

INNOVATIVE AND DIGITAL EDUCATIONAL TECHNOLOGY METHODS USED IN DEVELOPING THE PROFESSIONAL COMPETENCE OF FUTURE SPECIALISTS

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Abstract: This article discusses the role of practical training in the process of personal development. Innovative and digital methods used to develop professional competence of future specialists, as well as the use of digital educational technologies to form an independent worldview of students and teach them critical thinking are discussed.

Keywords: Professional competence, competence, practical training, innovative method, model, transformation, reflexive assessment, blended learning technology.

In the context of globalization and digital transformation, one of the priority tasks facing the higher education system is the preparation of specialists who are adaptable to labor market demands, capable of independent thinking, and able to quickly adjust to professional activity. The effective solution of this task requires the modernization of the educational process on the basis of innovative approaches, particularly the integration of practical training content with digital technologies.

Modern pedagogical research indicates that the traditional reproductive model of education does not yield sufficient results in developing students' professional competence. Within such an approach, the student primarily appears as a subject who assimilates ready-made knowledge. However, the competency-based paradigm requires students to actively engage in professional activity, make independent decisions in professional situations, and conduct reflective analysis. From this perspective, the integration of innovative and digital educational technologies with practical training is regarded as a crucial condition for transforming the educational process into a transformational model.

The term "innovation" emerged in the mid-17th century from Latin roots and refers to the introduction of something new into a particular sphere, leading to changes within that sphere. Innovation is not merely the process of implementation but the transformation of novelty into a social practice. Innovative activity includes interconnected types of work whose collective implementation ensures the emergence of real innovations.

Currently, interest in applying interactive methods, innovative technologies, and pedagogical and information technologies in the educational process is steadily increasing. One of the reasons for this trend is that traditional education previously focused on teaching students to acquire ready-made knowledge, whereas modern technologies teach them to search for knowledge independently, analyze it, and even draw their own conclusions. In this process, the teacher creates conditions for personal development, formation, knowledge acquisition, and upbringing while simultaneously performing managerial and guiding functions.

The role and significance of innovative technologies are extremely important. Knowledge and experience related to pedagogical technology, pedagogical mastery, and interactive methods ensure that students become knowledgeable and professionally competent.

The word “innovation” (from English) means introducing something new, while “technology” derives from the Greek words *techne* (art, skill) and *logos* (science). Thus, innovative technology implies a new approach to the forms, methods, and techniques of education and upbringing. Innovative technologies introduce novelty and change into the pedagogical process as well as into the activities of teachers and students, primarily through the use of interactive methods.

Interactive methods are often referred to as collective thinking methods and represent pedagogical influence techniques that constitute a component of educational content. Their distinctive feature is that they are implemented exclusively through the joint activity of teachers and students. Such pedagogical collaboration includes the following characteristics:

- encouraging students not to remain indifferent during lessons and compelling them to think independently, create, and explore;
- ensuring sustained interest in knowledge throughout the learning process;
- strengthening students’ motivation to approach each problem creatively;
- organizing continuous collaborative activity between teacher and students.

Some researchers mistakenly associate pedagogical technology solely with information technology and the use of technical means such as computers or distance learning tools. However, pedagogical technology is fundamentally based on the collaborative achievement of guaranteed results between teacher and student according to predetermined goals. If the selected educational technology ensures cooperative activity and leads both teacher and student to positive outcomes—enabling students to think independently, analyze, draw conclusions, evaluate themselves and their peers, while the teacher provides appropriate conditions—then such a process constitutes the true foundation of teaching.

Each lesson, topic, and academic discipline possesses its own specific technology. Pedagogical technology in the educational process is an individualized, goal-oriented, pre-designed pedagogical system aimed at achieving guaranteed outcomes based on students’ needs.

Today, innovative education is understood as education capable of self-development and creating conditions for the comprehensive development of all participants. It is developmental education. Modern educational content must not only provide disciplinary knowledge but also develop competencies corresponding to contemporary professional practice. Such content should be presented in multimedia formats transmitted through modern communication tools. Modern teaching methods are not based on passive perception of material but on active forms of competence formation grounded in student interaction and engagement in the learning process. Innovative technologies introduce changes into both the pedagogical process and the activities of teachers and learners.

Effective use of innovative technologies requires teachers to possess:

- knowledge, skills, and competencies in ICT;
- awareness of international experience in modern pedagogical technologies;
- mastery of didactic games and interactive methods;
- continuous acquisition of knowledge in advanced pedagogical technologies;
- the ability to transform knowledge into skills and competencies;
- effective use of active learning games during lessons;
- the ability to integrate internet resources into teaching;
- commitment to continuous professional self-development.

