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DIGITAL TRANSITION IN HIGHER EDUCATION: EUROPEAN EXPERIENCE FOR UKRAINE

Abstract. The digitalization transition capacity for Ukraine's higher education system based on European experience is explored in the article. The study addresses the critical challenge of assuring quality and academic integrity in the context of digital transition under martial law and post-war recovery. Digitalization is conceptualized not only as a tool for enhancing higher education quality but also as a new, measurable standard that provides openness, transparency, accessibility, efficiency, and accountability across all stages of educational activity. The research novelty lies in the identification and systematic analysis of specific regulatory and infrastructural barriers to the integration of European digital quality assurance practices into the Ukrainian context. Emphasis is placed on the synergistic relationship between digitalization and quality assurance mechanisms in higher education, which contributes to strengthening the international competitiveness of Ukrainian universities. Using a comparative analytical methodology and a systematic review of national policy documents, the article presents comprehensive findings and practical recommendations for the effective realization of digitalization's potential in Ukraine. At the national level, the need of development of a coherent strategy and a robust legislative framework with regard to data protection, rules for using digital tools in higher education, accreditation requirements for digital study programmes, digital ecosystem building in higher education is emphasized. At the institutional level, the focus is on developing and deploying digital platforms for monitoring quality, ensuring academic integrity, tracking student performance, and implementing adaptive teaching and learning practices. The integration of European technologies and practices, Artificial Intelligence for personalized learning is identified as a priority. The study's practical implications are significant for national quality assurance agency and university leadership, providing a framework for assessing digital readiness and prioritizing investments to meet European standards of quality, transparency, and integrity.

Keywords: higher education quality assurance; higher education digitalization.

1. INTRODUCTION

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Problem Statement. In the contemporary context, digitalization is recognized as a key factor in ensuring the quality of higher education. Digital technologies contribute to the optimization of management processes, the implementation of innovative teaching and learning methods, the improvement of assessing and monitoring learning outcomes, and the promotion of academic integrity. The digital transition of higher education creates the necessary conditions for enhancing transparency and openness in the educational process, improving the provision of educational services, and ensuring equal access to quality higher education – an issue of significant social importance.

The positive impact of digitalization on the quality of higher education is supported by the experience of the European Higher Education Area (EHEA). This includes the implementation of adaptive learning, automated assessment systems, digital accreditation mechanisms, and the development of electronic learning environments. The Tirana Communiqué emphasizes that the EHEA must respond to the continuous changes driven by social, economic, geopolitical, environmental, and technological developments, all of which have a profound impact on higher education. Digital transition demands an unprecedented level of innovation through new technologies, processes, and practices that foster positive change. They also require advanced levels of knowledge and skills that enhance student awareness, engagement, and responsibility.

The digital transition of higher education is of strategic importance in the context of Ukraine's integration into the European Union and the pursuit of sustainable development under martial law. However, challenges such as unequal access to digital resources, insufficient digital competence among students and academics, and the absence of a comprehensive national strategy for digitalizing higher education remain pressing. In this regard, research on the digitalization capacity as a tool for assuring and enhancing the quality of higher education becomes increasingly relevant within the broader framework of modernizing Ukraine’s higher education system and strengthening its competitiveness at the international level.

Analysis of Recent Studies and Publications. In today's rapidly evolving landscape of information and communication technologies and Artificial Intelligence (AI), coupled with the impact of global challenges – particularly the COVID-19 pandemic – the digitalization of higher education has emerged as a central direction in the transformation of education systems. The active integration of digital technologies into educational processes has become the focus of numerous research and practical initiatives, reflecting a growing recognition of the need for a systematic approach to digital transition in the field of education.

Various aspects of digital education quality assurance have been examined in a range of academic studies. For instance, V. Lugovoy, Zh. Talanova, and O. Vorobyova [1] explore regulatory and methodological frameworks, as well as the criteria and mechanisms for evaluating digital educational practices. A particular emphasis is placed on the adaptation of international quality standards to the specific context of Ukraine’s higher education system. In this regard, research dedicated to the development of information and communication competencies of students is also of significant relevance. For example, O. Spirin and T. Vakaliuk [2] propose methodological approaches to students’ education within the framework of Bachelor's programmes in informatics, incorporating the use of cloud-based educational environments. Simultaneously, the empirical research presented by V. Bykov, S. Litvinova, and O. Melnyk [3] on the effectiveness of game-based digital learning resources highlights the considerable potential of digital tools in enhancing the quality of education.

