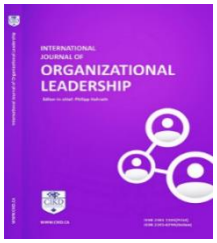

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Enhancing Digital Competences and Leadership in University Students for Professional Growth

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ABSTRACT

The digital transformation of social development determines new basic competencies of a graduate of a higher education institution. Against the backdrop of the rapid advancement of information and digital technologies, there is a transformation of the international labor market, which creates new conditions for professional training. The purpose of the research is to provide an extended analysis of the phenomenon of digital competencies in the educational environment of higher education as a key condition for high-quality professional training of students. The study determines the priority areas for the development of professional competence of modern specialists - hard (professional competence) skills, soft (universal) skills and digital skills. All of them are positioned as an integral prerequisite for the successful professional realization of graduates of higher education institutions in the current context of the international labor market. The research summarizes the methodological basis for higher education seekers' mastery of innovative competencies. The dynamics of digital skills in the context of 2019–2023 are analyzed. The possibilities of traditional and innovative approaches to professional training in the direction of higher education seekers' mastery of digital competencies, increasing their motivation, adaptability and ability to life-long learning and self-improvement are investigated. It is substantiated that the active integration of innovative pedagogical approaches into the educational process contributes to the effective formation of professional competence of students, which finds practical expression in the skills of rapid processing and analysis of information, intensification of professional and personal development.

Modern solutions in the context of upgrading the higher education environment, introducing innovative teaching approaches and tools in an integrated and globalized society, involve general and large-scale digitalization. The purpose of the process is to enable students to master the key skills of a modern specialist in any field, including communication, information and digital competence.

The methodology of forming digital competencies of modern students includes the introduction of blended and distance learning, the actualization of non-formal learning, the active involvement of the potential of immersive and virtual environments, interactive forms of lectures, and the use of targeted educational platforms. These methods are currently positioned as integral components of professional training and require the participants of the educational process to be ready to upgrade approaches and teaching methods.

The European integration vector of Ukraine's development necessitates taking into account European trends in the development of the higher education environment and determines the priority of creating a developed digital field for the functioning and development of the higher education system in the period of post-war recovery. Graduates of higher education institutions in Ukraine must possess the competencies established by international educational standards, and this actualizes the issues of the present research.

The purpose of the research is to provide an extended analysis of the phenomenon of digital competencies in the educational environment as a key condition for high-quality professional training of students.

Literature Review

The issue of upgrading the development strategy of higher education is multidimensional and is of great interest in the scientific field. Contemporary authors (Melnychuk, 2023) determine the strong interconnections between the active digitalization of educational tools and social development innovations, and also propose updating the methodological and pedagogical basis for the formation of high-quality digital competencies in professional training.

The aspects of the development of digital competencies of higher education seekers are the reason for the emergence of an active discussion among modern scholars (Caeiro-Rodríguez, 2021; Nurtanto et al., 2020; Qizi, 2020). At the same time, scientists focus on analyzing the processes of interdependence of the innovative development of higher education and the level of digital competence of graduates of vocational training institutions.

Global trends in the introduction of modern information and communication systems for optimizing the quality of professional training, as presented in Nurtanto et al. (2020), actualize the introduction of elements of immersive pedagogical solutions. In addition, the researcher analyzes interactive forms of presentation of educational materials, their potential in the context of high-quality professional training of modern specialists.

Pate (2020) focuses on the potential for personalizing the learning process through the introduction of individualized educational systems. Scientists are exploring the possibilities of blended, project-based, and flipped learning methodologies, prioritizing the maximum development of students' personal learning and creative potential, the development of non-traditional thinking, and the acquisition of digital competencies in the professional environment. Despite the achievements of scientists, a number of aspects of the studied issues remain unexplored, which actualizes scientific research in this direction.

Method

In the course of the research, a number of general scientific methods were used: various types of analysis, synthesis, comparison, generalization, and systematization. The analysis was used to provide a comprehensive theoretical substantiation of the key aspects of innovative educational development. Systematization and generalization were applied in the context of identifying the basic principles of research competencies.

Moreover, the systematic method was applied in the research in order to expand the study of innovative phenomena of innovative educational methodology as a systematic formation of the basic competencies of students. At the same time, innovative pedagogy was considered as an integral subsystem that functions on the basis of effective practices.

