EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

TECHNOLOGICAL AND METHODOLOGICAL FOUNDATIONS FOR DEVELOPING DIGITAL COMPETENCIES IN PRE-SERVICE TEACHERS

Gulomjon Gafurovich Kurbonov
Associate Professor, Head of the "Mathematics and Informatics" Department,
Bukhara State Pedagogical Institute, PhD in Pedagogical Sciences
ORCID: 0000-0002-9508-5056
Email: gulomjonqurbonov0880@gmail.com

Abstract
This article identifies the technological and methodological aspects of developing digital-creative competencies among pre-service teachers in the context of distance education in the Republic of Uzbekistan. It also clarifies the essence of key concepts such as "competence," "digital competence," "digital-technological competence," "digital-methodological competence," "creativity," and "digital pedagogical campus". During the research process, an online questionnaire and an online test were conducted. A mobile application was developed for the implementation of the online test. Only Uzbek pre-service teachers participated in the experimental study, and their digital competencies were compared with those of Russian pre-service teachers. The article defines the content of digital-technological and digital-methodological competencies of pre-service teachers in distance learning conditions. In addition, it presents the structure and development framework of interrelated competencies of future teachers in the context of distance education.

Keywords: Digital-technological competence, digital-methodological competence, information tools, digital environment, reflective ability, digital competence, digital education, digital literacy, communicative competence, technical competence.

Introduction

In the context of the rapidly developing Republic of Uzbekistan, improving the teacher training system in pedagogical institutions and developing digital competencies among pre-service teachers has become an increasingly urgent issue. In the 21st century, the accelerating process of informatization in society has significantly expanded the scope of the global information environment to an unprecedented level. This process has also

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

encompassed the education system, thereby requiring new content and approaches in the professional preparation of future teachers.

Innovative pedagogical practices are currently implemented through the use of the Internet, online resources, information tools, and digital environments. In this context, information becomes equally and simultaneously accessible to every individual, including teachers, regardless of physical presence in the workplace [1]. Within the framework of a "Digital Uzbekistan," pedagogical institutions must possess innovative information and pedagogical resource banks, digital media libraries, and knowledge bases related to modern communication technologies in order to prepare globally competitive future teachers.

Furthermore, such institutions are expected to conduct innovative research aimed at developing students' creative and intellectual potential, diagnose its outcomes, and implement systematic pedagogical monitoring. This system also envisions the training of future teachers who are capable of designing technological maps of innovative lessons and effectively engaging in high-level intellectual and innovative professional activities.

Literature Review

The Essence of the Concept of Competence

In psychological and pedagogical literature, the term "competence" is interpreted in a broad sense. Within pedagogical science, professional competence is viewed as an integrated combination of knowledge and skills, the scope of abilities for solving professional problems, the interrelation of personal qualities and capabilities, a set of professionally significant traits, as well as a complete system of theoretical and practical preparation required for professional activity.

Competence can be defined as the ability of a teacher to independently acquire knowledge, professional skills, and culture, and to adapt them as a specialist in accordance with modern requirements.

In a concise foreign language dictionary [2], the term "competence" (from Latin competens – appropriate, capable) is defined as being an expert in a specific field, possessing sufficient knowledge, and having the right or authority to perform or decide something based on one's knowledge.

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

In the Russian encyclopedic dictionary [3], "competence" (Latin competens – appropriate, striving, suitable) is explained as being capable in one's work, possessing sufficient knowledge and experience, and demonstrating mastery.

According to studies by Uzbek scholars, the concept of "competence" is complex and multifaceted, encompassing professional, socio-pedagogical, socio-psychological, legal, and other dimensions [4,5]. In general terms, a specialist's competence reflects the interconnection of abilities, qualities, and personal characteristics, which determines the effective performance of professional activities in any field.

Components of Competence

The components of competence include the following: Organizational skills – the specialist's ability to establish effective and rational communication within the process of collaboration; Empathic ability – the capacity to understand others, show empathy, and put oneself in another person's position; Reflective ability – the ability to promptly regulate one's own behavior and the behavior of a partner, make effective decisions in conflict situations, create a favorable psychological environment, and anticipate the development of interpersonal relationships [6]. The structural components of competence are presented in Figure 1.