When organizing lessons based on innovative technologies, teachers may utilize technical tools such as computers, projectors, interactive boards, and others.



The greater the degree of innovation in a teacher's activity, the richer the educational content becomes. It must be acknowledged, however, that perceptions of innovative technologies and interactive methods in education are not yet fully stable or standardized. Each teacher may introduce innovation individually, often motivated by dissatisfaction with existing practices.

The primary goal of educational reforms in our country is to raise a highly moral, intellectually developed, and comprehensively mature generation capable of elevating the nation's future and enhancing its global reputation. State policy in personnel training aims at fostering fully developed individuals through a system of continuous education, where the individual acts both as a consumer and a producer of educational services.

Therefore, the knowledge and competencies that determine the future of the younger generation must be enriched through engaging lessons delivered by qualified educators and supported by high-quality higher education aligned with global standards. Engaging lessons stimulate future teachers' interest in their discipline and profession, strengthen their professional understanding, and enhance their potential.

In this research, innovative technologies are interpreted not merely as pedagogical novelty but as a didactic mechanism that manages students' professional formation. This approach made it possible to distinguish the following functions of innovative technologies:

- **Transformative function:** bringing educational content closer to professional activity;
- **Activating function:** increasing students' subjective cognitive engagement;
- **Integrative function:** ensuring harmony between theoretical knowledge and practical skills;
- **Diagnostic function:** enabling monitoring of competence levels.

As a result, the application of innovative technologies ensures the transformation of students from passive recipients of knowledge into active professional subjects. The study substantiates the necessity of applying innovative technologies not fragmentarily but as a unified didactic system. This system is based on the integration of various educational technologies.

Problem-Based Learning (PBL):

Problem-based learning technology develops students' analytical thinking by modeling ambiguous situations that may arise in professional practice. Within this approach, knowledge is not presented in a ready-made form; instead, students actively participate in identifying the problem, analyzing it, and selecting the optimal solution. As a result, the following competencies are developed:

- problem-solving thinking
- decision-making skills
- professional adaptability

Case Study Technology:

Case study technology is based on modeling real pedagogical processes and immerses students in the complex context of professional activity. This method not only develops situational thinking but also fosters communicative and social competencies.

The didactic value of case technology lies in its ability to integrate theory and practice into a unified cognitive space.

Project-Based Learning Technology:

Project-based activity encourages students to conduct independent research and engage in outcome-oriented work. This technology is particularly effective in developing the operational and reflective components of professional competence. During the project-based learning process, the student:

- sets objectives;
- plans activities;
- evaluates outcomes;
- conducts reflective analysis.

This prepares students for their future professional activity.

Digital Pedagogy:

Digital pedagogy increases the flexibility of the educational process and enables the creation of individualized learning trajectories. Research findings demonstrate the high effectiveness of the following technologies:

Blended Learning:

The integration of traditional and online learning enhances students' independent learning activity and promotes the development of metacognitive skills.

Microlearning:

Presenting information in small semantic blocks facilitates rapid knowledge acquisition and supports long-term retention.

Simulation Technologies:

By virtually modeling professional activities, simulation technologies prepare students for real pedagogical processes.

Analyses indicate that the effectiveness of innovative technologies depends on the following factors:

- professional orientation of the educational process;
- creation of a reflective learning environment;
- support for student engagement and active participation;
- availability of a diagnostic assessment system;
- a high level of technological competence on the part of the instructor.

Within this research, an integrative-didactic concept for developing professional competence was designed based on the integration of innovative and digital technologies with practical training.

The methodological novelty of this concept is reflected in:

- abandoning the isolated use of technologies and integrating them into a unified pedagogical system;
- transforming the educational process from a reproductive model to a transformational model;
- ensuring the formation of the student as a professional subject.

Accordingly, practical training becomes a dynamic educational space for developing professional competence.

Thus, the integration of innovative and digital educational technologies with practical training emerges as a strategic factor in developing the professional competence of future specialists, elevating the educational process to a qualitatively new — transformational — stage.

Figure 2.2 presents the “Integrative-Didactic Model for Developing Professional Competence.” This model was developed as a conceptual approach aimed at systematically organizing the process of professional competence development for future specialists based on innovative and digital educational technologies.

The theoretical and methodological foundation of the model is formed by competency-based, systemic, activity-oriented, and integrative approaches.

According to the modern pedagogical paradigm, professional competence is understood not merely as possession of knowledge, but as an integrative quality reflecting the ability to effectively apply knowledge in real professional activity, make independent decisions in problematic situations, and conduct reflective analysis.

