International Journal of Evaluation and Research in Education (IJERE)
Vol. 14, No. 4, August 2025, pp. 3345~3354
ISSN: 2252-8822, DOI: 10.11591/ijere.v14i4.32777

Innovative technologies and educational quality: insights from Mongolia and Kazakhstan

Kanziya Kabassova[1], Khosbayar Nyamsuren[2], Antony D. Miller[3], Iurii Piven[4], Yuriy Kravtsov[5]
[1]Makhambet Utemisov West Kazakhstan University, Uralsk, Republic of Kazakhstan
[2]Otgontenger University, Ulaanbaatar, Mongolia
[3]Department of University International Relations, Otgontenger University, Ulaanbaatar, Mongolia
[4]Department of Surgery No. 3, Poltava State Medical University, Poltava, Ukraine
[5]Department of Sociology, Dniprovsky State Technical University, Kamianske, Ukraine

Article Info

Article history:

Received Oct 10, 2024
Revised Jul 11, 2025
Accepted Jul 16, 2025

Keywords:

Educational paradigm
E-learning
Interactive learning
Multimedia technologies
Real skills assessment
Self-development

ABSTRACT

The study explores the digital potential and prospects of advanced innovative technologies in higher education institutions, compared to global practices. The research is situated within the theoretical framework of socio-constructivist learning theory, emphasizing the role of digital technologies in facilitating collaborative learning environments. Findings indicate that digitalization and inclusive educational practices are evolving into central elements of educational strategies. This study highlighted specific case studies, such as the implementation of virtual reality and e-learning platforms at Otgontenger University, demonstrating their significant impact on enhancing student engagement and learning outcomes.

Corresponding Author:

Kanziya Kabassova
Makhambet Utemisov West Kazakhstan University
090000, 162 N. Nazarbayev Ave., Uralsk, Republic of Kazakhstan
Email: kanziyakabassova@gmail.com

1. INTRODUCTION

According to the Global Business Coalition for Education, more than 800 million young people across the world will by 2030 not have the basic skills necessary for the workforce [1]. In addition, in many countries, motivation to learn has substantially decreased and students have become alienated from the learning process. The "digitalization" of higher education and the transition of higher education institutions to blended and distance learning deserve special attention during the pandemic. Generally, digitalization in education occurs through the use of innovative technologies and is gradually moving away from the position of an additional component of education and becoming a valuable aspect of the industry. In terms of the development of new educational paradigms based on methodological innovations, fundamental changes in the educational paradigm cannot but affect the quantitative and qualitative indicators of educational activity reflected in this study itself. Furthermore, there are a limited number of quantitative studies that have examined the generality, effectiveness, and benefits of digitizing education [2], [3].

The main information studied by Kopackova *et al.* [4] concerns the interaction between humans and computers, which contributes to the main benefits of education. Humans use intuition, associations, and understanding of processes, while the function of computers is to perform precise calculations and expand the range of operations and long-term activities [5]. Monticelli *et al.* [6] found that with the advent of new technologies, such as artificial intelligence ("chatbots"), their use is becoming increasingly popular and widespread in various sectors, inclusive of education. A study by Ayanwale and Ndlovu [7] found no

correlation between ease of use, perceived usefulness, and behavioral intentions, suggesting that other factors and dynamics influence the adoption of chatbots for educational purposes.

Contrino *et al.* [8] noted the significance of creating and implementing innovative curricula for digital knowledge acquisition. Aydınlar *et al.* [9], Shafieek *et al.* [10] also identify student digital literacy levels, assessing teachers' innovation skills, and implementing a digital literacy plan in the curriculum can enhance students' digital competence. Most importantly, the digital knowledge of teachers should be assessed and improved to achieve greater digital competence in the educational environment [11]. Digital competence encompasses a considerable number of skills, including collaboration, knowledge management, communication, ethics and responsibility, content creation and knowledge, assessment, technical skills, and problem solving [12].

Mongolian education has undergone significant reforms aimed at enhancing teaching quality and addressing the challenges faced by educators. As outlined by Adiyasuren and Galindev [13], a crucial aspect of this transformation is the government's policy to increase the percentage of teachers with master's degrees to 70% by 2024, alongside mandatory training for teachers at key points in their careers. Additionally, the implementation of English as a compulsory subject has been emphasized in response to global trends, as noted by Marav and Choi [14], revealing that while teachers are generally positive about the shift towards English education, they face challenges including heavy workloads and insufficient professional development support. Furthermore, the significance of aesthetic education in fostering student engagement and learning outcomes has been highlighted by Bao and Bao [15], indicating that the integration of arts education can play a vital role in personal development and academic success for Mongolian students.

