This situation is often explained by the superficial use of technological tools and a lack of deep understanding of their didactic potential. As a result, digital tools are used merely as auxiliary instruments rather than as means of enriching the educational process.

In addition, a low level of media literacy was identified as a significant issue. Pre-service teachers often experience difficulties in assessing the reliability of information sources, which increases the risk of using inaccurate or manipulative





information. This issue becomes especially critical in the context of the rapidly growing flow of digital information and represents a serious pedagogical challenge. Furthermore, the insufficient development of critical thinking skills was identified as another important concern. A lack of critical thinking limits students' ability to analyze information in depth, compare different perspectives, and draw well-founded conclusions. This, in turn, may negatively affect their future professional performance as educators.

In order to address these challenges, several methodological recommendations were developed based on the research findings. First, it is necessary to increase the proportion of practical training within the educational process. Through practical activities, pre-service teachers can develop essential skills in using digital tools effectively, as well as in creating and analyzing media content.

At the same time, the broader implementation of digital learning platforms is of great importance. Distance learning systems, online resources, and interactive platforms enhance students' independent learning and facilitate their adaptation to the digital environment. This contributes to the improvement of their professional competence. It is also recommended to organize specialized courses and training programs aimed at developing media literacy. Within such courses, students should be provided with systematic knowledge on critical analysis of information, identification of false information, and adherence to media ethics.

Overall, the findings confirm that the development of digital media and information competence in pre-service teachers requires a comprehensive approach. In this process, the application of innovative technologies, the enhancement of practical activities, and the creation of specific pedagogical conditions aimed at developing media literacy play a crucial role.

## **Conclusion**

In conclusion, the development of digital media and information competence in pre-service teachers is one of the priority directions of the modern education system. The acceleration of digitalization processes, the rapid growth of information flow, and the transformation of the educational environment impose new requirements on the professional training of teachers. From this perspective, the formation of teachers' digital competence emerges as a key factor ensuring their effective future pedagogical activity.

Based on the research findings, it can be emphasized that the development of digital media and information competence requires an integrated and systematic approach. This process should not be limited to theoretical knowledge alone but must be





implemented through the combination of innovative pedagogical methods, modern information and communication technologies, and practical activities. In particular, the development of pre-service teachers' independent learning skills, effective use of digital resources, and enhancement of media literacy are of significant importance. Furthermore, in the process of developing digital competence, it is necessary to create appropriate pedagogical conditions within educational institutions, improve curricula in accordance with modern requirements, and increase the proportion of practical training. This will contribute not only to the development of technological knowledge but also to the enhancement of critical thinking, information analysis, and conscious use of information among pre-service teachers.

In the future, special attention should be paid to digital media and information competence within teacher education systems, recognizing it as an integral component of professional competence. At the same time, expanding research in this field, studying advanced international practices, and adapting them to the national education system remain pressing tasks.

Overall, the development of digital competence in pre-service teachers is an important factor in improving the quality of education, advancing innovative pedagogical practices, and preparing highly qualified professionals who meet the demands of modern society.

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