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A MODEL OF PERSONNEL TRAINING IN A DIGITAL UNIVERSITY

The article substantiates the conceptual foundations for developing a model of personnel training in a digital university as a new educational ecosystem focused on the needs of the digital economy. Considering the global transformation processes, digitalization of socio-economic relations, and the rapid renewal of the technological environment, the need to revise approaches to the organization of professional education is actualized. The model of personnel training in a digital university is positioned as a polystructural system combining content, organizational, procedural, and technological components. The model of personnel training in a digital university is positioned as a polystructural system that combines content, organizational, procedural, and technological components. The need to integrate digital literacy, interdisciplinarity, institutional openness, and intellectual autonomy into the educational process is indicated. The importance of the normative-legal, scientific, methodological, and empirical prerequisites that form the methodological basis of the modernized system of personnel training is highlighted. Modern international strategic documents (the UN Sustainable Development Goals by 2030, the UNESCO Qingdao Declaration, the European Union's digital strategy, OECD initiatives) that define global guidelines for the digital transformation of education are analyzed. It is determined that the digital university functions as a flexible educational platform capable of synergistically combining institutional resources, digital technologies, innovative educational practices, and labor market needs. The developed structural and functional model of personnel training includes cloud technologies, blended learning, microlearning, massive open online courses (MOOCs), and automated content curation tools. Particular attention is paid to the principles of fractality, equifinality, hierarchical coherence, and self-development as the theoretical basis of the new educational paradigm. Personnel training in a digital university is seen as a continuous process of forming professional competencies based on dynamic knowledge updating, development of critical thinking, self-education, and adaptation to digital work conditions. The effectiveness of this model is determined by its ability to provide high-quality staffing for the digital economy, increase the level of professional mobility and competitiveness of graduates.

Key words: *digital university, digital literacy, digital economy, professional competence, digitalization of education, digitalization.*

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МОДЕЛЬ КАДРОВОЇ ПІДГОТОВКИ В УМОВАХ ЦИФРОВОГО УНІВЕРСИТЕТУ

У статті обґрунтовано концептуальні засади розроблення моделі кадрової підготовки в умовах цифрового університету як нової освітньої екосистеми, орієнтованої на потреби цифрової економіки. З огляду на глобальні трансформаційні процеси, цифровізацію соціально-економічних відносин та стрімке оновлення технологічного середовища, актуалізовано потребу у перегляді підходів до організації професійної освіти. Модель кадрової підготовки в цифровому університеті позиціонується як поліструктурна система, що поєднує змістові, організаційні, процесуальні та технологічні компоненти. Вказано на необхідність інтеграції цифрової грамотності, міждисциплінарності, інституційної відкритості та інтелектуальної автономії в освітній процес. Висвітлено значення нормативно-правових, науково-методологічних і емпіричних передумов, що формують методологічне підґрунтя модернізованої системи кадрової підготовки. Проаналізовано сучасні міжнародні стратегічні документи (Цілі сталого розвитку ООН до 2030 року, Циндаоська декларація ЮНЕСКО, цифрова стратегія Європейського Союзу, ініціативи ОЕСР), у яких визначаються глобальні орієнтири цифрової трансформації освіти. Визначено, що цифровий університет функціонує як гнучка освітня платформа, здатна синергійно поєднувати інституційні ресурси, цифрові технології, інноваційні освітні практики та потреби ринку праці. Розроблена

структурно-функціональна модель кадрової підготовки охоплює хмарні технології, змішане навчання, мікронавчання, масові відкриті онлайн-курси (МООК), а також інструменти автоматизованого контент-кураторства. Особливу увагу приділено принципам фрактальності, еквіфінальності, ієрархічної узгодженості та саморозвитку як теоретичній основі нової освітньої парадигми. Підготовка кадрів у цифровому університеті розглядається як безперервний процес формування професійних компетентностей, що базується на динамічному оновленні знань, розвитку здатності до критичного мислення, самоосвіти та адаптації до умов цифрової праці. Результативність цієї моделі визначається її здатністю забезпечувати якісне кадрове наповнення цифрової економіки, підвищення рівня професійної мобільності та конкурентоспроможності випускників.

Ключові слова: *цифровий університет, цифрова грамотність, цифрова економіка, професійна компетентність, цифровізація освіти, діджиталізація.*

Problem statement. In modern conditions of rapid digital transformation of society, there is a need to revise traditional approaches to the organization of the personnel training system. A digital economy based on knowledge, innovation, flexible digital skills, and the ability to adapt to new technological challenges requires specialists of a new type – mobile, critical thinkers, capable of self-learning and functioning in digital platforms. In this regard, the digital university is seen as a promising model of educational space that should not only meet the needs of the labor market, but also provide for conceptually new architectonics of personnel training.