Kotorov *et al.* [16] emphasized the need for a robust educational structure. The researchers are convinced that there is value in continuous evaluation and adaptability in decision-making regarding the use of modern technologies. The study by Lei [17] on digital technologies and personal competencies in education has not sufficiently addressed the issues of knowledge acquisition and strategy use or the value of digital innovations in addressing teaching deficiencies in the research by Marzal and Vivarelli [18], as well as other studies analyzing socio-demographic variables, for example, the one by Zhang *et al.* [19] and identifying clear benefits of digital technologies and innovations.

2. METHOD

The study examined the use of digital technologies and innovations in Mongolia, Kazakhstan, China, the UK, and Ukraine, particularly the prospects for using innovative tools in educational learning. The study used SWOT analysis from Mongolia's Otgontenger University and Kazakhstan's Makhambet Utemisov West Kazakhstan University. Data collection comprised internal and external university examinations. The assessment categorized institutional advantages, threats, and development opportunities that affect educational performance using structured questions. This method examined the effects of digitalization on education, focusing on e-learning platforms, virtual reality, and multimedia technology. The institutions were selected as research subjects due to their active efforts to adapt to modern educational trends, which made them representative examples of digitalization in higher education within their respective countries. The selection criteria included the ongoing implementation of e-learning platforms, interactive learning tools, and virtual reality technologies. A total of 100 participants were involved in the study, including faculty members, administrators, and students from both universities.

The SWOT analysis used organized interviews and surveys to assess internal and external factors affecting digital transformation in institutions. Institutional reports, student feedback, and performance measures for e-learning platforms, multimedia tools, and virtual reality were analyzed. This thorough approach ensured that the SWOT analysis included these universities' current and future digitalization activities. The principal research method was a systematic analysis of the specific features of the development and implementation of innovative technological solutions in the modern higher education system in combination with the experience gained during the study of the development of modern higher education in Europe in the United Kingdom (UK).

The data from 38 empirical studies were systematically analyzed to evaluate the role of digital and innovative technologies in higher education. Statistical tools were used to quantify the frequency of successful outcomes linked to specific technologies, providing a comparative framework to evaluate the effectiveness of different digital tools. Qualitative content analysis was also employed to interpret non-numerical data, such as participant feedback and case study results, highlighting trends and challenges related to digitalization in education. Based on the analysis of the empirical studies, such platforms as Campus on Cloud, LMS 365, Classter, and Tesla EDU were identified and analyzed, determining the prospects for the Mongolian University of Otgontenger.

3. RESULTS

Innovations in education are aimed at raising the level of modern science, introducing the latest technologies, and using valuable information and communication tools. Accordingly, innovations relate to the content of education, its formal aspects, pedagogical means, functions, and goals of the subjects of educational activity – everything that in one way or another affects the educational sector in individual countries and the global educational space as a whole [20]. For this study, two definitions will be used. First, innovation is a complex activity focused primarily on creating, using, exploiting, and disseminating a new form, method, and technology in education. Second, digital technology is a discrete system based on a method of encoding and transmitting information that allows performing many different tasks in the shortest possible time, and it is the speed and versatility of this method that has made them so popular [6].

The use of innovations reflects the paradigm of modern educational society, where competitiveness and efficiency are considered important qualities [21], [22]. Innovative elements help to create a stimulating, effective, and interactive learning environment that contributes to the successful learning and development of students in the modern world, as shown in Figure 1.

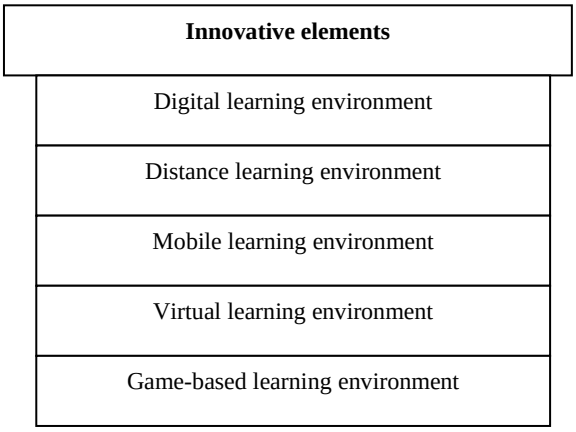


Figure 1. Innovative elements of the educational environment

The innovative learning environment requires diverse resources: material, physical, informational, educational, psychological, social, and organizational support. This enables students to produce creative and meaningful results. Students must understand new scientific developments, apply modern technologies, create innovative solutions, and balance human progress with environmental protection - all key challenges in modern education [23].

