OPPORTUNITIES AND CHALLENGES FOR USING ARTIFICIAL INTELLIGENCE IN ACADEMIC CONTINUITY: CASE OF GEORGIA

Maia Noniashvili

Business and Technology University, Tbilisi, Georgia

Lela Matchavariani

Business and Technology University, Tbilisi, Georgia

ABSTRACT

This article examined how higher education institutions in the Republic of Georgia responded to the challenges of the COVID-19 pandemic. Focusing on the context of the digital revolution and centering upon the utilization of artificial intelligence (AI), it aimed to discern how these institutions sustained the continuity of the learning process and implemented innovative measures. Based on the research findings, the solutions proposed in this article present AI tools for personalized learning, adaptive assessment, and intelligent tutoring. As institutions navigated the post-pandemic era, the integration of AI into education proved viable. This research provided tangible insights into the digital revolution affecting education and informing strategic decision-making in Georgia's evolving higher education landscape. Recognizing the difficulties caused by the pandemic and the inherent challenges associated with strategic decision-making, a qualitative research approach was used to gain nuanced insights. It relied on in-depth interviews, recognizing the spontaneous and time-sensitive nature of strategic decisions made by universities during the pandemic, often precluding extensive pre-planning. The authors provided critical findings in terms of the pros and cons of distance learning and proposed AI solutions for each challenge that Universities faced during and after this significant disruption, giving real successful examples.

Keywords: EdTech; higher education; academic continuity; artificial Intelligence

INTRODUCTION

The global onset of the COVID-19 pandemic underscored the criticality of academic continuity planning, as educational institutions worldwide were compelled to transition to remote learning and navigate challenges inherent in disruptions to traditional in-person education. A well-designed academic continuity plan facilitates institutions in upholding their commitment to quality education, adapting to evolving circumstances, and addressing the ongoing needs of students. The COVID-19 pandemic has also highlighted the need to understand the key components of a relevant, successful online pedagogy. Using these insights, instructors in the virtual classroom can facilitate and accentuate the knowledge gained by responding to students' emotional needs and perceptions (Kazybayeva et al., 2022).

Contemporary societal existence has had various challenges, marked by unforeseen events that significantly altered established norms. The spread of the coronavirus (COVID-19) pandemic became a prominent exemplar, precipitating a transformative impact on lifestyles, regulatory frameworks, occupational modalities, and educational paradigms. The ensuing alterations revealed both impediments and opportunities, with a pervasive influence extended across many domains. A particularly important consequence was the pervasive impact on the educational milieu, wherein the conventional modes of instruction underwent a radical shift towards remote modalities. This transition, while rendering the learning process more accessible for some, posed challenges for others.

The concept of academic continuity (AC) refers to the capacity of educational institutions to sustain their fundamental functions and services in the face of disruptive events or challenges (Hescock J., Laford R., 2014). Such disruptions may take various forms, encompassing natural disasters, public health emergencies (e.g., COVID-19), technological malfunctions, conflicts (war in Ukraine, Israel), or other unforeseen circumstances that have the potential to disturb the routine operations of an educational institution. The main components of academic continuity planning encompass all facets associated with the learning process: resource allocation, communication, assessment and grading, student support, faculty preparedness, record management, collaboration, and legal and regulatory compliance, among others (Hescock J., Laford R., 2014).

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to mimic human cognitive functions such as learning, problem-solving, and decision-making. AI encompasses various subfields, such as machine learning, natural language processing, computer vision, and robotics. One comprehensive definition of AI is provided by Russell and Norvig (2016), who describe AI as "the study of agents that receive percepts from the environment and perform actions" (p. 2). They further elaborate on the ability of AI agents to "perceive their environment, persist over time, adapt to change, create and pursue goals, and interact with other agents and people."

Broadly, artificial intelligence (AI) can serve as an ally in education. Its algorithms can process extensive datasets, analyze intricate data sets, and discern correlations to expedite the research process, making simple data analysis and pattern identification. AI algorithms rooted in deep learning also possess the ability to analyze and interpret visual data, finding applications in diverse fields such as medicine, astronomy, and environmental studies. Artificial intelligence emerges as a precious solution for creating virtual laboratories and simulations, making the simulation of complex phenomena in controlled environments happen. This not only reduces costs, risks, and time associated with experiments conducted in a physical environment but also finds relevance in predictive analytics and modeling within climate research, economic analysis, and healthcare (Miao et al., 2021).