Foreign scholars also explore the impact of information and communication technologies on educational processes, particularly in relation to the transformation of organizational mechanisms and the management of educational activities within a digital environment. For example, H. Zhao [4] investigates the use of digital platforms in higher education; the experience of digitalization across European universities is presented by a team of experts

including K. Kokkinos, N. Samaras, and O. Iatrellis [5]; while the digital transition of universities within the framework of the European Universities Initiative is analyzed by P. Poszytek, J. Fila, and M. Jeżowski [6]. The issue of quality assurance in e-learning is central to the work of J. Vagarinho [7], and the quality of online teaching in European universities is examined by M. L. Torres-Barzabal, M. del Pilar Ortiz-Calderon, and M. D. Barcia-Tirado [8]. Moreover, A. Qurtubi [9] investigates digital-age transformations in education management as strategic innovations aimed at improving the quality and efficiency of education systems.

Despite the breadth of existing research, there remains a noticeable lack of systematic studies focused specifically on digitalization as a tool for assuring and enhancing the quality of higher education in the broader context of higher education system modernization and increasing its global competitiveness.

Aim of the study: determining the critical mechanisms and conditions for leveraging digitalization to strengthen the higher education quality assurance system in Ukraine based on European experience, thereby increasing the international competitiveness of Ukrainian universities.

2. RESEARCH RESULTS

The digitization of higher education is becoming not only a technological phenomenon but also a socio-ethical one, radically changing the approach to the organization of educational processes. The use of digital tools such as educational platforms, automated learning management systems (LMS) [10], and electronic control, monitoring, and assessment tools is creating a new ecosystem based on the principles of transparency, openness, accountability, and inclusion.

One of the main aspects of the transformation of the education system is transparency, which is ensured by the introduction of digital tools and platforms. Thanks to such technologies, all information related to the educational process, including class schedules, assessment results, attendance, and communication between participants of the educational process, becomes available anytime, anywhere. This eliminates the possibility of losing or distorting important information, which helps to ensure integrity in relations between students, academics, and the administration of higher education institutions. Thus, digital technologies serve as an effective tool for preventing corruption in the educational process. Automation of electronic monitoring and assessment reduces the influence of the human factor, minimizes subjectivity in assessment, and, accordingly, significantly reduces the likelihood of manipulation.

The aspect of data openness also deserves special attention. The integration of digital technologies into the activities of higher education institutions provides the opportunity to accumulate large amounts of data and make it accessible for analytics, monitoring, and optimization of management and educational processes and programs. The openness of this data ensures transparency in decision-making, creating conditions for public control. This, in turn, contributes to the formation of public trust in higher education institutions and supports democratic principles in their governance.

An important principle ensured by digitalization is the principle of inclusion, which provides equal access to quality higher education. Digital tools provide equal opportunities for all participants of the educational process, regardless of their geographical location, social status, or other limitations. Online courses, open educational resources (OER) [11], and adaptive technologies for individuals with special needs significantly expand the audience, creating an inclusive environment.

The issue of inclusivity in digital higher education deserves special attention. The use of adaptive digital technologies ensures accessibility of education for students with visual, hearing, or other disabilities, including the use of screen readers (JAWS, NVDA), digital

magnifiers, video materials with subtitles and sign language translation, voice interfaces, as well as systems with text-to-speech and speech-to-text functions, etc. [12]. Such tools enable the creation of an inclusive digital environment that considers individual educational needs and promotes equal access to high-quality higher education. Systems that provide personalized learning based on adaptive algorithms that adjust to the needs of students, considering their characteristics of information perception, level of preparation, and pace of learning, are also effective. The introduction of distance learning platforms with built-in accessibility features helps to avoid discrimination and contributes to assuring higher education quality. In addition, digitalization contributes to increasing the level of responsibility of each participant in the educational process. University teachers are required to be responsible for the effective use of digital tools and methods to improve teaching and learning, students are required to be responsible for learning and developing digital competencies, and the administration is responsible for adhering to standards of transparency and openness in educational activities. This accountability becomes an important factor in shaping an ethical culture, a quality culture in higher education.