The process of digitalization within a higher education institution should incorporate more than just software and help manage and organize the learning process. The focus of this process is the use of digital technologies by teachers and students [24]. Since there is no perfect technology, a teacher must know all the pros and cons of the chosen digital resource to succeed. A teacher should prioritize subject matter, group dynamics, and preferences when adopting a technology. Knowing all the possible risks and challenges of using innovations and digital technologies as counselling tools in education, will help to avoid negative miscalculations and failures, as shown in Table 1.

Table 1. Strategy and practice of using digital technologies in education

Status of digitalization in education	Features of use among participants in the educational process
Innovative principles in modern educational practice	Elements of digital space are used by participants of the educational environment in the context of everyday and practical skills
Digitalization is an element of educational development strategies	Digital format is used as a set of digital skills that are defined in teacher education programs and training programs

Modern society requires innovations in the educational process. The areas of their use are presented more clearly in Figure 2. Tømte *et al.* [25] illustrated that the use of digital technologies could help provide personalized learning that is indeed tailored to the needs and interests of each learner. The classification of innovations in education is a rather complicated methodological task due to the complexity of the terms – "innovation" and "digital technologies", which also makes it difficult to unambiguously define the criterion

for classifying innovations. There are seven levels (orders) of innovation in education. Zero-order innovations are those that ensure the practical reproduction of the principal characteristics of the system (reproduction of the conventional educational system or its elements). First-order innovations are those that are characterized by quantitative changes in the system without any changes in quality. Second-order innovations are reorganizations of system elements or changes in the organization (new combinations of known teaching tools, changes in the sequence or rules of use). Third-order innovations are characterized by adaptive changes in the learning system in new situations, without going beyond the old learning models. Fourth-order innovations involve new solutions (simple qualitative changes in individual components of the education system, which usually extend the functionality of the education system to some extent); fifth-order innovations (change of all or most of the basic characteristics of the system) initiate the creation of a "new generation" education system (to some extent expand the functionality of the system). Sixth-order innovations result in the creation of a new educational system with a qualitative change in the functional characteristics of the system while maintaining the functional principles of the system. Seventh-order innovations are a more advanced and fundamental change in the educational system, where the basic functional principles of the system are changed.

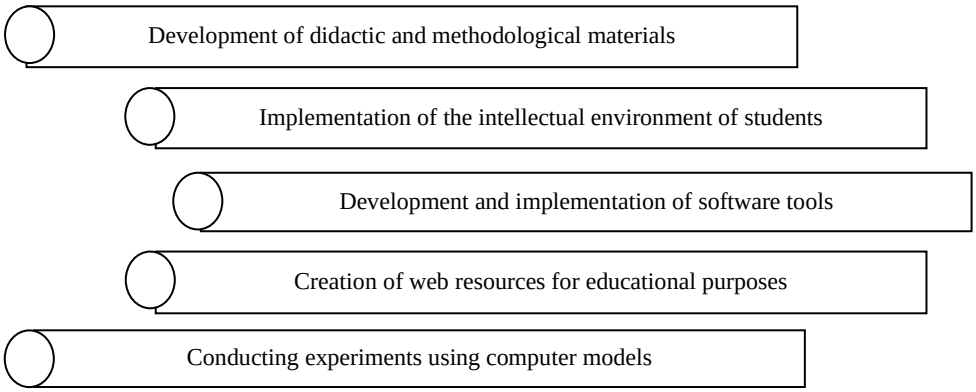


Figure 2. Areas of use of digital technologies in the educational environment

This transformation reflects an increase in the accessibility and quality of education but requires new skills and knowledge from the participants in the learning process, as seen in Table 2. Smart education is shaping a new model of the education system at all levels. This is because it is based on the systematic implementation and use of digital tools in the educational process. The quality assurance of educational outcomes is enhanced through meeting key requirements that encompass specificity (aligning professional education's structure and content with current social production needs), measurability (evaluating potential development levels), acceptability and reality, as well as ensuring realistic and acceptable conditions for students to acquire knowledge, develop skills, and master technologies, regardless of location or timing, to build essential general and professional competencies that address social development requirements within a specified timeframe [26].

Table 2. The role of innovation in improving the quality of the educational process

Education aspect	Role of innovation	Use cases
Accessibility to knowledge	Ability to provide access to a considerable amount of educational material	Online courses, video tutorials, platforms
Interactivity	Implementation of interactive lessons and training programs	Interactive presentations and tasks, web quests
Personalized training	Creation of an individual program for students and relevant tasks for them	Adaptive applications and platforms to accommodate the intended use
Interaction	Facilitating joint work of students and teachers on problems and projects	Interactive and smart boards for project creation
Skills development	Opportunities to develop problem and critical thinking, information literacy	Using applications to solve critical problems

Smart universities are defined differently in different nations, but they all aim to suit the needs of all education participants. A digital university or campus, where all students receive personalized data about resources, devices, and classrooms to help them work more efficiently and effectively, is closely related to this concept. For example, institutions using virtual reality and augmented reality, e-learning using adaptive technologies based on student analysis data to optimize learning, electronic document management to speed up management and save resources, and management and control systems [27].

