DIGITAL EDUCATIONAL ENVIRONMENT: CONCEPT, PRINCIPLES AND PEDAGOGICAL OPPORTUNITIES FOR COGNITIVE DEVELOPMENT

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Abstract. The article analyzes the scientific definition, main characteristics and five priority principles for creating the digital educational environment in higher educational institutions: interactivity, adaptivity, multimedia richness, connectivity and openness. Based on research by Prensky, Jurayev and Oqnazarov, the influence of the digital environment on students' cognitive development is substantiated. The relevance in Uzbekistan's education digitalization policy and social sector specialist training is demonstrated. Conditions for pedagogically effective use of digital environment opportunities are identified.

Keywords: digital educational environment, interactivity, adaptivity, cognitive development, pedagogical principles, Prensky

Introduction

The rapid development of information and communication technologies is fundamentally transforming the nature of professional activity and, consequently, the demands placed on higher education. The modern social sector specialist must not only possess relevant knowledge, but also be able to continuously learn, critically evaluate information flows, adapt to rapidly changing conditions and make evidence-based decisions in complex situations. These requirements point to the necessity of developing cognitive competence as a priority goal of professional training.

Given these conditions, the digital educational environment emerges not merely as a technical infrastructure for delivering content, but as a pedagogically purposeful space for developing cognitive competence. The digital environment, when properly organized, creates conditions for active cognitive engagement, reflective practice and collaborative problem-solving — all of which are essential for developing the key

components of cognitive competence. The Decree of the President of the Republic of Uzbekistan No. PF-60 of January 28, 2022 explicitly defines the development of specialists with high cognitive abilities as a strategic priority in the context of educational digitalization.

This article aims to analyze the theoretical foundations of the digital educational environment, examine the priority principles for its creation in higher educational institutions, and identify the specific didactic opportunities it creates for developing cognitive competence of future social sector specialists. The analysis draws on both international scholarship and Uzbekistan's emerging experience in educational digitalization.

Scientific Definition And Key Characteristics

The digital educational environment can be defined as a pedagogically organized information-communication space that provides learners with access to educational resources, interactive tools and collaborative platforms through digital technologies, enabling the development of knowledge, skills and competencies in both synchronous and asynchronous modes. This definition encompasses three essential characteristics: technological infrastructure (hardware, software, connectivity), pedagogical design (purposeful organization of learning activities) and cognitive affordances (the opportunities the environment creates for thinking, reflection and problem-solving).

Marc Prensky's (2001) influential distinction between 'digital natives' — those who grew up immersed in digital technology — and 'digital immigrants' — those who adopted it later in life — highlights the generational shift in cognitive styles and learning preferences. Today's university students are digital natives who process information in fundamentally different ways from previous generations: they prefer parallel rather than linear processing, tend toward random access to information, and are accustomed to immediate feedback. The digital educational environment, when designed with these characteristics in mind, can align with students' natural cognitive styles and thereby enhance learning effectiveness.

T.N. Jurayev (2022), in his doctoral research on improving students' educational-cognitive activity through digital technologies, identified three levels of digital

technology integration in professional training: informational (using digital tools to access and present information), interactive (using digital tools to facilitate learner engagement and collaboration) and transformative (using digital tools to fundamentally restructure learning processes and develop new forms of cognitive activity). The transformative level, Jurayev argues, is where digital technology most powerfully contributes to cognitive competence development.

Priority Principles For Creating The Digital Environment

Creating an effective digital educational environment in higher educational institutions is not a matter of simply deploying technology; it requires adherence to carefully considered pedagogical principles. These principles ensure that the technological affordances of the digital environment are harnessed in service of specific educational goals — in this case, the development of cognitive competence of future social sector specialists.

Table 1. Priority principles for creating a digital educational environment in higher education

1-sxema. PRIORITY PRINCIPLES FOR CREATING THE DIGITAL ENVIRONMENT

Regulatory Framework And Practical Experience In Uzbekistan

Uzbekistan has made significant strides in creating the regulatory and institutional framework for educational digitalization. The Law 'On Education' adopted in 2020 explicitly affirms the role of digital technologies in modernizing the educational process. The 'Concept for the Development of the Higher Education System of the Republic of Uzbekistan until 2030' sets ambitious targets for digital transformation, including the development of e-learning platforms, the introduction of adaptive learning systems and the digitalization of assessment processes.

Uzbekistan's Digital Education Policy And Practice

At the practical level, Uzbekistan's higher educational institutions are increasingly using both international platforms — Moodle, Microsoft Teams, Zoom, Google Classroom — and domestically developed resources such as EduMarket, Ziyonet and Edu.uz. T.J. Oqnazarov (2021), in his doctoral research on developing

informational competence in virtual technologies, demonstrated that purposeful integration of virtual platforms in professional training significantly enhances students' ability to work with information — a core dimension of cognitive competence.

However, research also reveals significant challenges in Uzbekistan's educational digitalization process. Uneven access to digital devices and connectivity, varying levels of digital literacy among teaching staff and the absence of systematic pedagogical preparation for digital teaching all constrain the realization of the digital environment's cognitive development potential. Addressing these challenges requires not only technical investments, but also systematic pedagogical development work aimed at equipping educators with the knowledge and skills to design cognitively rich digital learning experiences.

Didactic Opportunities For Cognitive Competence Development



The digital educational environment creates specific didactic opportunities that correspond to each of the four components of cognitive competence. For the motivational-value component, gamification elements, progress dashboards and personalized feedback systems support the development of intrinsic learning motivation and self-efficacy beliefs. For the cognitive component, access to diverse information sources, analytical tools and knowledge visualization platforms enables deeper engagement with content.

Conclusion

For the procedural-activity component, virtual simulations and case-based learning platforms allow students to practice applying knowledge in realistic social work scenarios without the risks associated with real-world practice. For the reflective-evaluative component, electronic learning journals, digital portfolios and peer

assessment systems provide structures for systematic self-monitoring and metacognitive development. The convergence of these opportunities in a single pedagogically designed environment represents a significant advance over traditional teaching approaches, which typically address these components separately and unsystematically.

The digital educational environment, when theoretically grounded, pedagogically purposeful and practically well-organized, represents a powerful platform for developing cognitive competence of future social sector specialists. Its key didactic opportunities — interactivity, flexibility, reflective tools, simulation capabilities and collaborative platforms — correspond to the specific components of cognitive competence that social sector professionals need. Uzbekistan's regulatory framework provides a strong foundation for expanding these opportunities; the key challenge is ensuring that this infrastructure is accompanied by the pedagogical design capacity needed to transform technological potential into actual cognitive development outcomes.

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