Thus, digitalization is becoming the basis for a new standard of inclusiveness based on the principles of accessibility, openness, transparency, equality, and integrity. This standard established through digitalization is not limited to the adoption of technological tools but represents a comprehensive framework of measurable criteria aligned with the principles of the European Higher Education Area (EHEA). This framework envisions a system where transparency and accountability are guaranteed through automated monitoring mechanisms, open data access, and blockchain-based verification of qualifications, ensuring trust and reliability across all processes. Academic integrity is verified through the implementation of digital tools and platforms that minimize subjective human influence, thereby reducing the risks of corruption, bias, and manipulation. Furthermore, inclusivity and accessibility are measured by the capacity of the digital environment to adapt to individual learning needs through personalized educational trajectories and by ensuring equitable access for all participants, regardless of their geographical location or special educational needs. Thus, digitalization serves not only as a technological advancement but as a transformative mechanism for establishing a transparent, ethical, and inclusive higher education system that meets modern European standards and values.

Therefore, the introduction of such a standard of inclusiveness makes the educational process socially responsible, strengthening public confidence in higher education as the foundation for the sustainable development of society.

The introduction of digital technologies in higher education is radically changing approaches to quality assurance, offering tools that increase the transparency, efficiency, and accountability of educational processes. Among the technologies that affect the quality of higher education, it is worth noting electronic portals, blockchain systems, and platforms for monitoring educational achievements.

Modern electronic portals integrate all participants in the educational process into a single system, where students and academics have constant access to educational materials, class schedules, assessment results, and communication, among other resources. This avoids bureaucratic obstacles, improves time management, and ensures timely access to relevant information, ultimately contributing to the enhancement of higher education quality. Such technologies and systems create opportunities for automated collection and analysis of data on various aspects of the educational process, which facilitates the provision and assessment of the quality of teaching and learning, monitoring of student performance and learning outcomes, building individual educational trajectories based on adaptability, and planning educational resources. Thus, electronic portals act as strategic management tools aimed at achieving competitive quality.

Blockchain technologies are becoming the new standard in higher education quality assurance, offering an unprecedented level of transparency and data reliability. They allow the creation of digital records of students' academic achievements, issue certificates and diplomas, etc., and make it impossible to forge documents, ensuring the legitimacy of their origin. In addition, blockchain systems are used to create distributed databases that store information about students, study programmes, and funding resources. This promotes transparency in management and eliminates opportunities for manipulation and dishonesty. As a result, higher education institutions can build their reputation on the basis of open and reliable data, which increases trust on the part of students, employers, and society.

One of the key factors improving the quality and transparency of education systems in the EHEA is the introduction of blockchain technologies. A striking example of such an initiative is the experience of Estonia, which has become a leader in the use of blockchain for the certification of diplomas and educational qualifications. Estonia is one of the first countries to implement blockchain technology at the national level to ensure the integrity of public data and systems. One important example of the successful implementation of innovative digital technologies to ensure security and trust in government systems is the Estonian KSI technology. According to experts, this technology is a powerful tool for guaranteed data authenticity, providing a high level of protection and inter-system interaction. Researchers note that since 2008, Estonian cryptographers have developed KSI technology, which provides large-scale data authentication without relying on a centralized trust authority. This technology is used to ensure almost 100 % trust in government data in any situation, effectively countering internal threats and ensuring full interoperability of data between systems and countries in real time [13]. This highlights the importance of innovative approaches to ensuring data trust and security, which are critical to the effective functioning of modern information systems. For example, Estonia has introduced blockchain technology to verify diplomas and certificates that students receive after completing their studies at universities and other institutions [14]. Each diploma or certificate is entered into a blockchain-based register that is accessible and open for verification. This register allows employers, government agencies, other educational institutions, and organizations to quickly verify the authenticity of diplomas. Additionally, the system enables students and graduates to store a digital copy of their diplomas in a secure environment, separate from physical documents. Thanks to the use of blockchain technology, diploma data is protected from any unauthorized changes. Since the information is stored in a distributed register, it is impossible to falsify or alter diplomas without being detected. Verifying diplomas takes only a few minutes, which saves a significant amount of time and resources. The technology provides the ability to create a globally accessible diploma verification system, which is especially useful for students who plan to work or study abroad. Blockchain guarantees a high level of security, as all information is protected using cryptographic methods. The introduction of blockchain technology for diploma certification in Estonia is an important step in the digitization of higher education, increasing its transparency, efficiency, and security. This initiative not only ensures the reliability and authenticity of educational qualifications but also opens new horizons for international cooperation by simplifying the process of verifying diplomas on a global level. Estonia's experience with blockchain for verifying diplomas is direct proof of how digital tools make it impossible to forge documents and increase transparency and trust in qualifications.