The method of comparative analysis was used to comparatively study several teaching methods, determine their specific features and identify standard features. Comparative analysis was used to identify the dynamics of the level of quality of acquired skills under the influence of digital technologies and traditional teaching methodology.

The method of scientific abstraction was used to optimize the array of theoretical information, definitions and characteristics, to detail the conceptual apparatus of the methodology of modern innovative education. Also, abstraction made it possible to define basic categories and concepts, to formulate generalizing conclusions of the research.

Results

The key professional competencies of a modern specialist in demand in the international labor market include the development of adaptability, critical thinking, communication skills, creativity, mobility, and the ability to continuously improve. All these skills are synergized in the direction of the rapid digitalization of the modern educational field, which requires the development of the following competencies.

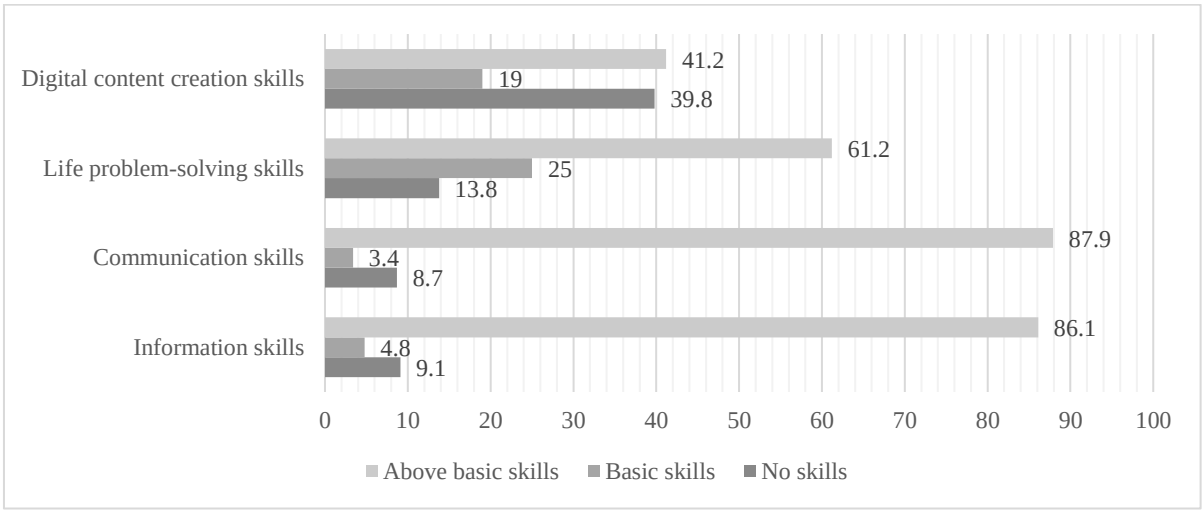
The process of professional development in higher education focuses on the formation of key categories of personal and professional skills that determine the competitiveness of a graduate – soft and hard skills, as well as digital competencies. While the process of acquiring the first two categories is determined by the pedagogical and methodological solutions of the modern educational process, digital skills mostly require the introduction of innovative methodological solutions (Melnychuk, 2023; Jerman et al., 2020).

The digital competence of modern higher education seekers is determined by the quality of the development of an innovative strategy for the progress of higher education. The latter is characterized by mobility and increased adaptability, the ability to quickly analyze and select information, and a practical focus on developing competencies in integrating electronic tools and services into professional and everyday life (Kennedy & Sundberg, 2020).

The current stage of social development is characterized by a rapid increase in the level of development of digital skills (Figure 1), which is driven by the processes of global digitalization.

Figure 1

Development of Digital Skills, 2019–2023



Source: Compiled based on (Ministry of Digital Transformation of Ukraine, 2023)

As shown in Figure 1, the level of digital skills increased by an average of 4-7% between 2019 and 2023. Communication skills were especially popular (87,9%), while the level of digital content mastery was the least popular (41,2%). In general, the trend of sustainable improvement of digital skills is due to the European integration vector of higher education development, which involves the introduction of innovative educational practices to create a unique experience for students involving visualization, practice-oriented learning activities, and modeling (Dolce et al., 2020; Kennedy & Sundberg, 2020; Nurtanto et al., 2020).