Despite the many benefits and importance of innovation, globalization affects all areas of life, including higher education. Commercialization of education, which manifests as cost-cutting and competition, may encourage colleges to prioritize money over quality instruction. This can lower academic standards and education quality. The second issue is education disparity, as wealthy countries offer better higher education. Globalization boosts university rivalry for staff, research funding, and other resources. This can reduce university cooperation and stress students and staff. Technology challenges include unequal Internet and technology access and digital security risks. To prevent globalization from lowering education quality, these problems and hazards must be recognized. It is important to highlight the experience of using digital and innovative tools in teaching at universities around the world, which are exemplary for higher education institutions in Mongolia, as shown in Table 3.

Table 3. Analysis of the use of digital technologies and innovations in Ukraine, China, and UK [28], [29]

Tools	Ukraine	China	United Kingdom
Webinars and conferences	Actively used in higher education institutions, especially in the context of the COVID-19 pandemic and full-scale invasion	Widely used for organizing distance learning and lectures	Widely used, especially for distance learning and communication with students in remote areas.
Electronic platforms	Rapid development and application of various platforms in education, such as Moodle, Google Classroom	National platforms and systems are used	Widespread adoption, especially in universities and colleges. Various systems are used, such as Blackboard, Canvas
Electronic assessment systems	Universities are actively using the following for online test administration and submission	Widely used for feedback	Delivered in a variety of forms, including online tests, assignments, and learning resources
Mobile applications	Official university applications and communication platforms are used	Developed a wide range of mobile applications for training and learning management	Used for communication, access to learning resources, and other aspects of learning. The state has a wide range of online learning resources, including MOOCs (massive open online courses) and video tutorials

This is a general idea of the prospects for using innovative tools in education in each country, but specific approaches may vary depending on the university, participants' needs, and resources. Mongolian universities, like Otgontenger, are using digital technologies more. Mongolia is gradually introducing digital technologies, although certain parts are still unconnected. To improve remote education, the state has implemented e-learning programs for students and teachers [16]. Otgontenger University uses information and creative technology to better education. Table 4 lists Mongolian State University's strengths, weaknesses, opportunities, and threats.

Table 4. SWOT analysis of digital technologies and innovations in the educational process

Strengths	Weaknesses	Opportunities	Threats
Provision of access to a wide range of educational resources and materials; Motivating students through interactive teaching methods; Improvement of the efficiency of training, development, and facilitating feedback from all participants in the educational process; Improvement of the education's accessibility for all students.	Alienation from interactive communication and relationships; Dependence on technology and possible technical problems; Inequality in access to technical equipment and the internet; The possible distraction of students from other tasks during their studies.	Strengthening cooperation and communication between students and teachers.; Increased flexibility of learning, as students can access materials and assignments from anywhere and at any time; Support for the development of skills for the future labor market.	Potential increase in the cost of technical support and maintenance of infrastructure; Potential for rapid obsolescence of training materials and programs due to constant technological instability and updating.

Moodle, Teams, and Zoom are a selection of the most widely used learning management systems (LMS). Google Classroom also provides tools for this. It is particularly easy to use and integrate with others within Google services. Canvas additionally, provides tools for creating courses, monitoring student progress, grading, and communicating [30]. Mongolian universities use these highlighted LMS to provide access to

learning materials and communication between participants (especially Chinese students on postgraduate courses) in the educational process. However, there is still a range of educational platforms that need attention and use in education. First of all, this refers to Campus on Cloud, which is an information system for participants in the educational process. It is built on the Microsoft Azure cloud platform and provides rich functionality in a secure solution with a user-friendly, personalized user interface. The main components are content, workflows, student finance, cloud, analytics, and student center. The next one is LMS 365, which is essential for the modern digital workplace and is built on top of Office 365. The main components include content, LMS, and calendar. "Classter" is also a valuable next-generation education management software that has such components as academic management, assignments, timetable, online payment, library, CRM, student accounts, training, and transport. The software integrates with Moodle, Teams, Office 365, and One Note. Tesla EDU is an educational platform that is simultaneously a server, desktop, and mobile application for providing various educational services. Its e-learning platform for the enterprise is a set of integrated modules that manages the entire learning and teaching lifecycle, based on the Moodle LMS [31]. The analysis showed that the Classter solution best meets the identified needs of higher education institutions, as it is fully integrated with existing fragmented solutions, provides the creation of new demanded solutions, and allows them to be integrated into a single, holistic system.