At the same time, the existing education system does not always keep up with the pace of digitalization and the requirements of the digital economy, which leads to a gap between the level of graduates' training and employers' expectations. The issue of forming a structural and functional model of personnel training that would integrate regulatory, scientific and methodological, organizational, and technological components into a single digital educational ecosystem remains problematic. That is why it is important to create a conceptually substantiated model of personnel training in a digital university that would meet the challenges of global digital transformation.

Analysis of research. The issues of digital transformation of the higher education system and the formation of a new model of personnel training are the subject of active scientific study both in the domestic and international scientific space. The works of Ukrainian researchers (Huk, Skliarenko, 2022; Kolodinska, Skliarenko, Nikolaievskyi, 2022; Skliarenko et al. 2024; Khomenko, Paustovska, Onyshchuk, 2024) substantiate the need to implement automated digital solutions in the process of modernizing enterprises and educational institutions. These researches emphasize the relevance of integrating digital literacy and developing the ability to self-education as basic components of the professional competence of digital age specialists.

Special attention in scientific researches is paid to institutional and socio-economic aspects of the functioning of digital universities. For example, researches (Lopuschnyak, Chala, Poplavska, 2021; Kubiv et al., 2020; Kozhyna, 2022) emphasize the strategic role of educational and digital ecosystems in ensuring sustainable development and personnel security. Another important work (Kadoić et al., 2018) presents models of digital maturity of higher education institutions. The presented researches form the scientific basis for the development of an effective structural and functional model of personnel training in a digital university.

The aim of the article is to substantiate the conceptual foundations for forming a model of personnel training in a digital university as an innovative educational ecosystem capable of ensuring the compliance of professional competencies with the challenges of the digital economy.

Presentation of the main material. The development of a scientific methodology for the transformation of the specialist training system for the digital economy requires reliance on a holistic concept that integrates the theoretical and methodological basis for the formation of a new educational paradigm. At the center of this concept is the digital university as a key platform for the formation of personnel potential capable of functioning effectively in the context of digital transformation, which is confirmed in researches on transforming information architecture of the university environment (Bobro, 2025: 57) and analysis of socio-economic determinants of sustainable development in the context of digitalization (Lopuschnyak, Chala, Poplavska, 2021: 1–2).

The conceptual approach to organizing personnel training in the digital economy through the prism of a digital university involves the integration of the principles of lifelong learning, interdisciplinarity, digital competence, flexibility of educational trajectories, and technological integration of digital solutions into all components of the educational process. This approach is consistent with the research conclusions that emphasize the importance of inclusive approaches to economic development and reducing social inequality through innovative educational policies (Kozhyna, 2022: 29–30). It allows to create the basis for ensuring human resources capacity within the dynamic digital labor market, which is constantly

transforming, in particular through the implementation of analytical models for assessing the digital maturity of universities (Kadoić et al., 2018: 229–230).

In the process of forming a model of personnel training, there was a need to identify the objective prerequisites that determine its content and logic of construction. These include:

– systemic and civilizational prerequisites related to global changes in the formats of labor, knowledge, and economic interaction;

– normative-legal bases that set the framework for the functioning of digital educational systems;

– research factors that provide the evidence base and innovative content of the model;

– empirical prerequisites derived from the analysis of digital learning practices, in particular during pandemic challenges and post-crisis periods.

Let us consider the systemic and civilizational prerequisites that are strategic in nature and determine the importance of transforming the organization of personnel training for the needs of the digital economy. The objective factors of intensification of transformation processes in personnel training include the following:

– global transformational shifts in the economic and civilizational development of the multipolar world;

– irreversible technological changes in industrial and social relations caused by digitalization and growing social and digital inequality;

– the need to form key digital and professional competencies based on the concept of lifelong learning of the working population to ensure sustainable economic development;

– the integrative nature of digital competencies, which requires an interdisciplinary approach to the development of a methodology for transforming the personnel training organization;

– the growing role of digital innovations in the socio-economic development of business entities, which leads to the formation of a digital labor economy;

– actualization of climate change consideration in the management system at all levels of economic activity.

Digitalization of education is changing not only teaching tools and methods, but also the very system of organizing personnel training. Innovative educational formats recognized by the international educational community (in particular, in UNESCO documents) represent a transition to a new paradigm, where digital literacy and competency-based approach become the basis of the educational process in a digital university.