Pedagogical technologies based on elements of immersive learning and machine learning currently have a special significant potential. Their main potential is seen in the formation of incentives for the development of a critical perception of reality and the corresponding rapid analysis of information based on a creative approach to problem-solving (Kryvoshein et al., 2022). The strategy for integrating best teaching practices into the higher education system to develop students' digital competencies is presented in Table 1.

Table 1

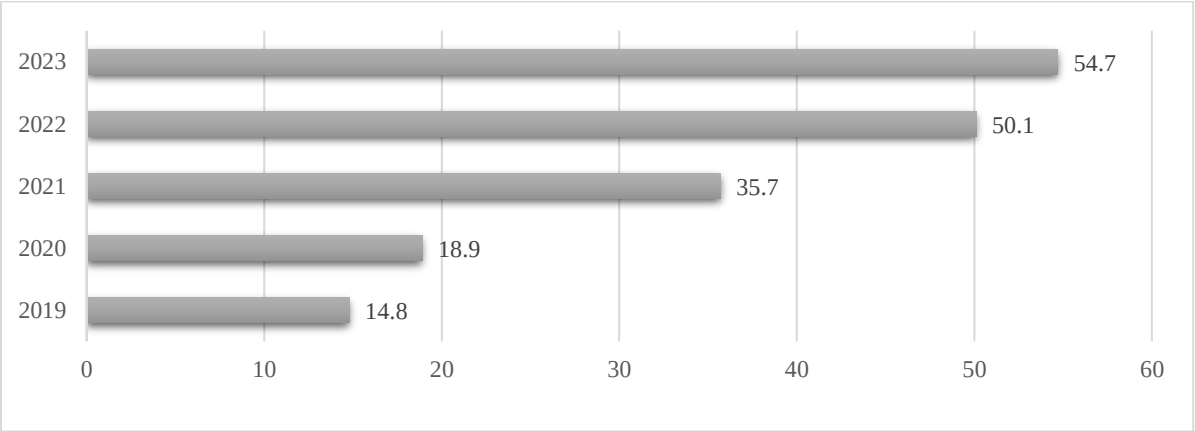
An Innovative Methodology for Developing Students' Digital Competencies

Methodological direction	Functionality
Blended or remote learning	The combination of online and traditional classroom formats, the priority of lifelong self-education, and the integration of online modules increase the level of adaptability of learning, promote the desire for self-improvement, and build sustainable motivation.
Flipped practice-based learning and self-study	Active stimulation of the skills of independent search, accumulation, selection and assimilation of a significant amount of information, as well as the skills of its critical analysis.
Online platforms	Targeted online resources that offer maximum opportunities for practical self-study. In addition to specialized training, online platforms contribute to the development of sustainable competencies.
Immersive technologies	Use of virtual or mixed reality elements for visualization.
Project methodology	Integration of targeted digital tools designed to plan, develop, adjust and present project results into the initial process.
Social methodology	Use of social media in online educational projects, which contributes to the development of communication competence, content development skills and digital skills.
Adaptive (personalized) learning	Technologies with elements of artificial neural networks adapt the learning material to the needs of professional training.

Ukrainian higher education institutions are now recognizing the need for students to acquire digital competencies and are actively implementing modern innovative solutions for this purpose (Figure 2).

Figure 2

Integration of Information Systems in Higher Education, %



Source: Compiled by the authors based on (Ministry of Education and Science of Ukraine, 2024)

The digital skills of higher education seekers assimilate a number of skills necessary for the smooth use of communication programs and global network capabilities in their professional and personal lives. These skills create the prerequisites for the competent use of digital information, improved communication and interaction in the digital environment, and the creation of digital content (Hawkridge, 2022).

Among the main digital competencies that serve as the basis for the career and professional realization of a graduate of a higher education institution, the following should be highlighted:

1) practical problem-solving skills using digital tools and the Internet;
2) digital financial literacy;
3) skills of social and communication interaction;
4) the ability to use various communication channels in practice;
5) creation and processing of digital content;
6) security skills for professional functioning on the Internet.