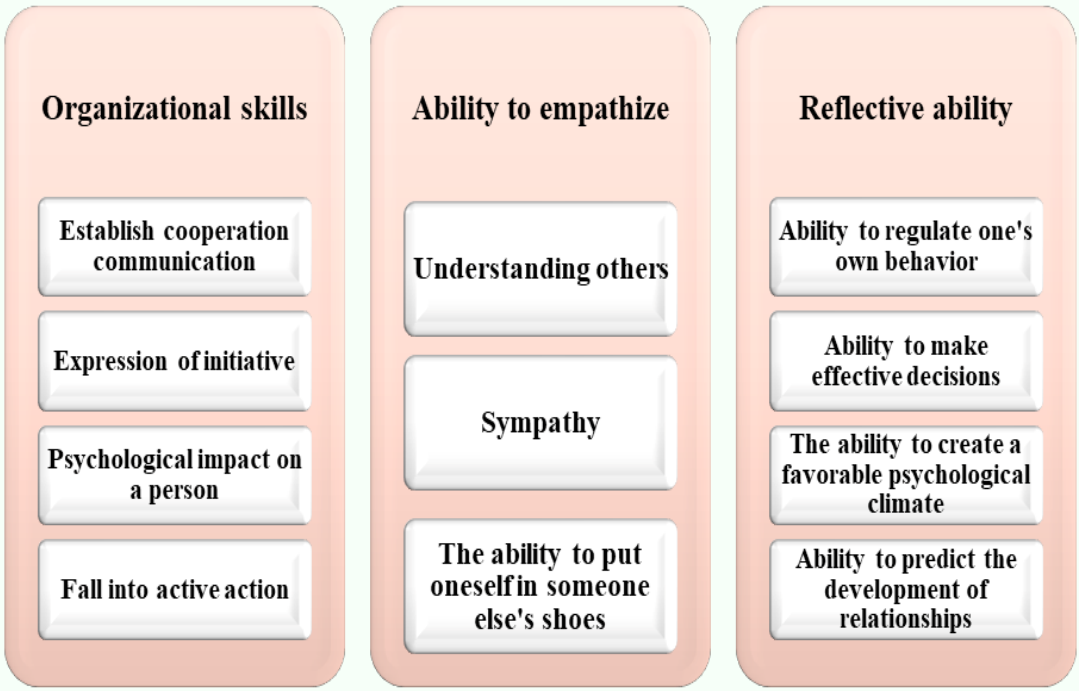

Figure 1. Structural components of competence

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

The Essence of the Concept of Digital Competence. At the current stage, the widespread application of modern technologies in the educational process has significantly expanded the learning opportunities of educational institutions and led to the emergence of new forms of education [7]. The "digital generation" has entered modern life. Today, representatives of a new generation who cannot imagine life without the internet are studying in general education schools, secondary specialized institutions, and higher education establishments.

In the new era, representatives of different generations live, study, and work in Uzbekistan. The labor market and employers are increasingly comparing not only the professional competencies of future specialists but also their level of digital competence. According to researchers, digital technologies are becoming not only tools but also an integral part of the human living environment [8].

The Digital Learning Environment and the Concept of Digital Competence. The digital learning environment creates the following new opportunities:

- Transition from classroom-based teaching to learning anytime and anywhere;
- Designing individualized independent learning pathways (routes);
- Transforming students from consumers of ready-made resources into creators of new digital resources.

According to research conducted by the European Union on assessing the level of teachers' digital competence, only 20-25% of teachers acquire the necessary digital competencies that enable them to effectively use digital technologies in the educational process [9].

In 2006, the European Union defined "digital literacy" and "digital competence" as one of the eight key competencies of lifelong learning. According to the EU definition, digital competence refers to the ability of individuals to confidently and critically use information and communication technologies for work, leisure, and communication.

The concept of digital competence also includes basic skills such as using computers in professional activities, storing and managing information, sharing data, and accessing network communication via the Internet [9].