AI's application in academic continuity covers various domains: Online Learning and Education: AI can analyze students' learning behaviors and habits and tailor educational content to their individual needs, pacing, and preferences. AI can automate grading systems, saving educators time by evaluating assignments, quizzes, and exams automatically. Virtual classrooms can manage real-time language translation, facial recognition for engagement tracking, and sentiment analysis to gauge student emotions. Miao and his colleagues provide comprehensive guidance for policymakers on the integration of AI in education in their article. They discuss the potential applications of AI in enhancing teaching and learning processes, including personalized learning, automated grading systems, and virtual classrooms. Siemens and Baker, in 2012, explored the intersection of learning analytics, educational data mining, and AI in education. They discuss how AI algorithms can analyze extensive datasets to provide insights into student's learning behaviors and preferences, thus enabling personalized learning experiences and improving academic continuity. Intelligent tutoring systems in teaching and learning contexts were mentioned by Lane and VanLehn in 2005. They highlighted how AI could facilitate adaptive instruction, automate assessment processes, and provide real-time feedback to students, thus contributing to academic continuity in educational settings.

The difficulties imposed by the COVID-19 pandemic have indeed accelerated the digitization of educational practices worldwide. Prior to the widespread impact of the pandemic, many educational institutions, including those in Georgia, lacked explicit legislation permitting Higher Education Institutions (HEIs) to administer educational programs remotely. This legislative gap contributed to a lack of experiential precedent for remote learning within the Georgian educational landscape (Khvedelidze et al., 2021). According to a study by Gavrikov et al. (2021), the absence of clear regulations regarding remote education in Georgia posed significant challenges for HEIs during the pandemic, necessitating rapid adaptation to remote and hybrid learning methodologies. The implementation of remote and hybrid learning methods presented a multitude of challenges for Georgian HEIs. These challenges encompassed various aspects, including the preservation of educational quality, student monitoring, adherence to academic ethics, and maintaining integrity standards. Research by Mdivnishvili et al. (2020) highlights the difficulties encountered by educational institutions in ensuring the quality and integrity of remote learning experiences amidst the pandemic-induced transition.

The purpose of this article was to explore the potential applications of artificial intelligence (AI) in this process (AC) and delineate guidelines tailored for higher education institutions in the country of Georgia.

LITERATURE REVIEW

Artificial Intelligence (AI) has emerged as a promising tool for addressing challenges in education, presenting opportunities for innovation in teaching and learning practices (Zhang et al., 2020). As the world navigates the complexities of education in the 21st century, AI implementation has become a focal point for educators, policymakers, and researchers. In our literature review, we explore key themes related to the potential, challenges, and impacts of AI on education, drawing insights from recent publications.

Some Georgian authors, even before COVID-19, argued that AI usage as a teaching instrument would enhance education quality and emphasize an individual approach to teaching and learning by creating a 24/7 opportunity for learning made available for student assistants using a virtual space. They mentioned that AI directly linked science with the factors used to facilitate the growth of Georgia's economy (Noniashvili et al., 2020).

The intersection of AI and education is not a new phenomenon, as evidenced by works such as Aleven and Koedinger (2002). However, recent advancements, including the availability of datasets and enhanced computational efficiency, have provided greater opportunities for leveraging AI in education (Romero & Ventura, 2010; Koedinger et al., 2015). The literature emphasizes the need to address longstanding philosophical and ethical questions that arise at this intersection.

The potential of AI to respond to significant challenges in education is a recurring theme in recent literature as well. Authors such as Miao (2023) argue that AI, under the umbrella term covering various methods, can contribute to Sustainable Development Goal 4 (SDG 4). However, these opportunities come with some risks and challenges, often outpacing policy debates and regulatory frameworks (Miao et al., 2023). The need for research and evaluation before assuming AI as a panacea for educational issues, especially those exacerbated by the pandemic, is highlighted (Miao et al., 2023).