When analyzing European strategies for students' acquisition of digital competencies in the professional learning environment, it is necessary to note the tendency to prioritize targeted professional digital skills. This category also includes social media (Honchar et al., 2021).

According to the results of WearSocial research, there are more than 4.76 billion social media users in the global community (Succi & Canovi, 2020). The social competence of such users requires a high level of digital skills in search engine marketing (SEM), data analytics, content creation and editing. Modern graduates of higher education institutions, therefore, should have the skills to use augmented and virtual reality, mobile applications, SEO tools, practical use of YouTube, Instagram, etc. (Haleem et al., 2022).

Summarizing, it is worth noting that the methodological foundations for the formation and development of digital skills of higher education seekers as part of professional training should be systematized in the following areas:

1) ongoing self-education and self-improvement based on the experience of digital communications;
2) active implementation of digital tools in the educational process;
3) implementation of target and project tasks;
4) practice-oriented system of professional training.

Implementation of the potential of modern education requires determining the prospects for the development of modern higher education institutions as hubs for mastering all the necessary competencies within the framework of effective professional training.

Discussion

A number of modern scholars study the impact of digitalization on the formation of current requirements for the professional competence of graduates of higher education institutions. For example, Bauman and Lucy (2021) analyze modern approaches to educational methodology and the integration of innovative educational approaches, including interactive, machine learning, and elements of artificial neural networks. The authors also analyze the effectiveness of introducing online platforms into the higher education system.

At the same time, Burbules et al. (2020) explore the possibilities of immersive technologies for involving virtual and mixed environments in the system of practice-oriented learning, determining priority trends in the field of sustainable education. Alam (2021) argues for the need to actively promote the development of self-improvement and lifelong learning skills, which provide the basis for the formation of key competencies of university students in the process of mastering professional education in higher education. The authors emphasize the potential of artificial neural networks and analytics in the environment of higher education.

Zhao et al. (2021) and Touloumakos (2020) analyze the digital skills of modern students in the context of combining them with soft skills, emphasizing the close relationship with critical thinking, creativity, and communication skills. Researchers are studying the processes of higher education development through artificial intelligence (Chatgpt), updating the basic requirements for cybersecurity.

Reis et al. (2021) and Voropayeva et al. (2022), following up on this topic, focus on the transformation of the traditional methodology for assessing the level of competencies of higher education students in the context of digitalization. According to scientists, the focus should be on the practical aspects of modern professional training.

Putra et al. (2020) and Hernandez-de-Menendez et al. (2020) analyze the development of models for upgrading the higher education environment against the backdrop of the digital transformation of the global social environment. The authors emphasize the need to replace traditional algorithms with the maximum integration of online communication tools for consolidation and practical use of acquired skills, in the format of project-based learning, functional chats, media products, and mobile applications.

Dolce et al. (2020) and Sinambela et al. (2020) are convinced of the effectiveness of educational digital platforms in the context of individualizing the process of professional learning. The authors actualize the development of intelligent adaptive and expert learning systems that use the potential of artificial neural networks and personalization.

Most modern researchers consider digital competence as an integral part of the system of professional training of modern specialists in the higher education environment. At the same

time, the effectiveness of this process is determined by the pedagogical methodologies used, the dynamics of effective changes in the educational process, and the level of readiness of participants in the educational process for change.

Conclusion

The current concept of vocational training requires an upgrade of the higher education environment, which implies that students master a number of key competencies. Ensuring effective professional fulfillment and competitive opportunities in the modern labor market requires improving communication and social competence, developing sustainable analytical skills and mastering digital solutions.

Modern solutions include the use of project-based learning and online platforms, self-improvement and self-education, social methodology, and personalized learning. In general, the trend of sustainable improvement of digital skills is driven by the European integration vector of higher education development, which involves the introduction of innovative educational practices to create a unique experience for students involving visualization, practice-oriented learning activities, and modeling. Modern graduates of higher education institutions should therefore possess the skills to use augmented and virtual reality, mobile applications, SEO tools, and the practical use of YouTube, Instagram, etc.

The active integration of innovative pedagogical approaches into the educational process contributes to the effective formation of digital skills of students, which are practically expressed in the skills of rapid processing and analysis of information, intensification of professional and personal development, stimulation of critical thinking, flexibility and adaptability.

Declarations

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