

Article

Transforming Higher Education with Artificial Intelligence

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Abstract: This article examines the potential for applying artificial intelligence technologies in higher education. The author explores the ethical aspects of implementing intelligent systems, including issues of data privacy and academic integrity. The paper also provides an overview of modern digital tools used for adaptive learning and student assessment. The concept of the digital economy and information and communication technologies is explored.

Keywords: Digitalization, digital transformation, digital economy, artificial intelligence, adaptive learning, Network Activity Index, open online courses.



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1. Introduction

The development of artificial intelligence and innovative technologies is becoming a global trend, transforming socioeconomic systems. These processes are particularly relevant for higher education, which is called upon to develop human capital for the economy of the future. Leading universities around the world are actively experimenting with integrating AI into education and research, but a unified vision for an integration strategy has not yet been developed.

The increasing complexity of social structures and relationships, increasingly relying on modern digital technologies, highlights the need to develop a new type of economy, the primary tool of which is digital technology. This type of economy is commonly referred to in modern literature by terms such as "digital economy" and "digitalization."

2. Materials and Methods

This article draws on regulatory documents, international reports, and research papers from leading universities and researchers specializing in the use of AI in higher education.

3. Literature Review

A literature review reveals a terminological pluralism regarding the concepts of "artificial intelligence," "intelligent technologies," and "innovative educational practices." Some authors emphasize the technological aspect of AI, while others focus on its didactic potential. In this paper, AI in education is defined as a complex of intelligent technologies that transform learning, research, and university management.

Despite the growing number of publications devoted to AI in higher education, many issues remain understudied. First, a comprehensive understanding of the scale and dynamics of AI

penetration in universities has not yet emerged. Second, the benefits and risks of using AI in various aspects of university operations remain controversial. Third, scientifically sound models for the effective integration of AI into the university educational ecosystem are lacking.

This study aims to fill these gaps and offer a conceptual vision of the role of AI in the development of higher education. The work is based on a comprehensive methodological approach, combining quantitative analysis of a broad empirical base and qualitative methods. The results will allow for significant advances in understanding trends in the digitalization of education and the development of practical recommendations for managing innovation in universities.

Many international scholars have studied these concepts, including D. Bell, F. Weber and D. Bode, Machlup, A. Riis, A. Toffler, H. Hanamari and D. Wada, and K. Arrow. The term "digitalization" was first coined by Canadian scholar Don Tapscott in his 1995 book "The Digital Society: The Pros and Cons of the Age of Networked Intelligence" [4].

4. Discussion

Today, the term "digitalization" can be considered in both a narrow and a broad sense. Digitalization in the narrow sense refers to the transformation of information into digital form, which implies cost reduction and the emergence of new opportunities. Digitalization in the broad sense refers to a contemporary global trend in economic and social development based on the transformation of information into digital form, which should lead to increased economic efficiency and an improved quality of life. The beginning of 2020 has once again forced the entire world to address the issue of digitalization of education. This interest is driven by significant scientific and technological progress in the digital sphere, as well as the emergence of the coronavirus infection "COVID-19," which was quickly recognized as a pandemic. Currently, the education of the future is undergoing a digital transformation, extending beyond the timeframe of life and beyond the boundaries of educational institutions, leveraging the unique capabilities of network and digital technologies, and engaging all direct and indirect participants in the educational process. The role of the teacher is changing in the era of the digital economy, with new forms of teacher-student interaction emerging, known as networked interaction. [5]

Today, in the context of Uzbekistan, the scientific study of the patterns, trends, and opportunities for the development of the digital economy, in particular the extent to which modern information technologies penetrate various sectors of the economy, is particularly relevant. The success of large-scale reforms carried out in the country directly depends on the introduction of new innovations into the national economy. Therefore, improving the digital economy and scientifically studying its social, economic, political, and legal foundations play a crucial role. According to the Networked Readiness Index, proposed by the World Economic Forum to assess countries' readiness for the digital economy, Uzbekistan ranks 83rd out of 121 countries in this ranking. However, experts believe that Uzbekistan has the potential to accelerate digitalization.

In his Address to the Oliy Majlis, President of the Republic of Uzbekistan Shavkat Mirziyoyev identified the widespread introduction of digital technologies into all spheres of the country's socio-economic life as a priority. Thus, the State Program, adopted as part of the Year of Science, Education, and the Digital Economy, envisaged the development of the "Digital Uzbekistan – 2030" strategy.

Today, the digital economy accounts for up to 15.5% of global gross domestic product. Over the past 15 years, the digital economy has grown 2.5 times faster than global GDP. Our country plans to double its gross domestic product. The initial step toward the formation, implementation, and development of digitalization as a new innovative component of the economy was the adoption of Resolution No. PP-3832 of the President of the Republic of Uzbekistan, dated July 3, 2018, "On measures to develop the digital economy in the Republic of Uzbekistan." Essentially, this document represents a comprehensive strategy for the development of information technology in the country for the next decade. [2]

The next decade should be an era of change in higher education. The digitalization reform of

education entails equipping educational institutions with modern technology, namely computers with internet connectivity, information systems providing access to educational resources, the results of modern scientific research and development, and electronic scientific libraries in various languages.

5. Result

Digitalization enables the rapid and high-quality development of educational and scientific content related to innovative technologies.

This primarily involves the creation of digital electronic textbooks, manuals, and other educational literature, as well as the digitalization of the entire educational monitoring system.

Secondly, the digitalization of online learning will yield significant and expected results for both subjects and objects of the learning process. There is complete confidence that personnel trained using digital technologies will become professional pilots of our economy in the competitive global market.