A critical aspect given in the literature is the necessity for collaboration between AI researchers, engineers, and educationalists (Gillian et al. 2020), stressing the importance of good understanding between these communities. While AI experts must engage with the theory and practice of education, educationalists are encouraged to delve into the technical aspects of AI to speed up effective collaboration. The overarching goal is to strike a balance between technological innovation and educational efficacy. In today's higher education landscape, the focus on personalized teaching is prominent (Means, B., & Neisler, J., 2020).

The literature suggests that AI technologies, such as adaptive learning algorithms, play an important role in skills-building and data analysis (Dietterich, 2015). Many prominent universities have implemented AI tools, demonstrating the potential for effective grading, feedback mechanisms, and integration into various industries (Kotsiantis, S. B., 2013). Technological advancements, including AI, have triggered innovative changes in teaching

methodologies (Siemens, G., & Long, P., 2011). Higher educational institutions are adapting curricula for digital technologies, and social media, as one of the online means, is playing a central role in the process (Greenhow, C., & Gleason, B., 2014). Students can share knowledge through these platforms, and educators leverage social media to announce online courses and training opportunities and also communicate with their students and colleagues. The literature suggests that the COVID-19 pandemic has strengthened the role and relevance of digital media in education (Hodges et al., 2020). The impact of social networking on online education is seen as increasingly important in the rapidly evolving landscape of digital technology (Junco, R., Heiberger, G., & Loken, E., 2011).

As reflected above, AI's integration into education holds significant promise, but it necessitates careful consideration, collaboration, and ongoing research, especially in managing academic continuity. The intersection of AI and education is a dynamic space, requiring a delicate balance between technological advancements and the core principles of effective pedagogy. Scholars, educators, and policymakers continue to engage in multidisciplinary conversations to harness the full potential of AI in shaping the future of education.

RESEARCH METHODOLOGY AND RESULTS

The primary objective of the research was to assess the adaptability of strategies employed by higher education institutions during the COVID-19 pandemic within the context of the digital revolution, with a specific focus on the utilization of artificial intelligence (AI). Our research sought to illuminate the exigencies and challenges encountered by higher education institutions in Georgia during the circumstances of the COVID-19 pandemic. We aimed to discern how these institutions sustained the continuity of the learning process and implemented innovative measures. Our interest extended to gauging students' perceptions of their respective universities' responses to this significant disruption.

Central to our research was identifying the measures undertaken by universities to enhance the overall learning experience and improve learning outcomes for students. In pursuit of our aim, we formulated the following specific tasks.

Table 1: Assessment of COVID-19 Impact on Academic Activities and Strategies Employed by Universities

Task	Description
Impact of COVID-19 on Academic Activities	Analysis of COVID-19 repercussions on academic endeavors within higher education institutions.
Evaluation of Strategies Employed by Universities and Reception	Examination of universities' strategies during the pandemic and students' feedback on these strategies.
Priorities in Investments Based on Digitization Trends	Identification of main investment priorities for universities, focusing on digitization trends.
AI Usage in Academic Continuity in Georgian Universities	Exploration of barriers and opportunities for AI integration in ensuring academic continuity.

By systematically addressing the tasks, the research aimed to contribute valuable insights into the dynamics of higher education institutions' response to the challenges posed by the pandemic, with a nuanced exploration of the role played by AI and digitization in shaping strategies and results.

Recognizing the difficulties caused by the pandemic and the inherent challenges associated with strategic decision-making, a qualitative research approach was developed to gain

insights. In particular, the research methodology relied on in-depth interviews, recognizing the spontaneous and time-sensitive nature of strategic decisions made by universities during the pandemic, often precluding extensive pre-planning and Key Performance Indicator (KPI) establishment. Primary data was received directly from respondents in a semi-naturalistic state, emphasizing the authenticity of information.

Non-probability sampling was employed to select respondents, adopting a purposive strategy to ensure representation from distinct levels within universities. Specifically, each university contributed the perspectives of two students from both bachelor's and master's levels one representative from top management as well. The snowball sampling technique facilitated the identification of suitable participants, capitalizing on referrals from initial interviewees.