Along with the systemic and civilizational prerequisites for developing the concept of organizing personnel training in the digital economy, it is important to know the basic international regulatory documents governing the development of the digital economy, digital education, and the formation of personnel potential. In particular, the 2030 Agenda for Sustainable Development emphasizes Sustainable Development Goal 4, "Quality Education," which defines equal access to inclusive and quality education throughout life (United Nations, 2015). The Qingdao Declaration reveals the potential of ICTs to transform the educational space (UNESCO, 2015), and the European Commission's "Shaping Europe's Digital Future" strategic document identifies the directions for the formation of Europe's digital society (European Commission, 2020). UNESCO's Education in a digital world strategy outlines the values, principles, and goals of digital education as a global priority (UNESCO, 2019), and the OECD's Going Digital initiative defines digital policies as the basis for improving the quality of life in the digital age (OECD, 2020). These international documents serve as a strategic basis for the formation of a model of personnel training in a digital university focused on global challenges and opportunities of digital transformation. Their consideration allows ensuring the regulatory and methodological consistency of educational approaches with current trends in the development of the digital economy at the international level.

The research prerequisites for the formation of the concept of organizing personnel training in the digital economy are leading interdisciplinary theories and conceptual approaches that provide a methodological basis for developing a model of personnel training in a digital university. Among these approaches, it is worth highlighting the general systems theory, which allows us to consider the educational model as a complex self-organized structure with dynamic internal and external relations (Kubiv et al., 2020: 251–252). Human capital theory considers education as an investment in the development of a competitive entity in the digital labor market (Kozhyna, 2022: 30).

The concept of intellectual activity and the knowledge economy emphasizes the role of knowledge, innovation, digital skills, and creative potential as the main drivers of development (Skliarenko et al., 2024: 52–53). The theory of competencies, including key and professional ones, forms a framework for designing educational programs according to the needs of the digital market (Khomenko, Paustovska, Onyshchuk, 2024: 1225).

The modern concept of the knowledge economy emphasizes the priority of intangible assets, educa-

tion, research, and information flows in ensuring sustainable socio-economic development (Lopuschnyak, Chala, Poplavska, 2021: 5). The theory of network interactions serves as a basis for rethinking the role of the digital university as a communication platform in the educational environment (Bobro, 2025: 57). The generalization of these approaches allows us to build a model of personnel training that combines systemic, flexibility, interdisciplinarity, and innovation – characteristics necessary for the effective functioning of a digital university in the context of global transformations.

It should be noted that the methodological position of the author's concept is formed under the influence of comprehension of a wide range of scientific approaches and integration of meaningful and scientific ideas, which together form a new vision of the methodology for transforming the organization of personnel training in the digital economy. The formation of such a methodology is carried out taking into account the specifics of empirical prerequisites that reflect the current challenges to the human resources, innovation, and technological sovereignty of educational systems.

The empirical factors that necessitate the transformation of the model of personnel training include:

− the complexity of the technological environment, in particular in the fields of microelectronics, computer calculations, new materials, and systems engineering, which requires the formation of appropriate competencies and interdisciplinary research cooperation;

− the reduction in the number of highly qualified specialists, which exacerbates the problem of updating the personnel potential;

− the decline in the quality of professional training and degradation of the content of labor functions;

− the emergence of new standards of quality of life in the leading countries of the world, in particular in the fields of health care, education, security, and housing and communal environment, which requires the adaptation of educational systems to global requirements;

− disproportions between the level of employees' qualifications and their motivation, in particular in innovative intensive spheres of production;

− limited financial incentive mechanisms and imperfect working conditions that do not contribute to the retention and development of highly qualified personnel.

A key role in the construction of the author's concept is played by a systematic approach that defines the principles of organizing personnel training in a digital university as an open, dynamic, and interconnected educational and innovative ecosystem focused on the needs of the digital economy.

In the scientific literature, the personnel training system is mostly considered in the context of professional education. It is interpreted as a set of normative-legal bases, professional and pedagogical potential, material and technical base of educational institutions that provide specialists training for various sectors of the economy (Yahodzinskyi, 2015: 94–97; Kubiv et al., 2022: 252–253).

An effective system of professional training and retraining of qualified personnel is recognized as one of the key factors in reducing personnel risks and enhancing personnel security. Personnel training is considered as a systematic and organized process of forming specialists who have the necessary amount of knowledge, skills, abilities, and communication competencies capable of effective work in various spheres of social development (Khomenko, Paustovska, Onyshchuk, 2024: 1225–1228; Skliarenko et al., 2024: 52–54).