The digitalization of education is leading to significant changes in the labor market and is aimed at reorganizing the educational process and redefining the role of the teacher. On the one hand, digitalization undermines the school's inherited, proven methodological foundation, while on the other hand, it creates accessibility to information in various forms.

Below are six ways to accelerate transformation at your institution. (figure 1.)

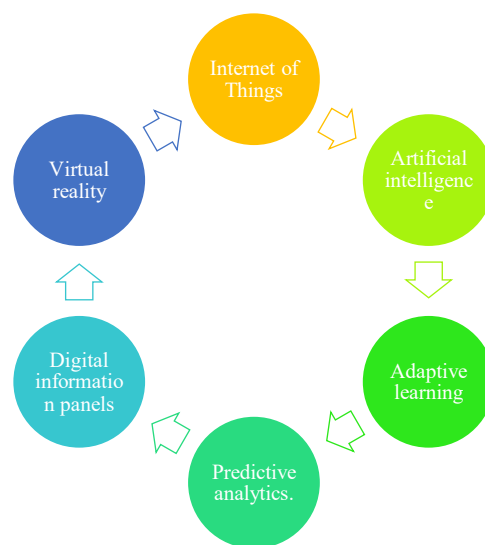


Figure 1. Opportunities to accelerate transformation in higher education.

Internet of Things. In education, interactive whiteboards and digital markers are among the popular IoT-enabled devices. Whiteboards help speed up and simplify the learning process by more easily receiving, confirming, and responding to information. Meanwhile, digital scanners facilitate the digital transfer of text to smartphones, thereby facilitating learning. Students can more easily interact with teachers and instructors located around the world. Using the IoT, educational institutions can promote collaborative environments, as students working in groups can transfer their data to a collaborative workspace simply by scanning a QR code or RFID tag with their smartphones.

Virtual Reality. Experiential learning has been difficult to achieve because of its high costs, but virtual reality is changing this. Virtual reality is transforming learning through interactive and dynamic experiences, allowing educators and students to interact with each other using a vast array

of interactive resources. In higher education, virtual reality has found several interesting applications. Virtual and augmented reality are examples of transformative technologies that help enhance learning and create engaging and engaging lessons for students. For example, an app like Cospecies helps students share their virtual creations with the world.

Predictive Analytics. Students tend to drop out of programming universities at various stages for various reasons. These can include socioeconomic factors, distance, choosing the wrong course, and difficulties managing curriculum schedules. While each of these issues can be addressed, predicting and identifying students most likely to drop out is difficult. This retention problem can be addressed by analyzing student data and using it to predict which students are most likely to drop out. Before a student plans to drop out, interventions, if applied at the right time, can help them continue their studies by providing the right decision.

Adaptive Learning. For years, traditional, one-size-fits-all teaching methodology dominated education, and adaptive learning represents a departure from all of this. Adaptive learning leverages data science, artificial intelligence, and machine learning to create scalable, personalized content that mimics one-on-one learning. This ultimately helps students master a topic before moving on to the next. For example, in HarvardX, an adaptive learning program offering online courses from Harvard University, students in the adaptive group mastered course materials significantly faster than those in the control group.

Artificial Intelligence. Since instructors can't always be on hand to answer students' questions, AI-enabled digital assistants and conversational assistants can be very helpful. Because they are based on subject-specific applications, primarily built on speech technologies such as language processing and artificial intelligence, they can help answer questions posed by students. They can be used as instructor assistants if properly trained to analyze and provide assessments and feedback to students, as well as virtual learning. Students from around the world also use technologies like Siri, Cortana, and Alexa to manage their lives, expecting these technologies to assist them in their education.

Digital Dashboards. With dashboard technology, extracting student data becomes easier. Instead of wasting time marking up work and Whether it's assessing classroom responses, one click is all it takes to obtain accurate data and report on key performance indicators. It not only provides organization-wide visibility into student achievement but can even provide the finest details. As issues arise, they are highlighted, and instructors or teachers can review learning areas and analyze performance to identify trends and monitor students.

6. Result

The integration of artificial intelligence technologies in higher education opens new horizons for faculty and students, creating unique opportunities for personalized and effective learning. While the use of technology raises a number of ethical and practical questions, the achievements achieved through its implementation demonstrate significant improvements in the quality of education and student engagement. This dynamic development encourages the teaching community to seek a balance between the use of AI and preserving the human aspect of learning, which will undoubtedly be an important step in shaping the future of the education system. Ultimately, the successful application of AI in education depends on the willingness of all stakeholders to adapt to changes and openly discuss emerging issues, thereby maximizing the potential of new technologies for achieving high levels of student learning.

REFERENCES

- [1] Resolution of the President of the Republic of Uzbekistan Sh.M. Mirziyoyev dated July 3, 2018 No. PP-3832 "On measures to develop the digital economy in the Republic of Uzbekistan."
- [2] Tursunkhodzhayev M.L., Tarakhtiyeva G.K. Tsifrovaya ekonomika kak novaya forma ekonomicheskikh otnosheniy Respubliki Uzbekistan // Vestnik nauki i obrazovaniya, 2019. № 10(64). Chast' 4. S.35-37
- [3] Kamneva V.V., Konyayeva Ye.A. Tsifrovaya ekonomika v obrazovanii // Voprosy studencheskoy nauki, 2018. № 3 (19) mart. str. 101-105
- [4] Zakirjanovna, Yuzbaeva Makhfuza, Mukumova Nargis Nuriddinovna, and Charshanbieva Bakhtiniso Ural Qizi. "Higher education in the era of digitalization." (2022).
- [5] Nuriddinovna, M. N., & Zokirovich, S. A. (2023). The Main Stages in the Development of the Digital Economy of Uzbekistan. Web of Synergy: International Interdisciplinary Research Journal, 2, 178-182.