Monitoring platforms such as Learning Analytics Systems [15] allow tracking students' learning progress even in real time. These tools collect data on task completion, class participation, test results, and interaction with learning materials and resources. Analysis of this data allows us to identify weaknesses in student learning and respond to problems in a timely manner. The use of such systems helps University teachers adapt teaching methods to the needs

of students, creating individual educational trajectories, and the administration can evaluate the effectiveness of study programmes and teaching staff based on objective indicators.

An important aspect of digitalization is the integration of these tools (electronic portals, blockchain systems, and monitoring platforms) into a single ecosystem, creating a cycle of quality management in higher education and ensuring transparency, efficiency, and objectivity at all stages of activity. A digital ecosystem of higher education represents a multi-level, integrated system of digital platforms and databases designed to provide continuous quality assurance and effective management within the higher education sector. It is based on the integration of existing national and institutional digital platforms and databases for the higher education quality monitoring, ensuring its ongoing improvement, as well as collecting and analysing data on student performance, faculty and student satisfaction, and the effectiveness of study programmes. Such an ecosystem enables government authorities and higher education institutions to engage in strategic planning and informed decision-making, grounded in real-time monitoring and data-driven insights. At the national level, the digital ecosystem encompasses integrated e-platforms and legislative frameworks such as the Unified State Electronic Database on Education (ЄДЕБО), the National Agency for Higher Education Quality Assurance's accreditation platform (Accreditation Database, NAQA. Wiki), Diia.Education, and the legal framework for data protection. This level supports strategic planning, national monitoring, and external quality assurance processes. At the institutional level, the digital ecosystem includes the internal, integrated systems of universities, such as Learning Management Systems (LMS), electronic student management portals (e.g., SITS: Vision, Magister), academic integrity monitoring tools, and Learning Analytics systems used for internal quality assessment, tracking student performance, and supporting adaptive teaching.

Thus, digital systems become the basis for the formation of an innovative approach to teaching and learning, focused on quality and effectiveness. Their development not only meets modern technological requirements but also contributes to the creation of an effective, inclusive, and integrity educational environment.

In the EHEA, digitalization plays a key role in shaping a modern inclusive educational environment. Automated systems for monitoring student performance have become an effective tool for improving the quality, transparency, and accountability of higher education. Such systems not only provide convenient data management but also contribute to the timely identification of problems and the provision of necessary support to students. One of the leading examples is the EWP (Erasmus Without Paper) Dashboard platform [16], which is designed to support academic mobility programmes and automates data exchange between higher education institutions, allows tracking of students' academic achievements, and simplifies administrative processes. This platform ensures transparency in the process of learning outcomes recognition, reduces the administrative burden, and integrates the educational space into the European context. The European organization EUNIS [17] supports working groups such as Student Mobility [18], which aim to improve data exchange between universities and promote cooperation in student mobility. This approach focuses on the use of data, increasing the efficiency of higher education institution management. And, for example, in the UK, universities use the SITS: Vision system [19], which provides student performance monitoring, electronic portfolio management, and course registration. It allows for the creation of transparent reports for accreditation agencies and contributes to improving the quality of the educational process.

The introduction of such systems in Ukraine will open significant prospects for the development of an inclusive educational environment. Automated monitoring systems will help adapt study programmes to the individual needs of students and ensure compliance with modern standards of transparency and accountability.