Expansion of the Concept of Digital Competence in the Third Millennium. In the third millennium, with the rapid development of information, digital, and telecommunication technologies, the concept of digital competence has been continuously expanding year by year. According to the research conducted by Soldatova and colleagues [10], digital competence is a complex phenomenon that integrates four interrelated competencies:

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

Components of Digital Competence.Information and media literacy. This component includes the knowledge, skills, motivation, and responsibility related to searching, understanding, organizing, archiving, and constructively representing digital information. It also involves the ability to shape the information environment using digital resources such as text, video, audio, and other media formats.

Communicative competence. This refers to the knowledge, skills, motivation, and responsibility required for effective communication in various contexts, including email, chats, blogs, forums, social networks, and other forms of digital interaction.

Technical competence. This involves the knowledge, skills, motivation, and responsibility necessary for the safe and effective use of technologies and software tools, including computer networks and cloud services, to perform various tasks.

Consumer competence. This refers to the knowledge, skills, motivation, and responsibility needed to solve real-life situations by using digital devices and the Internet to meet various everyday needs and perform routine tasks [10].

Definition of Digital Competence. According to researchers, digital competence is defined as an individual's ability to safely select, reliably, constructively, and effectively use information and communication technologies across various areas of life activity, including working with digital content, communication, consumption, and the technosphere.

Transformation of Public Awareness and Emerging Educational Models.The development of public consciousness is leading to the implementation of new models and approaches within the education system: Digital technologies that are effective in the dissemination of knowledge; Technological startups in the field of education; Increased competition for talents and the rapid development of the entire sector; Innovation and activity in education; Openness in global education, including massive open online courses (MOOCs), open universities, "digital universities," and similar initiatives.

Competence is defined as the ability of a teacher to independently improve their knowledge, professional skills, and cultural level, as well as to adapt them to contemporary requirements. In this sense, competence can be considered a pathway toward creativity.

In a concise psychological dictionary, the concept of "creativity" is interpreted as follows: the term Creativity originates from Latin and literally means "creation," "hidden force," or "the ability to create." Creativity is regarded as a personal quality

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

that manifests itself in an individual's readiness for productive activity and innovation, as well as in the presence of stable motivation to achieve high-level results [11].

Researcher Ospanova [12], while exploring the scientific foundations of developing creativity in future specialists, defines creativity as follows:

"Creativity is the ability to be inventive; the level of creative abilities that characterize a person; unconventional thinking; the ability to generate new ideas; creativity and talent; the ability to make quick and intelligent decisions; a high level of intellectual activity; the ability to perceive and understand novelty; and the ability to solve non-standard situations" [12].

In the context of distance learning, the development of creative competencies among future teachers is of great importance. Ospanova [14] identifies the structural components of creativity in future specialists as follows:

Goal orientation: the ability to plan the pedagogical process, think and act unconventionally, define goals and tasks clearly, verify assumptions, and apply constructive thinking.

Technological component: communicativeness; the ability to apply theoretical knowledge in practice; the pursuit of new knowledge; activity and initiative; openness to change; and adaptability to unconventional types of activities.

Reflective component: situation analysis; self-awareness; self-assessment; self-development; the ability to evaluate oneself; and the capacity to put oneself in others' positions, among other skills [12].

The Essence of the Concept of Technological Competence. The term "technology" originates from Greek and consists of two words: "techne" meaning art, skill, or craft, and "logos" meaning science or doctrine. Thus, it can be interpreted as the "science of skill" or "the doctrine of mastery" [13].

Initially, the concept of "technology" was introduced in the industrial production sphere, and the term "technological process" was later incorporated into scientific literature. A technological process refers to a systematically organized production activity carried out in a specific sequence based on established scientific laws, characterized by controllability and predictability [14].

An analysis of scientific and pedagogical literature shows that there is no unified approach to the concept of "pedagogical technology" in modern pedagogical theory. Some scholars interpret it as the technologization of educational institutions, while others associate it with computerization and the provision of audiovisual tools. Another

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

perspective defines pedagogical technology as the level of practical implementation of didactic projects and pedagogical systems.