The close relationship between the concepts of "personnel training" and "professional education" is due to the need to recognize and formalize the competencies acquired by employees. Normative regulation of acquired education in the fields where professional activity is of critical importance for society, such as education, medicine, public administration, mining, and the judicial system, is of particular importance (Huk, Skliarenko, 2022: 108–110; Kolodinska, Skliarenko, Nikolaievskyi, 2022: 55–57). At the same time, the obligation to regularly confirm professional competence creates risks of the emergence of an illegal market for forged documents, which, in turn, actualizes the need for state control and regulation of additional education (Kozhyna, 2022: 30–31).

In modern economic science, there is an expansion of the category of self-education – from individual learning to the concept of self-educational organizations. Such organizations implement policies to support continuous personnel training, provide open access to educational resources, courses, trainings, and encourage internal corporate knowledge and experience exchange.

These systemically important relations in the personnel training for the digital economy, in particular in the context of a digital university, are shown in Figure 1.

The formation of professional competencies in the personnel training system is based on regulatory and legal support in the areas of education, digital transformation of the economy and social and labor relations. The digital and socio-economic transformations of recent years have contributed to updating the terminology of the educational and labor regulatory

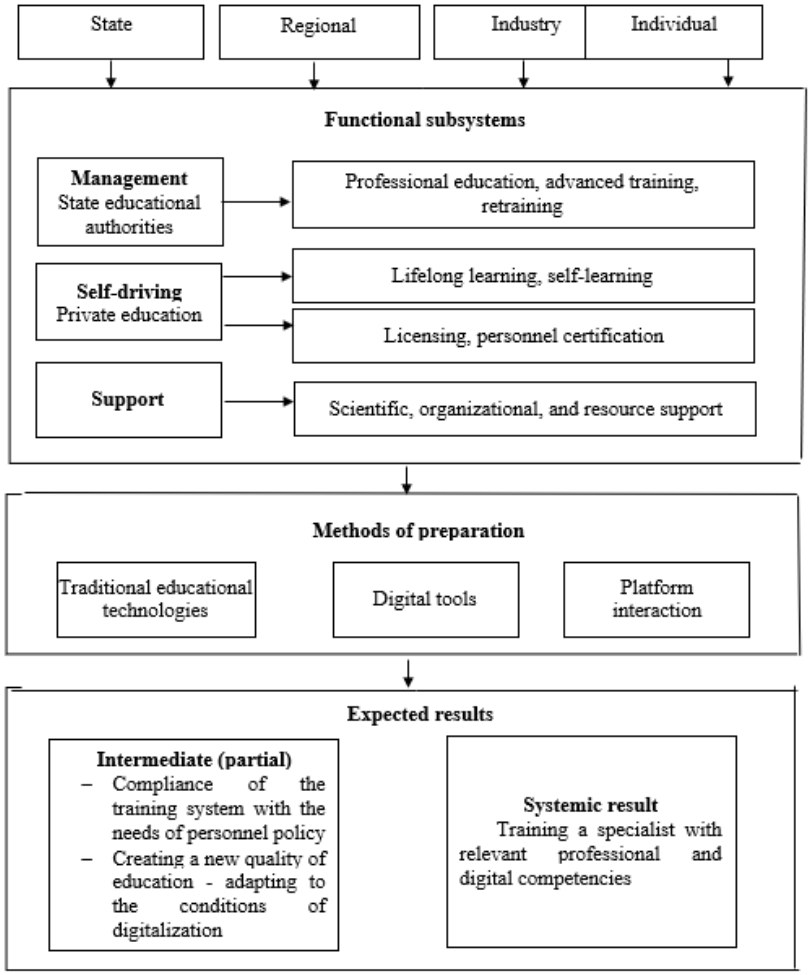

Fig. 1. Structural and functional model of personnel training in the digital university system

framework, introducing the concepts of permanent, temporary, and periodic remote work, regulations for its implementation, and forms of liability in cases of violation of the terms of employment agreements and contracts.

The organizational component of the personnel training system in a digital university includes both higher and professional pre-higher education institutions and stakeholders – management bodies, employers, students, and parents of applicants. All of them interact in a common digital educational environment in order to form modern personnel potential.

The content component of the model is based on a combination of basic and additional educational programs focused on a competence approach. At the same time, the key element is the integration of digital literacy as a universal competence that ensures the adaptation of general professional and professional skills to the requirements of the digital economy. Self-education programs are not so strictly regulated, but as part of formal training, the student must master the skills of critical selection of digital resources and educational technologies that meet the logic of a competency-based educational process.