Online platforms for accrediting study programmes have become an integral part of the higher education quality assurance system in the EHEA, ensuring transparency, automation, and standardization of processes. One of the key platforms is DEQAR (Database of External Quality Assurance Results) [20], developed by the European Quality Assurance Register for Higher Education (EQAR). DEQAR provides quick access to accreditation reports carried out in accordance with European standards - ESG. This database is unique in that it not only promotes transparency but also supports universities in improving their internal quality assurance processes, which is one of the main priorities of modern European higher education.

For example, the Netherlands has a national platform called HAKA (Hoger Onderwijs, Accreditatie, Kwaliteit) [21], which automates the process of applying for accreditation of study programmes. The system enables universities to track all stages of the accreditation process, thereby minimizing delays and enhancing the efficiency of both higher education institutions and accreditation agencies.

In Germany, the FIBAA-Portal system [22], developed by the Foundation for International Business Administration Accreditation, is used for submitting accreditation applications, document management, and interactive communication between higher education institutions and the accreditation agency. This approach simplifies the entire process, makes it understandable for all participants, and ensures transparency, efficiency, and effectiveness of interaction between the parties, which contributes to improving the quality of accreditation procedures in the digital environment.

Poland has implemented the E-Akredytacja platform [23], which allows higher education institutions to submit applications electronically, automatically checking the compliance of study programmes with national standards. This platform also provides electronic monitoring of quality and generates detailed reports that are available to all stakeholders.

Thus, online platforms not only automate administrative processes but also contribute to the formation of a new level of ethical standards in the higher education system. They ensure data transparency, equal access to information, and reduce the risk of manipulation, which is critically important in the education area.

A key step in the higher education quality assurance in Ukraine is the introduction by the National Agency for Higher Education Quality Assurance [24] of an electronic platform for accreditation and the creation of a corresponding database of accreditation results (Accreditation Database (ICS) and a knowledge base (NAQA. Wiki), which accumulates frequently asked questions and answers, as well as other useful information for experts of the National Agency and for higher education institutions. The development of such an initiative based on European experience will not only harmonize higher education standards with European ones but also create a transparent and effective system that reduces the risks of corruption in the accreditation and evaluation of study programmes. After all, the focus is on the higher education quality assurance, which is possible thanks to the use of such modern electronic platforms for monitoring student progress and evaluating study programmes. The further development of the National Agency's platform in Ukraine should be aimed at providing accurate analytics that will contribute to the improvement of study programmes and the compliance of the educational process with the principles of the EHEA, identifying problems in educational processes and determining measures to eliminate them, as well as forming recommendations for adapting study programmes to changes in the labor market and employer requirements. This approach to the development of the digitalization of the higher education quality assurance system will make it possible to create a system of continuous enhancement of the higher education quality, which is assessed at all stages – from the development of study programmes to the graduation – and will help to increase confidence in Ukrainian higher education, ensure its competitiveness at the international level, and create opportunities for students to obtain a quality higher education that is recognized in the EHEA.

The use of analytics to improve study programmes is an important tool for enhancing quality and adapting courses to the demands of the times and the needs of students. The EHEA actively uses a variety of analytical platforms and technologies that allow universities to monitor student performance, identify problem areas in the educational process, and adjust study programmes in a timely manner. One of the main tools is Learning Analytics [25], which involves the collection and analysis of data about students. This data may include information about academic performance, class participation, interaction with learning materials, and much more. The LEAPS (LEarning Analytics and Practices in Systems) research group [26] is engaged in the study and implementation of Learning Analytics in educational processes. Their work is aimed at using data from learning environments to create technological solutions that support development in higher education. This approach allows universities to respond quickly to problems in the educational process and improve the effectiveness of teaching and learning.

In the Netherlands, analytics is used to monitor student progress, which helps to adjust courses and study programmes based on student performance and needs. For example, Utrecht University uses Learning Analytics to obtain data on student learning to enhance the quality of higher education [27]. This approach is an important tool in shaping and improving educational processes. It helps improve student support, cope with the growing number of students, and ensure the quality of higher education. In addition, the SURF organization [28] in the Netherlands promotes the safe and reliable use of learning data to improve higher education and support students. They help universities analyse learning data to better understand and support students, as well as to improve online learning materials.

