TRANSFORMATION OF THE PARADIGM OF VOCATIONAL EDUCATION IN THE AGE OF AI: FROM KNOWLEDGE CONTROL TO COMPETENCY VERIFICATION

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The current stage of civilization development is characterized by an unprecedented pace of technological change, which significantly transforms social, economic, and cultural processes on a global scale. Digitalization has ceased to be merely an auxiliary tool for optimizing individual processes and has become a fundamental foundation for the functioning of modern society, permeating almost all spheres of human life – from the economy, industry, and science to culture, communication, and education. Digital technologies are shaping new modes of interaction, altering the structure of employment, transforming the requirements for professional activity, and rethinking the role of humans in production and social systems.

In the context of the sustainable development paradigm, education acquires particular significance, serving as a key driver of long-term socio-economic transformations and the innovative development of society. It is through educational mechanisms that competencies are formed, defining an individual's ability to adapt to rapid changes, respond effectively to the challenges of the digital economy, and participate responsibly in the development of a knowledge-based society. At the same time, the contemporary education system increasingly faces a relevance crisis: traditional approaches to teaching and assessment, focused on knowledge reproduction and standardized evaluation of outcomes, no longer meet the demands of a dynamic labor market. The conditions under which technological changes occur faster than the full cycle of formal specialist training necessitate a reconsideration of the goals, content, and methods of education, as well as a transition to more flexible, adaptive, and competency-oriented learning models (Пригодій et al., 2019).

The implementation of artificial intelligence (AI) technologies in vocational education does not merely add new functional capabilities to the educational process. It requires

a complete reassessment of how learning is conducted, what we teach, and, most importantly, how the outcomes of educational activities are evaluated. Research indicates that educational institutions are already actively integrating digital platforms and analytical tools to optimize the learning process; however, in the course of digital transformation, they face limitations related to the digital literacy of both instructors and learners, as well as the imperfection of pedagogical models (Olan et al., 2022). In this sense, the digital transformation of education is not simply about process automation but involves the creation of adaptive learning systems capable of preparing specialists for a world that changes faster than a single cycle of formal education.

The role of AI in this transformation is dual: it serves both as an object of study and as an active agent within the educational environment. Artificial intelligence algorithms enable true personalization of learning by analyzing the pace at which each learner assimilates material, identifying knowledge gaps in real time, and suggesting optimal ways to address these gaps (Pryhodii, & Radkevych, 2025). Such personalization transforms the traditional architecture of the educational process: the teacher's role shifts from merely transmitting knowledge to acting as a mentor, facilitator of thinking, and ethical guide. In this context, education becomes not the accumulation of facts but the development of intellectual flexibility, which is critical for solving complex interdisciplinary problems of the modern world (de Bem Machado et al., 2024).

One of the most challenging aspects of digital transformation is the crisis of the traditional knowledge assessment system. Generative AI models are capable of instant content creation, rendering the traditional control of "factual knowledge" increasingly obsolete. In response, the educational system is compelled to shift toward competency verification – the ability of students to apply knowledge in practice, think critically, make decisions, and collaborate effectively. Research shows that AI-based automated assessment systems provide greater consistency and objectivity in grading compared to traditional methods; however, their implementation requires a high level of transparency, pedagogical moderation, and alignment with educational goals (Alfaleh, 2026). Assessment must move from evaluating the final product to focusing on the thinking process, the analysis of reasoning, and the ability to pose complex questions, thereby paving the way for the development of critically thinking professionals.

The concept of vocational education in the digital age is undergoing tectonic shifts. The traditional model, focused on a completed cycle of education and a fixed set of skills, is giving way to the concept of lifelong learning. The emphasis is on the ability to rapidly

retrain, integrate new knowledge and technologies into professional practice. Vocational education in contemporary institutions now aims to develop a holistic individual capable of self-regulation, self-development, and effective interaction with technology in a high-tech environment (Пригодій, 2024). The 21st-century learner must understand algorithms and have critical skills to collaborate with machines in solving real-world problems.

To understand the depth of these changes, it is useful to compare the requirements for a worker of the 20th century with those of the 21st century. The industrial era demanded a "function-specific" worker with a narrow specialization. The main virtues were discipline and precise adherence to instructions; education was viewed as a completed stage, and assessment focused on compliance with standards and the absence of errors in routine operational tasks. In contrast, the 21st-century worker is an "adaptive professional," whose key assets are learning agility, the ability to generate solutions in novel conditions, and cognitive flexibility. Within the framework of the Industry 5.0 concept, work has become project-based, and flexibility is valued more than stability (Гуржій, & Пригодій, 2025).

Despite the radical differences between eras, there is a fundamental commonality between 20th- and 21st-century professionals: the demand for a high level of intellectual culture and ethical responsibility. As a century ago, professionalism is grounded in logical thinking, communication skills, and critical analysis. The difference lies in how these skills are manifested: previously, the assessment of professionalism focused on the volume of accumulated knowledge and the accuracy of task execution; today, it emphasizes the ability to filter informational noise, the speed of decision-making, and adaptability in conditions of uncertainty. In a learning system incorporating AI elements, mistakes are no longer catastrophic but become part of an iterative process that fosters learning through analysis and corrective action (Congna, & Saad, 2025).

The digital transformation of education through the implementation of AI presents society with a challenge of global scale: to change the very philosophy of assessing success. The shift from knowledge control to competency verification means that education becomes a tool for developing human potential rather than merely transmitting facts. In the context of rapid technological change, it is critically important to create learning systems that foster independent thinking, creativity, and adaptability, while ensuring integration between knowledge, skills, and value orientations (Gurzhii, & Pryhodii, 2025).

Vocational education in the 21st century is not about preparing individuals to perform known tasks, but about developing the capacity to interact effectively with the unknown, rapidly integrate new technologies, and critically evaluate information. In this context,

education ceases to be a passive process and transforms into a dynamic, adaptive, and personalized space for development, where success is determined not by the volume of knowledge acquired, but by the ability to think independently, solve problems creatively, and apply knowledge responsibly in practical activities.

Thus, the transformation of the vocational education paradigm in the AI era encompasses not only the integration of advanced technologies but also a systematic rethinking of educational content, competency development, assessment models, and the forms of interaction among learners, instructors, and digital agents. It entails a shift from traditional knowledge control to competency verification, enabling the evaluation of the ability to apply knowledge in practice, think critically, make decisions, and work effectively in teams. This transformation fosters the development of flexible, autonomous, and responsible professionals capable of adapting to rapid technological change, actively contributing to the advancement of a knowledge-based society, and responding to the challenges of the global economy, science, and culture.

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ENHANCING DIGITAL AND ETHICAL COMPETENCE OF EDUCATORS AS A FACTOR IN THE EFFECTIVE USE OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN VOCATIONAL EDUCATION INSTITUTIONS

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The dynamic development of digital technologies and the rapid implementation of artificial intelligence (AI) tools are driving fundamental changes in the vocational