Research Aim and Hypothesis

The aim of this study is to identify the technological and methodological aspects of developing digital-creative competencies among pre-service teachers in the context of distance education in the Republic of Uzbekistan. This process is carried out within the framework of integration between Uzbek and European education systems, based on cooperation and partnership between higher education institutions in Uzbekistan and foreign universities. The ultimate goal is to improve the pedagogical education system in Uzbekistan under new educational conditions.

Future teachers studying in pedagogical fields must not only acquire deep knowledge of the subjects they will teach but also master internet resources and digital learning platforms that enable effective work in digital educational environments. This, in turn, ensures the comprehensive development of their professional competence and digital skills.

Research Objectives:

➢ o identify the technological and methodological directions for developing digital-creative competencies of pre-service teachers in distance education under new conditions in Uzbekistan.

➢ To develop a cooperation model, a comprehensive methodology, and implementation mechanisms for forming digital and creative competencies of pre-service teachers within the framework of educational integration between higher education institutions of the Republic of Uzbekistan and foreign universities in distance learning conditions.

➢ To determine effective methods for identifying the technological and methodological directions of developing digital-creative competencies of pre-service teachers in the distance learning process in Uzbekistan under new conditions.

Methodology

International experience demonstrates that distance education provides full opportunities for acquiring innovative knowledge and developing professional skills. Distance learning is defined as a form of education carried out through the indirect

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

(remote) or partially indirect interaction between students and teachers using information and communication technologies as well as telecommunication tools within an educational process.

At the stage of new development opportunities in the context of the Fourth Industrial Revolution, future teachers are required to meet several new demands, including competitiveness, high quality of education, professionalism, effectiveness, digital competence, and creativity necessary for distance learning and teaching.

According to the State Program for the Development of Education and Science of the Republic of Uzbekistan (2020–2025), students in higher and master's education are expected to demonstrate five learning outcomes: (1) possessing knowledge and understanding of their field of study; (2) applying knowledge at a professional level, forming arguments, and solving problems; (3) collecting and interpreting data; (4) communicating information, ideas, and solutions; and (5) developing skills for independent lifelong learning (State Program for the Development of Education and Science of the Republic of Uzbekistan, 2026–2030).

To ensure the achievement of the above-mentioned five learning outcomes, the following professional competencies should be developed in pre-service teachers:

✓ Creative skills: motivation toward innovation and the ability to master innovative technologies;

✓ Research skills: abilities related to learning, conducting research, and accumulating innovative experience;

✓ Pedagogical reflection skills: the ability to analyze professional activity and apply constructive thinking in pedagogical practice.

Data Collection Instruments and Procedures. During the research, an online questionnaire and an online test were conducted. In order to determine the level of digital competencies required for the effective use of digital technologies among pre-service teachers in Uzbekistan under new conditions, an online survey titled "I will become a SMART teacher!" and an online test were administered over a three-year period among first- to fourth-year students. For this purpose, a specialized mobile application was developed for the online testing process. Only pre-service teachers from Uzbekistan participated in the experimental study, and their digital competencies were compared with those of pre-service teachers in Russia. In addition, diagnostic monitoring was carried out.

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

Data Collection and Analysis. Within the framework of the project, indicators and criteria for assessing the level of digital competence of pre-service teachers in Uzbekistan were identified and their content was clarified. An online training program titled "I will become a SMART teacher!" was conducted for pre-service teachers from M. Kh. Dulati Taraz Regional University (Kazakhstan) and Shadrinsk State Pedagogical University (Russia), and a comparative analysis of their digital competence levels was carried out. Deductive and inductive methods were used in the study.

The level of digital competence of both Uzbek and Russian pre-service teachers participating in the online course was assessed before and after the training. An online survey titled "What I know about distance learning technologies" and "What I have learned about distance learning technologies" was conducted. The collected data were processed and analyzed using mathematical and statistical methods, methodological recommendations were developed, and conclusions were drawn.

Analytical Method

Most importantly, a SWOT analysis was conducted on the development of digital competencies among pre-service teachers in distance education under new conditions in Uzbekistan. The essence and content of technological and methodological aspects of forming digital competencies in pre-service teachers within distance learning conditions in the Republic of Uzbekistan were revealed, and a SWOT analysis matrix was developed.