4. DISCUSSION

The findings of the present study are consistent with those of previous studies [22], [25], [32], which point to the significance of digital technologies in creating new opportunities in various sectors, including education. Digital technologies enable the creation of interactive learning materials, personalized programs, and online courses [33]. This can motivate learners and increase the efficiency and flexibility of learning. The findings of the present study are also confirmed in previous study [28], [34]. They believe that digital technologies and innovations can help people learn in an emotionally comfortable environment while maintaining their motivation to learn and create new knowledge.

On the other hand, research shows that digital technologies can pose new challenges and problems for education [11], [12]. Unequal access to technology increases social and economic inequalities among students [18], [17]. In addition to the views, find that technology dependence leads to a loss of skills and abilities to solve real-world problems without the use of computers and other devices. Moreover, the use of digital technologies can increase the risk of breaches of student privacy and security. Previous research [10], [19] shared the importance of a balanced approach using appropriate digital technologies. The authors of the present study believe that this is not the only way to learn.

Discussing the implementation of the European practices, Kotorov *et al.* [16] note that in the last few years, society has gradually begun to understand the requirements that Moldova's participation in the pan-European Bologna process imposes on the educational environment. One of the main challenges is bridging the gap between university curricula and the education system and current trends in the labor market. Historical experience shows that the content of educational policy and approaches to its modelling has always been influenced by general trends in socio-economic, scientific, and cultural development in the world [35]. At the same time, in the study of innovation processes focus on new trends, identifying the term "innovation" with the processes of improvement, renewal, restructuring, and optimization [19].

Innovations are not only new ideas, but also the processes of their implementation, which are described by changes in activities, principles of life, and ways of thinking [36]. As a vital component of the national innovation system, modern higher education should transform its main functions in the field of professional education and research and become an integral part of the national innovation system. Specifically, the transfiguration of higher education institutions involves changing the content and main tasks of education in line with the needs of the economy and strengthening the role of institutions in applying scientific research and its results in the economy [37]. Foreign researchers have not ignored many of the issues raised, Senadheera *et al.* [38] note that a quality organization that integrates modern technology into the university system will create a valuable system, while the innovation potential will help to address the issue of quality improvement. The researchers note that this can help solve the problem.

Furthermore, innovative technologies in the higher education system are being introduced considering the European practices gained in Moldovan universities. At the same time, they are tools for solving the problem of improving information exchange in modern university education and effectively addressing the problem of individual orientation of students in developing the competencies necessary for their future profession. However, the introduction of modern innovations which will lead to modernity in universities requires appropriate preliminary training of teachers and students to understand the features of innovative technologies and develop the necessary competencies to master the techniques of their correct use.

5. CONCLUSION

This study underscores the vital role of digital transformation and innovative technologies in enhancing the quality of higher education. By examining the experiences of Otgontenger University in Mongolia and Makhambet Utemisov West Kazakhstan University, it was found that the integration of advanced educational technologies significantly improves accessibility, engagement, and learning outcomes. The findings reveal that embracing digital platforms, such as e-learning and virtual reality, is essential for modernizing educational practices and ensuring that institutions remain competitive in a rapidly evolving global landscape. However, it is important to acknowledge the challenges faced in this transition, including issues of technology dependence, data privacy, and inequalities in access to resources. Addressing these challenges is crucial for creating an inclusive and effective educational environment.

The research contributes to the existing literature on digital education by situating the findings within a socio-constructivist framework, which highlights the potential of digital technologies to facilitate collaborative and personalized learning experiences. As higher education continues to evolve, this study advocates for the systematic implementation of digital solutions, emphasizing that innovation is not merely an add-on but a fundamental aspect of modern educational systems. Further research should examine the adaptation of innovations to different cultural, social and economic contexts, and the stratification of the education system to improve the existing results.

FUNDING INFORMATION

Authors state no funding involved.

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Kanziya Kabassova	✓			✓		✓			✓		✓	✓	✓	
Khosbayar Nyamsuren		✓		✓	✓			✓	✓		✓			
Antony D. Miller		✓	✓			✓			✓			✓		
Iurii Piven		✓	✓		✓		✓	✓		✓				
Yuriy Kravtsov	✓				✓	✓	✓			✓	✓		✓	✓

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

ETHICAL APPROVAL

The research related to human use has been complied with all the relevant national regulations and institutional policies in accordance with the tenets of the Helsinki Declaration and has been approved by the authors' institutional review board or equivalent committee.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author [KK], upon reasonable request.