The non-probability sampling for the study was chosen due to the research focus on capturing insights from a diverse range of students from both bachelor's and master's levels across various departments and universities, as well as one representative from top management. Given the intricate nature of accessing such a specific population, a non-probability sampling technique was deemed most appropriate. Specifically, the snowball sampling principle was utilized, wherein initial participants were identified through personal networks, including relatives and acquaintances within the researcher's sphere. This methodological choice facilitated the recruitment of participants who met the desired criteria, allowing for a purposive selection process that prioritized depth and diversity of perspectives over randomization. Moreover, employing a non-probability sampling strategy acknowledges the inherent challenges in accessing and recruiting a highly specific and dispersed population while still enabling the study to glean valuable insights pertinent to the research objectives and capitalizing on referrals from initial interviewees.

Active status during the pandemic period (2019-2021) was a prerequisite for student interviewees, ensuring their firsthand experience and ability to assess implemented changes and compare it to the pre-Covid time. A total of 52 in-depth interviews were conducted,

encompassing insights from 42 students and 10 different university representatives. This comprehensive approach allowed us to thoroughly explore the strategic decisions made by 10 distinct universities during the pandemic.

The interview sessions, averaging 40 minutes each, adhered to a structured questionnaire that turned into a semi-structured format through modifications prompted by dynamic discussions. This adaptive methodology facilitated a deep understanding of the numerous challenges and responses encountered by higher education institutions during the extraordinary circumstances of the pandemic. The research design aimed to capture the richness of perspectives from diverse stakeholders, illuminating the strategies adopted, their implementation, and the consecutive impact on the learning environment and students' learning outcomes.

The survey also focused on the field of medicine, given its unique privilege to conduct in-person study processes during the pandemic in Georgia. This deliberate choice aimed to investigate the extent and nature of modifications made to the existing strategies within this specific academic domain. The predetermined structure of the target groups was established to facilitate a focused and tailored exploration of strategic adjustments within the medical field during the pandemic. This methodological decision allowed for a thorough examination of the distinctive challenges and adaptations encountered by medical education institutions, shedding light on the dynamic interplay between sector-specific regulations and strategic responses. Moreover, the students of practical medicine, natural sciences, and engineering faculties were singled out as separate cases due to their exclusive right to carry out the training process on-site. This separation was motivated by the interest in understanding the extent of modifications required in the existing strategy within these faculties and how such strategies were adapted, if necessary, to meet the challenges posed by the pandemic. By separating the medical field in our survey, we sought to capture the specialized considerations and distinctive characteristics shaping the strategic decisions made by institutions vested with the authority to conduct on-site educational activities.

Table 2: Universities and programs of the student respondents participating in the research

University	Level	Faculty	Number of students
Free university	Bachelor	Law Program	2
	Master	International relations	2
University of Georgia	Bachelor	Business Administration	2
	Master	Law Program	2
Agricultural University of Georgia	Bachelor	Natural Sciences - Winemaking Viticulture	2
	Master	Business Administration	2
Ilia state university	Bachelor	Film studies	2
	Master	Faculty of Sciences and Arts	2
International Black Sea University	Bachelor	Business Administration - Finance	2
	Master	Information technologies	2
Tbilisi state university	Bachelor	Psychology and Educational Sciences	2
	Master	Social and political sciences	2
Business and Technology University	Bachelor	Business Administration - Finance	4
	Master	Business Administration	2
San Diego State University	Bachelor	Information technologies	2
Tbilisi State Medical University	Bachelor	Physical medicine and rehabilitation	3
	Master	Physical medicine and rehabilitation	3
Georgian Technical University	Bachelor	Faculty of Construction	2
	Master	Faculty of Chemical Technology and Metallurgy	2

Representatives of the top management were interviewed from the selected universities.