The strengths and weaknesses of developing digital competencies among pre-service teachers in distance education were identified, and the influencing pedagogical factors were distinguished.

In addition, the risks occurring in the process of forming digital competencies among pre-service teachers in distance education were identified, and measures for their mitigation were determined. Existing opportunities were analyzed, and relevant pedagogical conditions were established.

Results and Discussion

Today, in everyday educational and professional activities, terms such as "Generation Z," "digital generation," and "network generation" are widely used to describe the socially adapted younger generation in the context of digital technologies.

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

Representatives of the digital generation differ in terms of perception, memory, thinking, motivation, behavioral patterns, life attitudes, and worldview. They are individuals who acquire socially and professionally significant competencies required in a digital society. Digital ("advanced," "smart," "SMART") technologies constitute the core of the modern stage of technological development and are expected to maintain their leading role in the near future.

SMART-oriented education is based on individual characteristics, motivation, abilities, access to open resources, and the use of technologies. SMART education represents a learning process characterized by self-management, motivation, flexibility, technological integration, evidence-based approaches, resource-rich environments, and technology-driven teaching methods. The main goal and concept of SMART education strategy is to develop creative and globally competent human capital through a "classroom revolution" that transforms educational content, teaching methods, assessment approaches, and the learning environment within a new educational paradigm.

The use of digital and information technologies, as well as electronic textbooks in higher education institutions, enables pre-service teachers to independently enhance their knowledge. It also contributes to the development of their creativity and ensures deeper and more comprehensive mastery of learning materials. In distance learning conditions, there is a clear need to modernize the content of higher education in order to develop both digital and creative competencies among future teachers.

Active Aspect. In distance learning conditions, the pedagogical conditions for developing digital competence among pre-service teachers include the following:

- The volume of information and the speed of its reception;
- The ability to meaningfully process information, including searching for and organizing relevant and necessary data;
- The quality of information acquisition, i.e., mastering the required educational material;
- The ability to make decisions based on information, including pedagogical reflection and constructive thinking, among others.

Digital and Technological Competence in Distance Education. In distance learning conditions, the digital and technological competence of pre-service teachers is determined through the development of skills in working with internet resources,

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

pedagogical websites, portals and digital learning platforms, modern digital educational content, electronic and multimedia textbooks, computer software, as well as multimedia devices.

In addition, the digital and methodological competence of pre-service teachers is defined through the following activities: creating information bank resources and electronic media libraries; organizing pedagogical coaching and training sessions; participating in pedagogical forums and discussions; presenting their own innovative projects; and freely defending their ideas (see Figure 2).