REFERENCES

[1] Global Business Coalition for Education, *Understanding the global education crisis*. New York: Global Business Coalition for Education (GBC-Education).

[2] A. E. Mochnacs, S. Pirciog, T. O. Sigurjonsson, and A. Grigorescu, "A conceptual review of the higher education system based on open innovation (OI) perspectives," *Humanities and Social Sciences Communications*, vol. 11, p. 423, Mar. 2024, doi: 10.1057/s41599-024-02909-6.

[3] J. Navío-Marco, A. Mendieta-Aragón, V. Fernándezde Tejada Muñoz, and M. R. Bautista-Cerro Ruiz, "Driving students' engagement and satisfaction in blended and online learning universities: Use of learner-generated media in business management subjects," *International Journal of Management Education*, vol. 22, no. 2, Art. no. 100963, Jul. 2024, doi: 10.1016/j.ijme.2024.100963.

[4] H. Kopackova, S. Simonova, and I. Reimannova, "Digital transformation leaders wanted: How to prepare students for the ever-changing demands of the labor market," *International Journal of Management Education*, vol. 22, no. 1, Art. no. 100943, Mar. 2024, doi: 10.1016/j.ijme.2024.100943.

[5] F. D. Guillen-Gamez, E. Colomo-Magaña, A. Cívico-Ariza, and T. Linde-Valenzuela, "Which is the digital competence of each member of educational community to use the computer? Which predictors have a greater influence?" *Technology, Knowledge and Learning*, vol. 29, pp. 1–20, Apr. 2024, doi: 10.1007/s10758-023-09646-w.

[6] J. M. Monticelli, P. Fossatti, L. de Quadros da Silva, and C. Bitencourt Soster Luz, "Innovative university: Evidence from university management," *International Journal of Educational Management*, vol. 38, no. 2, pp. 509–524, Mar. 2024, doi: 10.1108/IJEM-05-2022-0174.

[7] M. A. Ayanwale, and M. Ndlovu, "Investigating factors of students' behavioral intentions to adopt chatbot technologies in higher education: Perspective from expanded diffusion theory of innovation," *Computers in Human Behavior Reports*, vol. 14, Art. no. 100396, May 2024, doi: 10.1016/j.chbr.2024.100396.

[8] M. F. Contrino, M. Reyes-Milllán, P. Vázquez-Villegas, and J. Membrillo-Hernández, "Using an adaptive learning tool to improve student performance and satisfaction in online and face-to-face education for a more personalized approach," *Smart Learning Environments*, vol. 11, no. 6, Feb. 2024, doi: 10.1186/s40561-024-00292-y.

[9] A. Aydınlar *et al.*, "Awareness and level of digital literacy among students receiving health-based education," *BMC Medical Education*, vol. 24, p. 38, Jan. 2024, doi: 10.1186/s12909-024-05025-w.

[10] M. S. M. Shafieek, A. Ismail, and S. S. Razali, "Impact of digitalization on automotive technology curriculum concerning student psychomotor achievement," *Journal of Advanced Research in Applied Sciences and Engineering Technology*, vol. 37, no. 2, pp. 141–155, Jan. 2024, doi: 10.37934/araset.37.2.141155.

[11] X. H. Jia, and J. C. Tu. "Towards a new conceptual model of AI-enhanced learning for college students: The roles of artificial intelligence capabilities, general self-efficacy, learning motivation, and critical thinking awareness," *Systems.*, vol. 12, no. 3, p. 74, Feb. 2024, doi: 10.3390/systems12030074.

[12] M. Ö. Akçaoğlu, and B. K. Coşkun. "Digital competencies in the global curriculum landscape: A comprehensive analysis of countries educational approaches in the technology era," in *Educational Perspectives on Digital Technologies in Modeling and Management*, Hershey: IGI Global, 2024, doi: 10.4018/979-8-3693-2314-4.ch007.

[13] A. Adiyasuren, and U. Galindev, "Effective teaching in Mongolia: Policies, practices and challenges," in Effective Teaching Around the World: Theoretical, Empirical, Methodological and Practical Insights, R. Maulana, M. Helms-Lorenz, and R. M. Klassen, Eds., Cham: Springer, 2023, pp. 245–255, doi: 10.1007/978-3-031-31678-4_11.

[14] D. Marav, and L. J. Choi, "The implementation of English as a compulsory subject in Mongolia: EFL teachers' perceptions and experiences," *Forum for Linguistic Studies*, vol. 5, no. 1, pp. 13–27, Jun. 2023, doi: 10.18063/fls.v5i1.1514.