Table 3: Universities and Faculty representatives participating in the research

University	Faculty representatives	Number of Representatives
Free university	Lead of English faculty	1
University of Georgia	Business	1
Agricultural University of Georgia	Business	1
Ilia state university	Faculty of Sciences and Arts	1
International Black Sea University	Library	1
Tbilisi state university	Finance	1
Business and Technology University	Management	1
San Diego State University	Information technologies	1
Tbilisi State Medical University	Faculty of Physical medicine and rehabilitation	1
Georgian Technical University	Faculty of Construction	1

Table 4: In-depth Interview Questions

Board Members and Top Managers	Students
In general, how much has the pandemic affected you? How prepared are you? What hindered you in your daily university life?	In general, how much has the pandemic affected you? What hindered you in your daily university life? What has been the biggest problem/s you have faced in maintaining your continuing education at this point? How did you solve these problems?
What was/were the biggest problem/s that have arisen at this stage, and how was/were it/they mobilized? Did you have to make cuts or additions? Who was involved in these decisions and why? How do you manage crises and teams?	How did the government help you to solve problems?
How has the government helped you to deal with these challenges?	Was it necessary to provide equipment and training? How did the university allocate the available resources, and how did they help you in this regard?
What strategy did you use to maintain the continuity and quality of education? Were external forces necessary for this? Were internal resources sufficient? If internal resources sufficed, how and why?	Based on the health and safety of students and lecturers, was the learning process fully remote, or was the a need to report to the site as well? How did the university deal with existing restrictions? Were the lectures/exams online only or in a hybrid format?
How did the employees meet the new solutions? How about the students?	How did the university encourage you? Did It provide career support? How often were the surveys conducted? Did the university consider your opinion, and how?
What problems did the students face during this period in the direction of continuity of study and maintaining quality? How did you solve these problems?	How has the pandemic affected your studies and financial resources? How did you manage to deal with it? Did you take advantage of the mobility or how did the university manage the processes in terms of exchange programs?
Was it necessary to provide equipment and conduct training for employees or students? How were the available resources allocated?	What acquisitions were required to maintain online learning - did the university fill in the gaps in the resources you needed? E.g., purchase of video cameras for hybrid lectures, provision of computers…? Were e-books delivered on time? Was email easily accessible before or during the pandemic? How easy was it to cooperate with the university and get help?
Based on the health and safety of the staff, was the work completely remote, or was in-person attendance required? How did you stay within the existing restrictions?	How did you and other students meet the university's new decisions? How would you rate the university's actions, positively or negatively, and why?
Were the lectures/exams conducted online only or in a hybrid format?	In your opinion, did the acceleration of the digital revolution start because of COVID-19? Were the government restrictions right? How did the quarantine affect your academic performance or work compared to previous years?

Table 4: Continued

How were students and staff motivated during this period? How has learning design changed? How were career advancement opportunities promoted?	What challenges and benefits did online education bring you as a student and as a person? From this perspective, has the pandemic reduced or increased your capacity and flexibility? Will you welcome learning methods used during the pandemic in the future? If yes, which ones and why? If not, why not?
What effect did all this have on financial resources? To what extent was financial sustainability ensured? How did you manage to attract investments? What happened to student mobility? How did exchange programs go?	-
What purchases were needed to maintain online learning - purchase of platforms, Meet, Zoom, and video cameras for hybrid lectures? What criteria guided these purchases? Were there adequate e-books initially available? How easy was it to collaborate with other universities during this time? Was it necessary to find and involve business partners?	-
Has the acceleration of the digital revolution started because of COVID-19? Were the government restrictions right? What were the outcomes of the quarantine in terms of academic performance compared to previous years? Is online learning the future?	-
What challenges has online education brought to you, and what are the benefits for both the university and the students? From this perspective, has the pandemic reduced or increased the number of students at your university? Is it easier to attract them?	-

While the research endeavor provided valuable insights, it is crucial to acknowledge certain limitations in the methodology and implementation. Firstly, the reliance on individual responses from students may not fully encapsulate the comprehensive landscape of institutional reactions to the pandemic. Student perspectives, while informative, offer a subjective lens and may not provide an exhaustive representation of the institutional dynamics.