These cases demonstrate how digital analytics can help to enhance higher education quality, making it more adaptable to modern requirements and dynamic changes in labor market needs. The integration of analytical technologies into educational processes allows higher education institutions to develop personalized courses, identify weaknesses in the educational process, and quickly implement adjustments, which increases the effectiveness of higher education. The introduction of such technologies in Ukraine could be an important step towards improving the national education system, ensuring more flexible and effective learning that meets the requirements of modern society and the needs of students.

Another successful example of the digitization of higher education is the Smart Sparrow system [29], an adaptive learning platform that allows the creation of interactive and personalized learning materials. Using data on student interaction with content, it adapts the educational process to the individual needs of each student, which contributes to increasing the effectiveness of learning. Smart Sparrow is trusted by over 700 education institutions and organizations around the world, covering various fields, including K-12 (education for children and adolescents), higher education, and companies [29]. These educational institutions and companies use Smart Sparrow solutions to create personalized and adaptive study programmes that help students achieve better results. The system is actively used not only in universities, but also in colleges and schools, which improves the quality of education and makes it more accessible and convenient for students with different levels of training and abilities. In addition, companies engaged in corporate training use the platform to create individual educational trajectories for their employees, which helps to increase the efficiency and productivity of teams. Thanks to its universal application and the ability to adapt study programmes to the needs of each user, Smart Sparrow is an important tool in the global educational ecosystem.

One of the main objectives of creating a unified digital educational area is to promote inclusion for all participants of the educational process – students, faculty members, administrative staff of higher education institutions, and other stakeholders. For students, this area offers access to essential learning materials at any time and from any location, facilitates interactive learning, and enables communication with other participants of the educational process. These platforms provide not only digital textbooks, manuals, and lectures but also

video materials, interactive tasks, digital modules for self-directed learning, as well as digital simulators and virtual laboratories.

A key feature of digital platforms is their capacity to adapt the educational process to the individual needs of each student, allowing for the creation of an individual education trajectory. This is made possible using adaptive digital technologies that analyse students' performance data and adjust instructional materials and assignments based on individual achievements, abilities, interests, and learning styles. Such a student-centered or personalized approach enables students to progress at their own pace, thereby enhancing the overall comprehension and retention of material. This is especially important for students with special educational needs, who require the use of digital tools, technologies, and teaching methods that are tailored to their abilities and specific requirements.

The unified digital educational area also incorporates tools and technologies for monitoring student performance, allowing for continuous analysis of their progress. These systems help identify learning gaps and enable timely adjustments to the educational process. University teachers are provided with detailed insights into students' academic performance, which enables the adaptation of teaching and learning methods and technologies, the development of individualized learning plans, and the provision of targeted support to students who are experiencing difficulties. One such platform is Magister [30], which is widely used in the Netherlands. This digital platform offers students and University teachers centralized access to all educational materials, grades, feedback, and other essential data. It also integrates various systems for assessment and performance monitoring, helping University teachers track student performance and promptly respond to any issues. Furthermore, a critical aspect of these systems is their capacity to foster openness and transparency. Students can independently verify their grades and track their assignment history, while academics can comprehensively review students' learning activity. This approach enhances trust among stakeholders and contributes to a more objective evaluation of academic achievements.

However, alongside the advantages of digitalization in higher education, certain challenges remain, particularly regarding the accessibility of digital technologies. Not all students or even faculty members have equal access to the internet or modern digital devices, which can create barriers to full participation in the educational process. Another significant concern is data security: the protection of personal data, intellectual property related to educational and assessment materials, and other sensitive information must be ensured to prevent data breaches and misuse.

Adapting international best practices in higher education digitalization to the Ukrainian context and, accordingly, further developing the existing digital platforms and databases in Ukraine, such as the Unified State Electronic Database on Education and Diia. Education represents a critical step toward the modernization of the national higher education system within the framework of European integration and under martial law conditions. Therefore, to ensure the systemic digitalization of higher education in Ukraine, it is necessary to develop an appropriate strategy and mechanisms, which should include the following components:

- a digital ecosystem based on the integration of existing national and institutional-level platforms and databases for monitoring the quality of higher education, ensuring its continuous improvement, and collecting and analysing data on student performance, faculty and student satisfaction, and the effectiveness of study programmes. This ecosystem would enable authorities and higher education institutions to engage in strategic planning and management, making evidence-based decisions grounded in real-time monitoring of the higher education sector;
- adaptation of best European practices in the digitalization of higher education, including the implementation of AI-based systems for adaptive learning, study programme accreditation, and other educational innovations; digital technologies aimed at

enhancing the quality of teaching and learning, improving the educational process, promoting inclusivity in higher education, and establishing effective governance mechanisms;

- a legislative framework harmonized with the principles and provisions of the EHEA**,** which would define and regulate the processes of digitalization in higher education, establish mechanisms for the evaluation and quality assurance of digital study programmes and their accreditation, ensure the protection of personal data, uphold academic integrity, and set standards for the use of digital technologies and tools within higher education institutions.

Thus, the effective digitalization of higher education in Ukraine requires a comprehensive approach that integrates infrastructure development, legal support, and the adoption of European experience. This will allow for significant improvements in the quality of higher education and ensure its alignment with modern standards and the requirements of the EHEA.

3. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

The digitalization holds significant potential for the successful development of the higher education system, serving as a new standard that ensures openness, transparency, accessibility, effectiveness, and accountability at all stages of educational activity. The integration of digital technologies facilitates the implementation of a student-centered approach, enabling the creation of individual educational trajectories to help each student achieve optimal results in accordance with their personal needs, capabilities, and aptitudes. This, in turn, supports equitable access to quality higher education through unrestricted availability of essential educational resources and information. Within this approach, the parameters of the “digital ecosystem” at the national (macro-) and institutional (meso-) levels were conceptually differentiated and defined, ensuring effective coordination, monitoring and continuous improvement of the quality of the educational process. At the same time, the criteria for a “new standard of higher education” have been substantiated, which is being formed in the context of digitalisation and is based on the principles of transparency, verified academic integrity and inclusiveness. This standard is seen not only as a technological update, but as a systemic transformation of the educational environment aimed at increasing trust, fairness and accessibility of higher education in Ukraine.

In this context, particular attention is drawn to the role of Artificial Intelligence (AI) as one of the most dynamic and promising instruments of digitalization. Rather than positioning AI as a threat, it is essential to promote a constructive approach grounded in the principles of partnership, open dialogue, and interdisciplinary collaboration. The future of higher education is not rooted in isolation from emerging technologies, but in their conscious and ethical integration as valuable tools within the educational environment. Such a model will enable the formation of a flexible, adaptive, and inclusive system of higher education – one that can respond to contemporary challenges and ensure sustainable development.

A comparative and analytical review has identified key regulatory and infrastructure barriers that slow down the effective integration of European digital quality assurance mechanisms. The main problems identified include the incompatibility of national legislation with personal data protection requirements, the fragmentation and incompatibility of national digital platforms, and the lack of a unified regulatory and technical environment for data exchange between higher education institutions and public bodies. Overcoming these barriers is a prerequisite for creating a coherent digital ecosystem for higher education that is harmonised with the European educational area.

Overall, the adaptation of European practices in Ukraine requires the development of infrastructure to support advanced digital technologies, the integration of international and

national platforms, and the strengthening of the state's role in ensuring equal access to quality higher education and digital learning resources. This will contribute to the creation of a more personalized, inclusive, and effective education system capable of meeting the demands of the modern world. The synergy between processes of quality assurance and the digitalisation of higher education significantly enhances the international competitiveness of Ukrainian higher education institutions.

Based on the identified barriers and analysis of successful practices, a three-level set of strategic recommendations has been developed, aimed at strengthening the role of digitalisation and increasing the international competitiveness of universities.