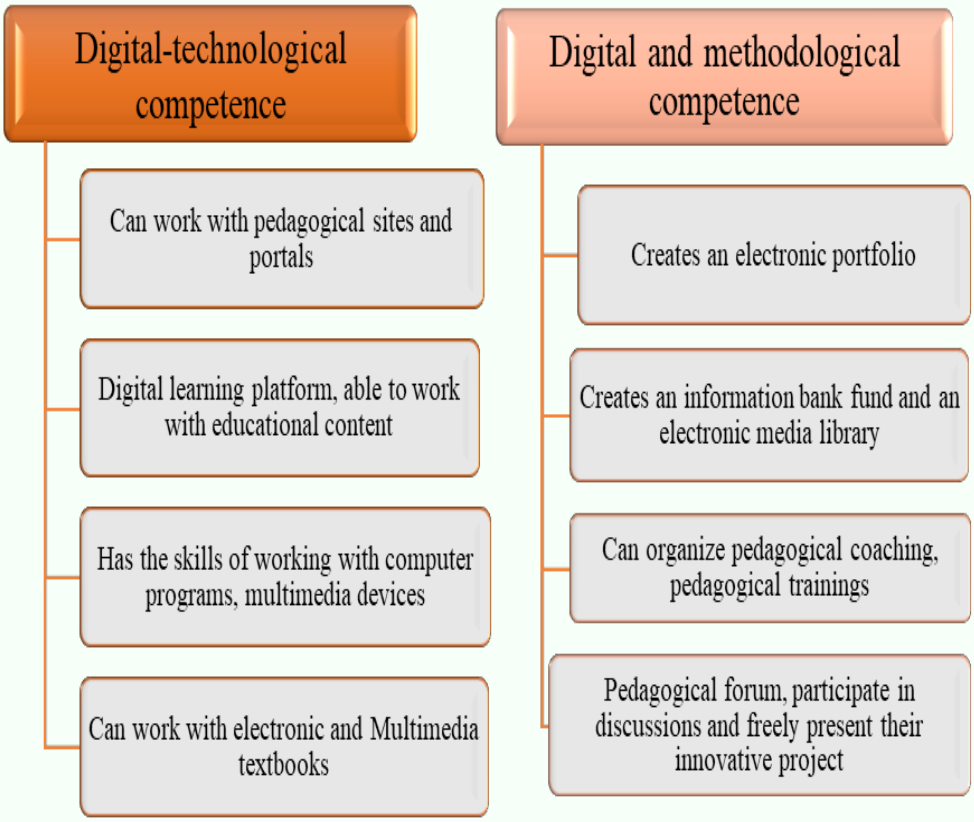

Figure 2. Digital-Technological and Digital-Methodological Competencies of Pre-Service Teachers in Distance Education

As noted by Tikhomirov [15], Smart refers to a society that requires a new paradigm of development, new opportunities of the Internet, and specially trained individuals capable of generating new knowledge. The concept of Smart education represents a flexible and continuously developing environment that fosters intellectual

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

cooperation in the interests of society and the state, ensuring students' acquisition of knowledge, skills, and competencies.

The main idea of Smart education is the recognition and integration of new sources of knowledge and technologies used alongside traditional lectures. Smart education is a creative learning environment that unites the efforts of specialists. The transition to active content in acquiring global knowledge requires the modernization of the education system and the preparation of intellectually capable, critically thinking, and problem-solving teachers, which is particularly relevant in the context of modern Uzbekistan. Smart education encompasses the complex interrelations of all educational processes, including the methods and technologies applied within them. Knowledge sources should be accessible not only to students and teachers working in groups or digital environments but also at any time and from any location within the global Internet space.

At the current stage, within the framework of developing professional competence and describing related phenomena and approaches, research interest in the concepts of "information competence," "digital competence," and "smart personality competence" is growing. A smart society represents a new quality of society characterized by a qualitative transformation in the interaction between technological tools, service systems, and qualified individuals using the Internet. This enables new experiences and provides social, economic, and other benefits, contributing to improved quality of life. In earlier studies, some scholars have considered the smart society from three perspectives: as a sociocultural paradigm shift; and as an intersubjective space formed through interactions between technological tools, services, and internet users.

The world of information reality is increasingly perceived as a space in which qualitative changes in interactions between subjects play a decisive role, enabling new life experiences associated with the implementation of Smart technologies. A Smart society emerges within the environment of Smart technologies and coexists alongside them. In pedagogical science, Smart competence is not yet a stable or fully explored phenomenon. At the current stage, approaches to studying and defining Smart competence as a phenomenon of modern society are being developed. Smart competence refers to an individual's ability to search for, analyze, and use smart technologies in innovation processes, as well as to effectively collaborate within professional online communities. Based on an analysis of existing research,

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

Buzaubakova [16] summarizes scholars' views on the phenomena of "information competence," "digital competence," and "smart competence."

Information technologies are defined as hardware and software tools based on computer technologies that ensure the storage and processing of educational information, its transmission to students, interactive communication between students and teachers or pedagogical software systems, as well as the assessment of students' knowledge [17]. The cultural and historical potential of approaches to the phenomena of teachers' information competence, digital competence, and smart competence is characterized by their evolution and transformation aimed at forming an intellectually developed personality and ensuring harmony in educational development. "Information competence," "digital competence," and "smart teacher competence" as phenomena of contemporary reality are reflected in the contexts of the information society, digital society, and Smart society.