Additionally, the practical constraints of time and resources restricted the scope of the survey, causing a fully comprehensive examination of all higher education institutions. The necessity for expediency and resource optimization led to a sampling strategy rather than an exhaustive study, potentially to some extent limiting the generalizability of findings.

Despite these limitations, the research methodology and sample size were deemed adequate for forming a conceptual understanding of how higher education institutions in the medical and other fields responded to the challenges posed by the pandemic.

Based on the research outcomes, each university effectively sustained an uninterrupted educational continuum. Notably, some institutions initiated their preparatory measures proactively, while others commenced such initiatives subsequently. These procedural endeavors collectively facilitated the continuation of academic pursuits for their respective student bodies in a remote learning environment.

Throughout the survey, both stakeholders, namely the academic institutions and the

students, realized the multifaceted impact of the pandemic. Noteworthy were the discernible positive and negative dimensions that emerged. Besides the challenges, there was a recognition of newfound opportunities, judicious time and fiscal savings, the cultivation of innovative insights, heightened adaptability, and the acquisition of digital proficiencies. We must mention that the latter skillset continued to be applied even after the cessation of the pandemic.

Table 5: Research findings – pros and cons of distance learning

Pros	Cons
Attending a lecture at work	Lack of social relationships
Passing the exam easily	Difficulty in understanding new topics.
Less stress	Lack of concentration
Time saved – no traffic jam.	Internet failure
Less expenses - food, transport, utilities, rent.	Lack of equipment
Reduction of regulations	Deterioration of mental health
Psychological help	Forced vaccination.
Continuity of learning	Non-concessional - fees, equipment, Zoom package.
Benefits (distribution of tuition fees, assistance with equipment…)	Writing the exam with masks
Use and utilization of Zoom, Google Meet, and Teams.	Direct online learning – inexperienced people
Survey, career promotion.	Getting to the exam - going from city to city for a week
Starting an online job – income increase	Postponement of exchange programs
More e-books	Quality of education - less knowledge
Benefits for Highland students	Absence of graduation events
Flexibility	Curfew
New opportunities – online, hybrid learning	Medicine at a distance
Making lecture video recordings	Obligation to purchase non-digital books.
Ability to gain more knowledge from one space.	Lack of technical skills of elderly lecturers
Use of Plagiarism Systems	Simultaneous inclusion of online and offline students in the lecture during hybrid lectures
New staff	Decreased academic performance due to recording lectures.
Open access to services for free - use of Elsevier databases outside the university	Maintenance of justice
Reduced mobility to other universities	-
Online education courses at a low price	-
Accelerating the digital revolution	-

Table 6: Research findings and AI solutions

#	Key Finding	Solution	AI Tool for Solution
1	Limited Preparedness for Unpredicted Changes and Digitization: Despite many universities successfully maintaining academic continuity, our investigation revealed an overall lack of readiness within the education system for abrupt transitions and the swift integration of digitization	Facilitating an online or hybrid learning modality contingent upon the distinctive characteristics of each academic department is imperative. The burgeoning demand for remote learning across various courses is evident and is anticipated to escalate in the near future, thereby establishing itself as an indispensable facet of contemporary existence.	Learning and teaching based on artificial intelligence - intelligent tutoring systems (ITS) (Gillani et al., 2023). AI in Online and Blended Learning Environments - Personalized Learning Paths, Collaborative Learning with Artificial Intelligence Mediated Group Interaction, and Virtual and Augmented Reality in Education
			Using artificial intelligence-driven Learning Management Systems (LMS) to deliver a customized educational experience for students as a strategic initiative. Deploying adaptive learning algorithms enables the provision of tailored instruction and assistance, aligning with the strengths and weaknesses of each student in a distance learning environment.
			Using AI Collaborative Tools: Technological solutions, such as online discussion forums, wikis, and social media platforms, facilitate effective collaboration and communication between students and lecturers, eliminating physical campus constraints.
2	AI's Augmentative Role in Educational System: The study underscored that while Artificial Intelligence (AI) exhibits substantial potential, it cannot replace the roles of either professors or researchers. However, it was observed to markedly enhance the quality and efficiency of educational, teaching, and research processes when employed as a supplementary tool.		
3	Relevance Challenges in Online Learning: Distance learning was found to be incongruent for fields such as practical medicine, natural sciences, and engineering because of their inherent specificity.	Soon, it is imperative to draw upon international exemplars and exchange experiences, particularly through the provision of distance learning opportunities tailored for faculties in this domain. Furthermore, the use of innovative methodologies, informed by regular student surveys, is essential to craft a distinctive pedagogical approach harmonized with the exigencies of the field of study.	The escalating implementation of Virtual and Augmented Reality (VR and AR) technologies in educational settings signifies a rising trend. These technologies are used to provide immersive learning experiences, simulate real-world scenarios, and enhance remote collaboration and communication. Additionally, they contribute to risk mitigation associated with physical environments.