[15] B. Bao, and G. Bao, "Impact of aesthetic education on student learning outcome: Evidence from inner Mongolia," Educational Administration: Theory and Practice, vol. 29, no. 1, pp. 277–294, Feb. 2023, doi: 10.17762/kuey.v29i1.572.

[16] I. Kotorov, Y. Krasylnykova, M. Pérez-Sanagustín, F. Mansilla, and J. Broisin, "Supporting decision-making for promoting teaching and learning innovation: A multiple case study," *Journal of Learning Analytics*, vol. 11, no. 1, pp. 21–36, Mar. 2024, doi: 10.18608/jla.2024.8131.

[17] Z. Lei, "Dimensionalized goal orientation, innovation climate, and knowledge sharing behavior in higher education research teams," *Heliyon.*, vol. 10, no. 7, Art. no. e27853, Mar. 2024, doi: 10.1016/j.heliyon.2024.e27853.

[18] M. Á. Marzal, and M. Vivarelli, "The convergence of artificial intelligence and digital skills: A necessary space for digital education and Education 4.0," *Italian Journal of Library, Archives and Information Science*, vol. 15, no. 1, pp. 1–15, 2024, doi: 10.36253/jlis.it-566.

[19] H. Zhang, J. Chai, and C. Li, "On innovative strategies of youth sports teaching and training based on the internet of things and artificial intelligence technology from the perspective of humanism," *Learning and Motivation*, vol. 86, Art. no. 101969, May 2024, doi: 10.1016/j.lmot.2024.101969.

[20] C. Wang, and L. Si, "The intersection of public policy and public access: Digital inclusion, digital literacy education and libraries," *Sustainability.*, vol. 16, no. 5, p. 1878, Feb. 2024, doi: 10.3390/su16051878.

[21] K. Andriushchenko, V. Kovtun, O. Cherniaieva, N. Datsii, O. Aleinikova, and A. Mykolaiets, "Transformation of the educational ecosystem in the singularity environment," *International Journal of Learning, Teaching and Educational Research*, vol. 19, no. 9, pp. 77–98, Sep. 2020, doi: 10.26803/ijlter.19.9.5.

[22] E. N. C. Bonifacio, P. M. Zuta, Y. S. González, and P. C. R. Rivas, "Interactive experiential model for the development of digital teaching competence in regular basic education," *Revista Conhecimento Online*, vol. 1, pp. 113–137, Mar. 2024, doi: 10.25112/rco.v1.3507.

[23] N. Vallès-Peris, and M. Domènech, "Digital citizenship at school: Democracy, pragmatism and RRI," *Technology in Society*, vol. 76, Art. no. 102448, Mar. 2024, doi: 10.1016/j.techsoc.2023.102448.

[24] J. Ning, G. Zhi, and Z. Sun, "Research on digital transformation of vocational education in the era of big data," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, pp. 25–40, Jan. 2024, doi: 10.2478/amns-2024-0177.

[25] C. E. Tømte, T. Fossland, P. O. Aamodt, and L. Degn, "Digitalisation in higher education: Mapping institutional approaches for teaching and learning," *Quality in Higher Education*, vol. 25, no. 1, pp. 98–114, May 2019, doi: 10.1080/13538322.2019.1603611.

[26] R. T. Sholi *et al.*, "Application of computer vision and mobile systems in education: A systematic review," *International Journal of Interactive Mobile Technologies*, vol. 18, no. 1, pp. 168–187, Jan. 2024, doi: 10.3991/ijim.v18i01.46483.

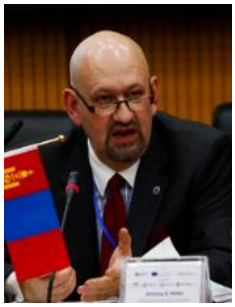
[27] L. D. Parker, J. Guthrie, and A. Martin-Sardesai, "Performance management in the Australian higher education system – A historically informed critique," *Accounting History*, vol. 29, no. 2, pp. 215–235, Feb. 2024, doi: 10.1177/10323732241230348.