Information Competence and the Use of Digital Technologies in Education. Information competence is defined as a competence associated with an individual's experience of interaction with technologies and technical tools aimed at fulfilling both general and professional information needs. In the process of education and teaching, digital technologies are used with the computer functioning as a working tool that performs multiple roles, including text preparation and editing, serving as a text processor, drawing and tabular tool, graphic editor, calculator, and compact auxiliary instrument.

The use of digital technologies in education is a method applied in the comprehension, evaluation, analysis, and synthesis of information obtained through observation, experimentation, reflection, and reasoning [18]. This process includes the collection of relevant information, critical analysis and evaluation of evidence, the development of reliable solutions and generalized conclusions, as well as the revision of predictions and recommendations based on accumulated experience.

Development of Technological Competencies in Pre-Service Teachers. Pre-service teachers can develop technological competencies by studying the experience of innovative scholars and creative educators. Within the digital pedagogical hub, future teachers engage in research and creative activities in cooperation with both local and international scholars. Their activities include:

✓ Conducting research on pedagogical websites and portals, and acquiring innovative knowledge from electronic textbooks;

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

✓ Creating information bank resources and electronic media libraries in their field of specialization and future subject area;
✓ Carrying out pedagogical diagnostics and monitoring within digital learning platforms used in distance education (such as Bilimland, Kyndelik.kz, Darin Online, and others), as well as performing SWOT analyses of educational content, computer software, and multimedia tools;
✓ Participating in coaching sessions, pedagogical trainings, forums, and discussions on current issues in distance education within the framework of pedagogical coworking, expressing their views, and acquiring necessary digital and creative competencies;
✓ Developing self-management skills by engaging in pedagogical reflection on each of their professional activities.

Target-Oriented Activity Aspects. In the context of new conditions, an international online competition titled “My First Online Lesson” was organized with the aim of studying, applying, researching, and promoting innovative practices in distance education for the preparation of internationally competitive pedagogical staff. This international competition brought together well-known scholars from our country, pre-service teachers, teaching methodologists from educational institutions, as well as researchers and pre-service teachers from Shadrinsk State Pedagogical University (Russia).

The main purpose of the competition was to develop the digital competencies of students in teacher education programs, stimulate the creative activity of pre-service teachers, enhance the quality of educational processes, and improve the scientific and methodological support of education. The online competition “My First Online Lesson” contributed to activating the creative and professional potential of pre-service teachers, implementing modern innovative educational technologies into teaching practice, improving their professional skills, and forming their social and professional identity.

The online lessons of pre-service teachers were evaluated based on five criteria:
➢ The alignment of instructional content with didactic requirements;
➢ The teacher’s subject knowledge, technological competence, and overall level of expertise;
➢ The effectiveness of speech culture and communication style with students;

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

- The general cultural level of the pre-service teacher;
- The quality of the video lesson, including logical structure of the content, relevance and informativeness of selected segments, quality of supplementary materials, effectiveness of ICT tools, as well as the technical quality of recording and editing the video lesson.

The pre-service teachers who participated in the competition effectively utilized a range of digital educational platforms, including Zoom, Microsoft Teams, Google Meet, Google Classroom, Padlet, Clideo, Quizizz, Wordwall, Crossword Labs, Canva, and Survio. This online competition guided pre-service teachers toward the rational use of new forms of digital educational content and supported their acquisition of advanced teaching technologies from a digital education perspective.

Conclusion

Digital technologies make it possible to enhance existing methods of monitoring and assessing pre-service teachers' knowledge levels, as well as to develop new and modern assessment approaches. At the same time, the analysis of large volumes of data on students and their activities in the digital environment enables university instructors to provide adequate support and create conditions for pre-service teachers to work independently in digital learning settings.

In distance education settings, there are significant opportunities for developing and assessing pre-service teachers' digital competencies, including:

- Learning to communicate digitally with students and colleagues;
- Developing skills for creating and sharing content in digital environments;
- Using and adapting existing digital content in the creation of educational materials;
- Deepening knowledge of information security methods;
- Evaluating the reliability of information and identifying false or biased content;
- Ensuring safe and responsible use of digital technologies;
- Applying digital technologies creatively to solve educational problems;
- Using digital tools to manage the learning process and monitor students' online activities;
- Learning to assess and track students' knowledge level and intellectual development using digital tools.