To fully realize this potential, the following recommendations may be proposed:

1. At the national level**,** attention should be focused on developing a comprehensive strategy for the digitalization of higher education and establishing an appropriate legal framework. This should include the protection of personal data of students and faculty members, clear regulations for the use of digital tools in higher education institutions, and specific requirements for the accreditation of digital study programmes. It is also important to foster collaboration with European partners, attracting investments and grants to adapt successful digitalization practices, integrate advanced digital technologies, and enable the shared use of databases, digital libraries, laboratories, and simulators within the higher education system. Furthermore, investments should be made in developing digital infrastructure to ensure equitable access to higher education and educational resources for all participants of the educational process. A key element in this process is the integration of existing national and institutional platforms and databases within higher education.
2. At the institutional level**,** higher education institutions should focus on the development of digital platforms for monitoring the higher education quality, ensuring academic integrity, and effectively tracking student performance. This includes the implementation of adaptive teaching and learning methods and the automation of learning assessment processes, which will reduce opportunities for manipulation and enhance the transparency of educational activities.
3. At the individual level**,** both students and faculty members should improve their digital literacy and competencies. They should actively utilize digital platforms for personalized learning, professional development, career guidance, and access to educational resources. Moreover, they should participate in the digitalization process by providing feedback and suggestions aimed at improving digital educational technologies and practices.

Prospective areas for further research in the higher education digitalization may include:

- the development of approaches to the evaluating the digital competence of students and academics, including evidence-based methods for enhancing the Conceptual Reference Framework for the Digital Competence of Academic Staff;
- the use of Artificial Intelligence to construct personalized educational processes, design individual learning trajectories, and develop adaptive technologies tailored to the unique needs and abilities of students;
- the improvement of mechanisms for evaluating, assuring, and enhancing the quality of digital study programmes;
- the application of blockchain technologies for the verification and certification of digital documents in higher education, ensuring their transparency, accessibility, and data security;
- the development of mechanisms for integrating digital platforms and databases in higher education for effective educational management and the creation of a unified digital ecosystem in higher education.

AUTHORS' CONTRIBUTION

Volodymyr Lugovyi conceptualized the study and provided overall scholarly supervision. Zhanneta Talanova contributed to the development of the theoretical framework and the preparation of key sections of the article. Olena Slyusarenko participated in formulating conclusions and interpreting the findings. Oksana Vorobyova conducted the literature review, developed recommendations, and contributed to editing and finalizing the article. All authors were involved in discussing the content and approved the final version of the article.

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ЦИФРОВИЙ ПЕРЕХІД У ВИЩІЙ ОСВІТІ: ЄВРОПЕЙСЬКИЙ ДОСВІД ДЛЯ УКРАЇНИ

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Анотація. У статті досліджується трансформаційний потенціал цифровізації в системі вищої освіти України крізь призму європейського досвіду. У дослідженні розглядається критична проблема забезпечення якості та академічної доброчесності в контексті цифрової трансформації під час воєнного стану та післявоєнного відновлення. Цифровізація концептуалізується не лише як інструмент підвищення якості вищої освіти, але й як новий, вимірюваний стандарт, що сприяє відкритості, прозорості, доступності, ефективності та підзвітності на всіх етапах освітньої діяльності. Новизна дослідження полягає у виявленні та систематичному аналізі конкретних регуляторних та інфраструктурних бар'єрів для інтеграції європейських практик цифрового забезпечення якості в український контекст. Акцент робиться на синергетичному взаємозв'язку між цифровізацією та механізмами забезпечення якості у вищій освіті, що сприяє зміцненню міжнародної конкурентоспроможності українських університетів. Використовуючи порівняльну аналітичну методологію та систематичний огляд національних політичних документів,

автори представиди у статті комплексні висновки та практичні рекомендації щодо ефективної реалізації потенціалу цифровізації в Україні. На національному рівні наголошується на розробленні узгодженої стратегії та надійної законодавчої бази щодо захисту даних, правил використання цифрових інструментів у вищій освіті, стандартів акредитації цифрових освітніх програм, побудови цифрової екосистеми для вищої освіти тощо. На інституційному рівні основна увага приділяється розробленню та впровадженню цифрових платформ для моніторингу якості, забезпечення академічної доброчесності, відстеження успішності студентів та впровадження адаптивних практик викладання та навчання. Інтеграція європейських технологій та практик, штучного інтелекту для персоналізованого навчання визначена як пріоритет. Практичні наслідки дослідження є значними для національного агентства із забезпечення якості та керівництва університетів і можуть бути взяті за основу для оцінювання цифрової готовності та визначення пріоритетів для відповідності європейським стандартам якості, прозорості та доброчесності.

Ключові слова: забезпечення якості вищої освіти; цифровізація вищої освіти.

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