Therefore, the proposed model is oriented toward transforming the educational process from a reproductive format into a transformational one. The conceptual idea of the model is to create an active learning environment focused on students' professional formation through the integration of practical training content with innovative pedagogical technologies and digital tools.

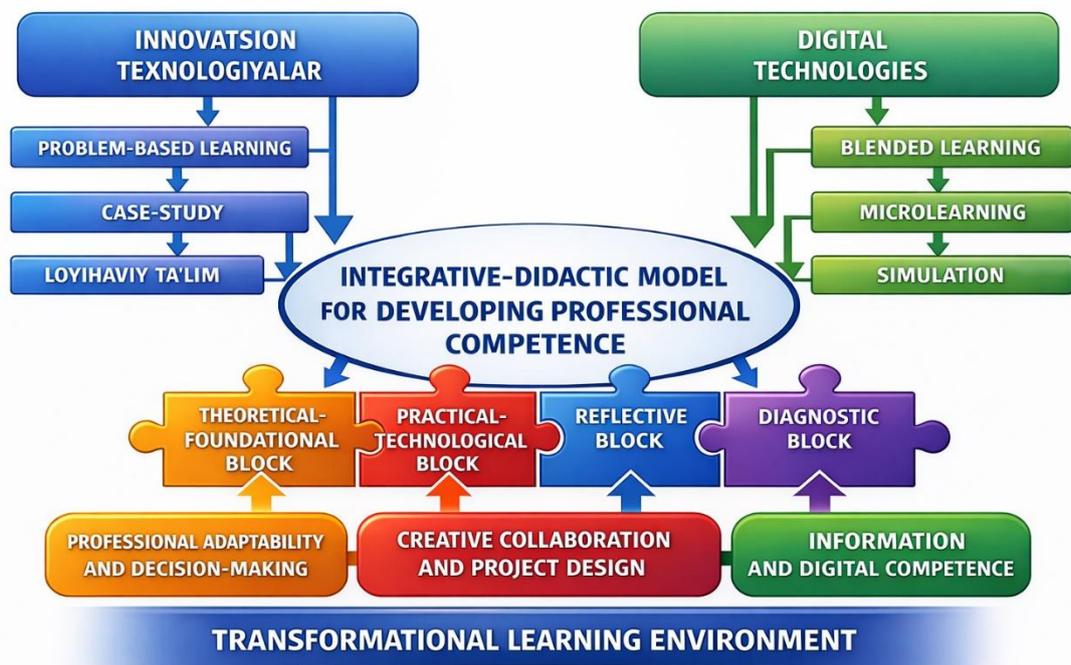


Figure 1. Integrative-Didactic Model for Developing Professional Competence

The model is based on the following didactic principles:

Principle of Systematicity – the development of professional competence is carried out through the interconnectedness and interdependence of all pedagogical components.

Principle of Integration – theoretical knowledge, practical skills, and reflective experience are integrated within a unified educational environment.

Principle of Activity – the student is transformed from a passive participant into an active subject of the educational process.

Principle of Professional Orientation – the content of education is brought as close as possible to real professional activity.

Principle of Diagnostic Orientation – the development of competence is regularly assessed based on defined criteria.

This model consists of four interrelated core blocks that together form a holistic pedagogical system for developing professional competence.

1. Theoretical–Foundational Block.

This block defines the scientific foundation for the development of professional competence and determines the goals, objectives, and methodological approaches of the educational process. Through this block, students acquire fundamental knowledge related to professional activity.

2. Practical–Technological Block.

As the central element of the model, this block provides for the implementation of innovative pedagogical technologies in the educational process. In particular, problem-based learning, case study, project-based activities, and simulation methods serve to develop students' operational competence.

3. Reflective Block.

Reflection, as an essential mechanism of professional development, enables students to analyze their own activities, identify mistakes, and determine individual development strategies. Through this block, metacognitive skills are formed.

4. Diagnostic Block.

This block serves to identify the dynamics of professional competence development. Diagnostics are carried out based on cognitive, operational, motivational, and reflective criteria, allowing for the adjustment and improvement of the educational process.

Within the model, innovative technologies are interpreted as transformative didactic tools. Through their application, the educational process achieves the following qualitative changes:

- activation of students' cognitive activity;
- development of independent learning skills;
- formation of professional decision-making experience;
- strengthening of collaborative competence.

Digital technologies, in turn, enhance the flexibility of the educational process and facilitate the creation of individualized learning trajectories.

