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INNOVATIVE TECHNOLOGIES IN THE EDUCATION SYSTEM: TRANSFORMATION OF DIDACTIC PARADIGMS

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Abstract
The article examines the impact of innovative technologies on the transformation of didactic paradigms in the modern education system. The authors analyze the transition from the traditional knowledge-based paradigm to competence-based, personality-oriented, and digital learning models. Special attention is paid to the changing role of the teacher, as well as to the revision of methods, forms, and means of teaching in the context of digitalization. Based on the analysis of theoretical approaches, it is concluded that hybrid didactics is being formed, integrating the best practices of classical and electronic education.

Keywords: Innovative technologies, didactic paradigm, digital transformation of education, blended learning, artificial intelligence, personalization of education, competence-based approach.

Introduction

The modern education system is undergoing a stage of deep structural and substantive transformation driven by the rapid development of information and communication technologies (ICT), artificial intelligence, cloud services and immersive environments. The traditional didactic paradigm, based on the principles of “transferring ready-made knowledge from teacher to student”, demonstrates limited effectiveness in conditions where the volume of information doubles every few years and the competencies in demand quickly become obsolete. As A.V. Khutorskoy rightly notes, “education should move from the transmission of knowledge to the management of the student’s cognitive activity” [10, p. 54]. The purpose of this article is to identify the main directions of transformation of didactic paradigms under the influence of innovative technologies and to determine the contours of a new educational reality.

1. Evolution of didactic paradigms: from knowledge-based to digital

In the history of pedagogy, several successive paradigms are traditionally distinguished: knowledge-based (classical), behavioral (behaviorist), humanistic and competence-based. Each of them set a certain configuration of elements of the didactic system: goals, content, methods, means, forms and learning outcomes.

Innovative technologies not only modernize individual tools, but also initiate a change in the didactic paradigm itself. The main vectors of transformation are presented in the table.

Table:

Element of the didactic system	Traditional paradigm	Innovative (digital) paradigm
Goal	Formation of a system of knowledge, skills, abilities	Development of competencies, meta-subject skills, digital literacy
Role of the teacher	Main source and transmitter of knowledge	Facilitator, tutor, navigator in the information environment
Role of the student	Passive recipient of information	Active co-author of the educational process, subject of their own learning
Basic methods	Explanatory-illustrative, reproductive	Project-based, research-based, problem-based, gamification
Learning tools	Textbook, blackboard, chalk, posters	LMS, VR/AR, AI tutors, simulators, cloud services
Forms of organization	Classroom-lesson, lecture-seminar	Blended, hybrid, networked, project-modular
Nature of control	Summative (exam, test)	Formative, automated, portfolio, big data analytics

As can be seen from the table, innovative technologies lead to the decentralization of the educational process: the emphasis shifts from teaching to learning, from collective frontal influence to an individual educational trajectory.

2. Key innovative technologies and their didactic potential

Let us consider the most significant technological solutions that are changing the didactic landscape.

2.1. Artificial intelligence (AI) technologies

AI makes it possible to implement personalization of education on an unprecedented scale. Adaptive systems (e.g., Smart Sparrow, Carnegie Learning platforms) analyze the student's actions, identify typical errors, and adjust the learning trajectory in real time: they offer additional explanations, change the difficulty of tasks, generate individual exercises. The consequence is the transformation of the didactic principle of an individual approach from a declaration into a technological reality.

2.2. Immersive technologies (VR/AR)

Virtual (VR) and augmented (AR) reality solve the classical didactic problem of visualization. If J.A. Comenius called sensory perception the "golden rule of didactics", then VR/AR allow not only to contemplate a static model, but also to act in an artificially created but realistic environment. In medical education – to perform virtual operations; in engineering – to assemble mechanisms without material costs.

This moves learning from the level of "know" to the level of "can do in simulated conditions", lowering the entry threshold into real practice.

2.3. Gamification and educational analytics

The introduction of game mechanics (points, levels, achievements, leaderboards) motivates students and forms a system of prompt feedback. In combination with Learning Analytics – the collection and analysis of digital traces of learning activity – gamification turns into a powerful tool for the controlled formation of metacognitive skills. The teacher receives dashboards with detailed information about the time spent solving tasks, the number of attempts, areas of difficulty for each student, which allows timely adjustments to be made.

Didactic risks and limitations of digital transformation

Along with the obvious advantages, innovative technologies create new didactic problems. Among them:

- Fragmentation of knowledge. The hypertext structure and clip thinking formed by the digital environment can hinder the construction of a holistic scientific picture of the world.
- Reducing the role of interpersonal communication**.** Digital asceticism, excessive mediation of communication by gadgets impoverishes the emotional and value component of education, which has always been a strong point of pedagogy (humanism, ethical education).
- Increased cognitive load**.** The abundance of information channels and multitasking often reduce the depth of understanding instead of deepening it.
- The problem of digital inequality. Not all students and teachers have equal access to high-speed Internet and modern devices.

Overcoming these risks requires not the rejection of technologies, but their integration into a well-thought-out didactic system where personal development remains the priority.

The new role of the teacher in the context of paradigm shift

The transformation of didactic paradigms places qualitatively new demands on the teacher. From a "retranslator of textbook content", he turns into a designer of educational experience. His key functions today are:

- curation and verification of educational content (in an era of excess low-quality information);
- organization of collaborative and project activities of students using digital platforms;
- metacognitive support (teaching how to learn);

- formation of critical thinking and information hygiene.

Accordingly, the system of professional development for teachers should include not only technical training (mastery of LMS, AI tools), but also retraining in the field of new didactics. At the Nizami Tashkent State Pedagogical University, for example, modules on "Digital Pedagogy" and "Blended Learning Design" are being introduced, which reflects an awareness of these challenges.

Innovative technologies in education are initiating a change in the didactic paradigm: from transmission-knowledge-based to digital, personalized, competence-based. This transformation is not superficial (the introduction of individual gadgets) but systemic in nature, affecting goals, content, methods, forms, roles of participants and the control system. A hybrid didactics is being formed, which does not completely reject the classical heritage (principles of nature-conformity, visualization, accessibility), but fills them with new technological content.

The key condition for successful transformation is the training of a new generation teacher capable of working in an information-rich environment, designing individual educational trajectories and preserving the humanistic, educational dominant of education. Further research should be aimed at developing criteria for the effectiveness of hybrid didactic systems and methods for assessing the digital competencies being formed.

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