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

One of the main advantages of using digital technologies in education is the opportunity to actively engage all students in the learning process. In addition, digital technologies enable the adaptation of the educational process to each student's level of knowledge, interests, and individual needs. At the same time, to prevent the reinforcement of existing inequalities – such as unequal access to the internet, personal computers, or differing levels of digital literacy – it is essential to ensure equal access to digital technologies for all students.

References

1. M.Halapa & M.Djuranovic. Children and digital media. Global Journal of Sociology: Current Issues, vol. 11, no. 2, pp. 71–78. (2021).
2. Short dictionary of foreign words. P. 254, (1990).
3. Encyclopedic dictionary of the Russian language. M.: Russian language, p. 794, (1990).
4. A.Amirova, K.Buzaubakova, Z.Kashkynbayeva, M.Yelubayeva, Z.Kumisbekova, U.Elmira, & Z.Genc. Training the creative competence of future teachers. (2018). https://digibug.ugr.es/handle/10481/59960.
5. A.Z.Zhumash, A.Zhumabaeva, S.Nurgaliyeva, G.Saduakas, L.A.Lebedeva & S.B.Zhoraeva. Professional Teaching Competence in Preservice Primary School Teachers: Structure, Criteria, and Levels. World Journal on Educational Technology: Current Issues, vol. 13, no. 2, pp. 261-271. (2021).
6. K.D.Buzaubakova, A.S.Amirova & A.A.Makovetskaya. Digital pedagogy: Textbook. – Taraz: "IP Beisenbekova A.Zh", p. 314 b. (2022).
7. H.Uzunboylu, A.I.Prokopyev, S.G.Kashina, E.V.Makarova, N.V.Chizh & R.G.Sakhieva. Determining the Opinions of University Students on the Education They Receive with Technology During the Pandemic Process. International Journal of Engineering Pedagogy, vol. 12, no. 2. (2022).
8. M.Saidi & F.Cheraghi. Genre analysis of artificial intelligence research article abstracts: Local versus international journal: Genre analysis. Global Journal of Foreign Language Teaching, vol. 10, no. 2, pp. 111–119. (2020). https://doi.org/10.18844/gjflt.v10i2.4699.
9. European Commission. The European qualifications framework for lifelong (EFQ) Luxembourg: Office for Official Publications of the European Communities. (2008). https://ecompretences.eu.

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 5, May 2026
brightmindpublishing.com
ISSN (E): 3061-6972

10. G.U.Soldatova, T.A.Nestik, E.I.Rasskazova & E.Y.Zotova. Digital competence of adolescents and parents: Results of the all-Russian study. M.: Internet Development Fund. (2013).
11. Brief psychological dictionary. M.: Political literature, p. 317. (1985).
12. B.A.Ospanova. Scientific foundations of the formation of creativity of a future specialist in the conditions of university education. Monograph. Turkestan, p. 97. (2006).
13. Russian Pedagogical Encyclopedia: In 2 volumes. Chief editor Davydov V.V. M.: Great Russian Encyclopedia, p. 672. (1998).
14. M.E.Bershadsky & V.V.Guzeev. Didactic and psychological foundations of educational technology. Pedagogical search, pp. 10-11. (2003).
15. V.P.Tikhomirov. The world on the way of Smart education. New opportunities for development. Open education. Vol. 3, pp. 22-28. (2011).
16. K.Buzaubakova. The portal smart-pedagog. kz as means of increasing the digital competencies of future teachers. Incte, 22 6th International Conference on Teacher Education. Bragança, pp. 206-208. (2022).
17. G.J.Hwang. Definition, framework and research issues of smart learning environments a context-aware ubiquitous learning perspective. Smart Learning Environments, vol. 1, no. 1, pp. 1-14. (2014).
18. T.Inaltekin. Examining secondary students' perceptions of the technology-based learning and teaching in science courses. World Journal on Educational Technology: Current Issues, vol. 12, no. 2, pp. 71–83. (2020).