Table 6: Continued

4	Technical Proficiency Gaps among Lecturers: A lack of technical skills among lecturers was identified, prompting students to help and consequently consuming a considerable portion of lecture time.	It is imperative to train academic staff, enhance their technological skills, and encourage them to prioritize additional training. Another essential change for digitizing universities and maintaining competitiveness is the integration of assistant systems.	Intelligent Tutoring Systems (ITS): The University of Michigan was first to introduce Auto Tutor, an advanced AI-driven tutoring system. This system provides tailored assistance and guidance in the domains of reading and writing comprehension, exemplifying a cutting-edge approach to individual academic support for students.
5	Insufficient Online and Digital Resources: The pandemic exposed a deficiency in digital resources, leading to limited student access to digital materials, thereby hindering the learning process.	Universities require library services and digital book access. Mobilizing resources to offer students convenience and remote access to learning materials is crucial in the context of the ongoing digital revolution and the digitization of electronic resources.	Content analysis: AI has the capability to analyze online resources, extracting valuable insights and metadata. For instance, artificial intelligence algorithms can automatically tag resources with relevant keywords, categorize content by topic or difficulty level, and evaluate the quality and credibility of online sources.
			Enhancing User Engagement Through Gamification (Nguwi Y.Y "Technologies for Education: From Gamification to AI-enabled Learning," 2023): Artificial Intelligence (AI) possesses the capacity to elevate user engagement within online resources by incorporating gamification elements in it. Through the analysis of student behavior, AI algorithms can dynamically present personalized challenges, badges, leaderboards, or rewards. This approach not only motivates learners but also brings a more interactive and enjoyable learning experience.
6	Academic Integrity: Issues of academic integrity were brought to the forefront during the pandemic, warranting attention and intervention.	Integrating and implementing strategies derived from qualitative research can be beneficial for all universities. To uphold ethical standards in academic papers, it is essential to incorporate plagiarism detection systems in distance learning. Additionally, employing oral surveys, camera monitoring, and setting clear assignment deadlines further contribute to maintaining academic integrity.	Utilizing Artificial Intelligence in Assessment Tools: The integration of artificial intelligence (AI) in assessment tools is a paradigm shift in evaluating students' knowledge and skills. Leveraging adaptive diagnostic grading enables the identification of specific strengths and weaknesses in individual domains. Machine learning (ML) algorithms are then employed to scrutinize student data, enabling the provision of targeted feedback and support, thereby enhancing the precision and efficacy of the whole process.
			Intelligent Assessment: Edmentum, a leading educational technology company, has introduced an AI-powered assessment instrument named Precise Path. This tool uses adaptive diagnostic

Table 6: Continued

			assessments to evaluate students' knowledge and skills, subsequently offering interventions to facilitate and improve their learning progression. The integration of artificial intelligence in the assessment process exemplifies a contemporary approach to personalized educational support.
			Gradescope: the latest AI-powered grading platform, which employs computer vision and machine learning to automate the grading process and furnish feedback on diverse assignment formats. Its abilities extend to assessing handwritten responses, multiple-choice questions, and programming assignments, showing the versatility of artificial intelligence in streamlining and enhancing the grading of academic work.
7	Unequal Treatment of Students: The research shed light on instances of unequal treatment towards students, revealing disparities in approaches within the academic landscape.	Individual, personalized approach	Personalized Learning: The introduction of artificial intelligence (AI) into learning management systems (LMS) offers a transformative opportunity for providing students with a personalized learning experience fit to their individual needs, preferences, and learning styles. This proactive approach ensures that students can maintain effective learning trajectories even in the face of sudden disruptions.
			Arizona State University's Innovative platform: Noteworthy among educational advancements is Arizona State University's introduction of the AI-powered adaptive learning platform Smart Sparrow. This platform is designed to deliver personalized learning experiences across various subjects. Employing machine learning algorithms, Smart Sparrow analyzes student data with precision, offering personalized feedback and assistance to enhance the educational journey for each student.