As a result of implementing this model in practice, the educational process acquires a transformational character and makes it possible to achieve the following outcomes:

- formation of professionally prepared and competitive specialists;
- strengthening the transfer of theoretical knowledge into practice;
- development of students' independent thinking and problem-solving skills;
- fostering individuals prepared for continuous professional growth.

The scientific novelty of the model lies in the development of a holistic didactic system for fostering professional competence through the integration of innovative and digital educational technologies with practical training. The model is proposed as a methodological mechanism that facilitates the transition of the educational process from a reproductive approach to a transformational approach.

Thus, the developed integrative-didactic model defines the conceptual foundations for developing the professional competence of future specialists and contributes to elevating the educational process to a qualitatively new stage.

In the context of modernizing the higher education system, improving the quality of professional training for future specialists has emerged as one of the priority pedagogical issues. In today's increasingly complex labor market, specialists are required not only to possess deep theoretical knowledge but also to apply it effectively in practice, make prompt and well-grounded decisions in problematic situations, and demonstrate professional adaptability.



Pedagogical practice analysis shows that in higher education institutions the process of developing students' professional competence is often fragmented in nature, and the organic connection between theoretical preparation and practical activity is not sufficiently ensured. As a result, graduates' level of readiness for real professional activity does not fully correspond to modern requirements.

Furthermore, the predominance of a reproductive approach in organizing practical training limits students' independent thinking and leads to insufficient development of professional reflection and problem-solving competencies. This situation necessitates a methodological reconsideration of the educational process.

Although consistent reforms have been implemented in recent years to widely introduce innovative pedagogical and digital technologies into education, mechanisms for applying them as a unified didactic system aimed at developing professional competence have not been sufficiently elaborated. In practice, technologies are often used episodically, which does not produce the expected outcomes. This gives rise to the following contradictions:

- between society's demand for highly competent specialists and the existing methodological support for their training;
- between the need to organize education on an innovative basis and the insufficient systemic integration of technologies;
- between the requirement for students to develop as professional subjects and the reproductive nature of practical training.

Overcoming these contradictions requires a conceptual renewal of the educational process and the development of a holistic pedagogical system focused on professional competence development.

From this perspective, there emerges a need to create a model for developing the professional competence of future specialists in the process of performing practical training tasks through the integration of innovative and digital educational technologies with practical training (see Figure 1). This model ensures the integration of theoretical knowledge and practical activity, activates students' independent learning, and enables systematic management of the professional formation process.

In the context of modernizing higher education, the development of future specialists' professional competence has become one of the priority directions of pedagogical theory and practice. Globalization, digital transformation, and the rapidly changing demands of the labor market require a shift from a reproductive knowledge-based paradigm to a competency-oriented educational model. The theoretical premise of this methodological model is that a student's professional formation occurs most effectively precisely in the process of practical activity. Activity is not merely a means of reinforcing knowledge but the primary pedagogical mechanism for transforming knowledge into competence.

In this chapter, a methodology for organizing practical training aimed at developing the professional competence of future specialists has been developed and its pedagogical potential scientifically substantiated. The current state of organizing practical training in higher education institutions was analyzed, revealing that it is predominantly reproductive in nature, which does not sufficiently foster students' independent thinking, professional problem-

solving abilities, or readiness for practical activity. This necessitates redesigning practical training on the basis of modern pedagogical approaches.

During the research, a methodological system grounded in competency-based, activity-oriented, and integrative approaches was proposed to enhance the effectiveness of practical training. This system is significant in that it ensures the integration of theoretical knowledge with practical activity, promotes effective decision-making in professional situations, and develops reflective analytical skills.

One of the key scientific outcomes of the chapter is the development of an integrative-diagnostic methodological model aimed at fostering the professional competence of future specialists through the integration of practical training. This model is based on the interconnection of target, methodological, content-technological, procedural, and diagnostic components, enabling the systematic organization of the professional formation process. In addition, pedagogical conditions that ensure the effectiveness of professional competence development were identified, including:

- bringing practical training closer to real professional activity;
- organizing instruction based on problem situations;
- using innovative and digital educational technologies;
- stimulating students' independent activity;
- implementing diagnostic assessment mechanisms.

The study scientifically demonstrated that integrating modern pedagogical technologies such as problem-based learning, case study, project-based learning, and blended learning into practical training contributes to the comprehensive development of the structural components of professional competence. As a result, the proposed methodology was substantiated as a holistic pedagogical system capable of elevating the professional training of future specialists to a qualitatively new level.

Thus, the developed methodological model and its implementation mechanisms require further validation through pedagogical experimental research at the next stage of the study.

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