[28] A. V. Liezina, K. A. Andriushchenko, O. D. Rozhko, O. I. Datsii, L. O. Mishchenko, and O. O. Cherniaieva, "Resource planning for risk diversification in the formation of a digital twin enterprise," *Accounting*, vol. 6, pp. 1337–1344, Aug. 2020, doi: 10.5267/j.ac.2020.8.016.
[29] U. F. Sahibzada, N. A. Janjua, M. Muavia, and S. Aamir, "Knowledge-oriented leadership and organizational performance: Modelling the mediating role of service innovation, knowledge sharing quality," *Journal of Organizational Effectiveness: People and Performance*, vol. 11, no. 1, pp. 69–89, 2024, doi: 10.1108/JOEPP-10-2022-0296.
[30] P. Lara-Navarra, E. A. Sánchez-Pérez, A. Ferrer-Sapena, and A. Fitó-Bertran, "Singularity in higher education: Methods for detection and classification," *Expert Systems with Applications*, vol. 239, Art. no. 122306, Apr. 2024, doi: 10.1016/j.eswa.2023.122306.
[31] J. Fleissner-Martin, F. X. Bogner, and J. Paul, "Digital vs. analog learning – Two content-similar interventions and learning outcomes," *Forests*, vol. 1, no. 9, p. 1807, Sep. 2023, doi: 10.3390/f14091807.
[32] S. Cook, D. Watson, and R. Webb, "Performance evaluation in teaching: Dissecting student evaluations in higher education," *Studies in Educational Evaluation*, vol. 81, Art. no. 101342, Feb. 2024, doi: 10.1016/j.stueduc.2024.101342.
[33] M. M. Kozyar, S. M. Pasichnyk, M. M. Kopchak, N. S. Burmakina, and T. Suran, "Simulation-Based Learning as an Effective Method of Practical Training of Future Translators," *Journal of Curriculum and Teaching*, vol. 11, no. 1, pp. 298–308, 2022, doi: 10.5430/jct.v11n1p298.
[34] S. Kumar, P. Rao, S. Singhania, S. Verma, and M. Kheterpal, "Will artificial intelligence drive the advancements in higher education? A tri-phased exploration," *Technological Forecasting and Social Change*, vol. 201, Art. no. 123258, Apr. 2024, doi: 10.1016/j.techfore.2024.123258.
[35] A. I. Sagalevich, "Workers' education in economics," *Refractories*, vol. 17, no. 1-2, pp. 76–77, 1976, doi: 10.1007/BF01281721.
[36] Y. Lavrysh, N. Saienko, and A. Kyrychok, "Issues of Educational Technologies and Authenticity Synergy in a Content and Language Integrated Learning Course at Technical University," *International Journal of Emerging Technologies in Learning*, vol. 16, no. 4, pp. 113–128, 2021, doi: 10.3991/ijet.v16i14.21237.
[37] A. Bayanbayeva, D. Makhmadinov, N. Myrzatayev, G. Niyetalina, G. Narbayeva, S. Suleimenova, and B. Altynbassov, "The Transformational Role of Entrepreneurial Universities in Fostering Tourism Sector of Kazakhstan: Legal Documentary Analysis," *Journal of Environmental Management and Tourism*, vol. 14, no. 4, pp. 2046–2055, 2023, doi: 10.14505/jemt.v14.4(68).16.
[38] V. V. Senadheera, T. P. Rupasinghe, and D. S. Ediriweera, "Connective alignment as the educational approach for higher education in the digital age," *Journal of Learning for Development*, vol. 11, no. 1, pp. 172–180, Mar. 2024, doi: 10.56059/jl4d.v11i1.970.

BIOGRAPHIES OF AUTHORS

Kanziya Kabassova is a Master, Lecturer at the Makhambet Utemisov West Kazakhstan University, Uralsk, Republic of Kazakhstan. Her research interests lie in digital technologies in education, innovative teaching methods, and the role of digital competence in education. She can be contacted at email: kanziyakabassova@gmail.com.

Khosbayar Nyamsuren is a Ph.D, researcher at the Otgontenger University, Ulaanbaatar, Mongolia. Her research interests are equity and access in digital education, student experiences with digital learning, and the impact of globalization on higher education practices. She can be contacted at email: k-nyamsuren@hotmail.com.



Antony D. Miller is a Ph.D, associate professor at the Department of University International Relations, Otgontenger University, Ulaanbaatar, Mongolia. His current research interest includes blended learning models, digital literacy programs for students, and innovative curriculum development. He can be contacted at email: A-D-Miller@outlook.com.

Iurii Piven is a Ph.D, assistant at the Department of Surgery No. 3, Poltava State Medical University, Poltava, Ukraine. His research interests focus on the impact of social media on student engagement, online collaboration tools, and challenges in remote learning. He can be contacted at email: iuriipiven@meta.ua.

Yuriy Kravtsov is a full Doctor, Professor at the Department of Sociology, Dniprovsky State Technical University, Kamianske, Ukraine. His research interests include teacher preparedness for digital education, the role of multimedia technologies in learning, and the influence of cultural context on digital education. He can be contacted at email: kravtsov-yuriy@outlook.com.