Ultimately, all respondents demonstrated proficiency in acquiring new digital skills during the pandemic. These newfound competencies are anticipated to be instrumental in their future endeavors, fostering agility and efficiency through the judicious use of technology. Nearly all respondents expressed a willingness to engage in remote short courses in the future.

However, the prospect of online learning in subsequent periods remains vague. University representatives and the extant Georgian legislation currently prohibit the provision of online courses by educational institutions, even in the post-pandemic era. This regulatory stance poses a potential hindrance to the sustained integration of online learning methodologies

into educational processes.

CONCLUSION AND RECOMMENDATIONS

The dynamic landscape of modern society, marked by unexpected events and transformative shifts, was notably exemplified by the global spread of the COVID-19 pandemic. This unprecedented challenge forced a deep reevaluation of established norms across various domains, including education. The subsequent rapid shift to distance learning underscored both the adaptability and vulnerabilities of educational systems worldwide.

In the context of higher education in the Country of Georgia, the absence of pre-existing legislation permitting remote education posed a unique challenge. The pandemic compelled institutions to navigate uncharted territory, prompting a swift digitization of educational practices. This article delves into the multifaceted response of higher education institutions in Georgia, emphasizing the integration of artificial intelligence (AI) as a significant component in the pursuit of academic continuity.

The exploration of academic continuity strategic planning highlighted the critical role played by components:

- learning processes
- resource allocation
- communication
- Assessment
- regulatory compliance.

The global crisis brought a reevaluation of pedagogical approaches, necessitating the integration of technologies such as AI to ensure the seamless continuation of educational processes. The integration of AI emerged as a transformative, powerful tool, offering solutions across diverse domains for academic continuity:

- distance learning
- research
- administrative support
- remote collaboration
- assessment
- feedback.

The research findings underscored both the challenges and opportunities faced during the transition to remote learning. Of great significance was the recognition of AI as an augmentative tool rather than a replacement for traditional roles in education. The challenges in certain fields, technical proficiency gaps among lecturers, and issues of academic integrity were identified as areas necessitating strategic interventions.

The solutions proposed by us for identified challenges incorporate AI tools:

- personalized learning experiences
- adaptive assessment systems
- and intelligent tutoring

Virtual and augmented reality technologies were brought to the forefront of specific fields like medicine, addressing the relevant challenges posed by remote learning in practical disciplines.

As institutions grapple with the aftermath of the pandemic, the implementation of AI into educational practices stands as a promising avenue. However, proper attention must be paid to ethical considerations and the need for equitable access when implementing AI solutions. The research provides valuable insights into the intricacies of the digital revolution in education, offering a foundation for future exploration and strategic decision-making in the fast-developing landscape of higher education.

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ABOUT THE AUTHORS

Maia Noniashvili email: maia.noniashvili@btu.edu.ge (Corresponding author)

Maia Noniashvili, PhD, Professor in Management. She is the Chancellor of Business and Technology University, Tbilisi, Georgia, and acts as an operations manager at Webster University Campus in Georgia. During 15 years of her professional corporate and academic work in higher education, she has authored ten publications. Her research interests are in EdTech, education digitalization, and quality enhancement. She is head of the Master's Program in Business Administration and Modern Technologies.

Lela Matchavariani holds an MBA and is the Chief Operations Manager at K Group in Tbilisi, Georgia, as well as a training manager at Electronic Academy. Her practical and academic work is related to business and learning activities. Her research interest is in studying the use of AI tools in learning and working and other fields connected to education and job environment digitalization.