The procedural component of the personnel training system should correspond to the structure and timeframe of educational programs implementation, as well as take into account the psychophysiological limits of information perception, especially in the context of self-study. The unity of organizational, pedagogical, and digital requirements must be met by all participants in the educational process – from the administration of the digital university to the academic staff.

The technological component ensures the use of digital economy opportunities in the educational process, including cloud technologies, e-learning and distance learning, open educational resources, blended and microlearning, massive open online courses. An important element is the function of a content curator – a specialist or system responsible for selecting, structuring, and adapting educational content to the needs of the target audience. In the digital university ecosystem, artificial intelligence tools that can pro-

vide automated management of educational content are becoming increasingly effective in performing these functions.

The digital economy has opened up new opportunities for continuous personnel training, including outside the formal professional education system. At the same time, at the stage of employment, the vast majority of employers continue to focus not so much on the real competencies of candidates as on the availability of official state-issued documents. This is especially true in the areas of public administration, healthcare, education, law, and other areas where the requirements for qualifications are set out at the regulatory level. In this context, the provisions of professional standards acquire priority, and the compliance of employees with qualification requirements becomes a prerequisite for employment in institutionally regulated sectors of the economy.

The analysis of the systemically important relationships in the personnel training in a digital university shows that the digitalization of the learning process significantly expands the functionality of the modern system of higher and professional pre-higher education. However, these processes are accompanied by the complexity of mechanisms for assessing and controlling the quality of the formed competencies. In this regard, the modernization of the personnel training model based on the principles of systematic, continuous, and openness, which can ensure sustainable staffing of the digital economy, is of particular relevance.

The proposed structural and functional model of personnel training in a digital university is organically integrated into the overall architectonics of digital transformation of the educational space. In this model, specialist training is seen as a polystructural educational and innovative ecosystem that combines technological, informational, humanitarian, and managerial components. At the center of this ecosystem is the student as an active participant in digital interaction, using artificial intelligence resources, adaptive platforms, open educational resources, and cloud solutions to acquire relevant competencies.

The formation and functioning of a model of personnel training in a digital university is a natural process based on such principles as hierarchy, the relationship between part and whole, subordinate coherence between the subjects of the educational process, equifinality as a plurality of ways to achieve a professional goal, self-development, and internal adaptability to change. In this context, a digital university is not only an educational institution, but also a fractal system capable of reproducing its key features at different levels – from an individual educational route to the macro policy of digital transformation.

Personnel training in a digital university is defined as a conceptually new level of the educational process that ensures the transition from discrete learning to continuous acquisition of knowledge, skills, and abilities. It is based on a competence approach focused on the flexible response of the educational system to the demands of the digital economy. This contributes to the transition from individual self-education to the formation of self-educational communities that function as living elements of the intellectual capital of the digital university.

The result of the effective implementation of the model of continuous personnel training in a digital university is the growth of quantitative and qualitative indicators of digital labor – a new type of professional activity characterized by a high level of intellectualization, reliance on digital technologies, and generation of both tangible and intangible assets.

Conclusions. As a result of the study, it is substantiated that an effective model of personnel training for the digital economy should be based on the principles of digital inclusiveness, interdisciplinarity, and lifelong learning. The digital university as a key element of this model is not only a new type of educational institution, but also an integrated innovation ecosystem that ensures flexibility, adaptability, and sustainability of personnel potential in the context of technological and socio-economic transformation. Its functioning is impossible without synchronization of regulatory, scientific and methodological, organizational, and technological support of the educational process.

The formation of a model of personnel training in a digital university is a response to global civilizational shifts that change the paradigm of knowledge, work, and professional identity. The systemic and civilizational, normative, research, and empirical prerequisites identified in the study became the basis for a conceptual approach in which education is interpreted as a dynamic, competent, technologically equipped environment capable of responding to the challenges of the digital economy. In this context, digital literacy, the ability to self-organize and operate digital platforms are basic elements of a graduate's professional readiness.

The proposed structural and functional model involves the implementation of the principles of fractality, hierarchy, equifinality, and self-development, which allows the digital university to function as an open, self-updating system. This ensures not only high-quality personnel training, but also the formation of a new culture of digital labor – intellectually rich, productive, and socially significant. As a result, such a model can be used as an analytical and strategic tool in the development of digital transformation policy in higher education and the labor market.

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