

Beyond Traditional Learning: Embracing Digital Transformation and Tackling ChatGPT Concerns

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ABSTRACT

This article advocates for the widespread adoption of digital technologies as the primary method of teaching and learning in higher education institutions. It emphasizes the importance of this transition for several reasons, including the improvement of student retention and the enhancement of educational effectiveness. There is ample evidence to support the notion that digital transformation has greatly increased efficiency, customer relationships, and overall competitiveness in the business sector. However, colleges and universities in the United States have yet to fully embrace digital transformation technologies to enhance teaching and learning for their large student populations. By incorporating innovative technologies like simulation and virtual reality, higher education can significantly enhance the learning experience for students and improve the teaching capabilities of faculty members. Educational institutions can also strategically integrate AI-enabled technologies such as ChatGPT into their programs to provide great benefits to students. This approach aligns with the engagement theory, which promotes educational excellence, innovation, and national progress.

Keywords: digitization, digital transformation, engagement theory, education, ChatGPT

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INTRODUCTION

In its white paper titled "Data Age 2025," the International Data Corporation (IDC, 2018) emphasizes the profound importance of digitization on a global scale. According to IDC, humanity is currently engaged in a momentous endeavor to digitize the world. This process encompasses every aspect of our business workflows and personal lives, as we strive to integrate digital technologies into every intersection of our existence. Indeed, the remarkable progress in Artificial Intelligence (AI) has facilitated the emergence of numerous digital technologies, platforms, systems, and products. These advancements include Internet of Things, cloud computing, machine learning, 3D printing, and cyber security. Consequently, these technologies have greatly assisted businesses across various sectors and industries in enhancing their efficiency, competitiveness, and customer-centric approach.

Scholars and professionals have shown a strong interest in the growth and impact of digitization and digital transformation. They recognize the economic and social significance of innovation and new technologies in society. For instance, Syed Hammad and AL-Ahmari's 2019 study explored the complexities surrounding reverse engineering and digitization. The authors highlighted the crucial role played by the manufacturing sector in the national economy and how reverse engineering has become essential to its operations due to its versatile applications.

The quality of reverse engineering products, as emphasized by the authors, heavily relies on the quality of digitization. Various digitization devices are available, each differing in cost, accuracy, ease of use, accessibility, scanning time, and other factors. Therefore, selecting an appropriate device is vital when undertaking a specific reverse engineering project. Lorenz, Rafael, and others (2020) pointed out that manufacturers are actively pursuing innovation and process enhancement through the adoption of emerging digital technologies. However, valuable insights and information about these new technologies often exist beyond the boundaries of a company's organization.

In their 2022 study, Zahariev et al. highlighted the ongoing impact of digitization on business firms, noting consistent changes in their activities and processes. This necessitates a fresh managerial perspective to enhance competitiveness in today's rapidly changing and unpredictable business landscape. However, this transformation also presents opportunities for firms to explore new avenues for expanding their market reach, even in distant regions, while optimizing supply chains and reducing overall costs.

Horvathova and Mokrisova (2022) emphasized the transformative impact of the digital era in the 21st century. This era has introduced numerous technologies, innovations, and trends that have significantly influenced various aspects of life. Digitalization has led to increased reliance on digital tools in personal, public, and business spheres. Embracing digitalization has become essential for businesses as it drives economic growth and enhances overall performance.

According to Herve et al. (2020), the connection between digitization and international business success becomes evident as organizations embrace digital transformation in their operational processes. The extent to which a business adopts digitization directly correlates with the effectiveness of its strategic decisions in international markets. In other words, advancing digital initiatives increases the chances of achieving success in global markets through well-informed and successful strategic choices.

In a 2022 study by Soukaina and Khalid, the adoption of digitization among entrepreneurs in developing countries and its effects on reducing poverty were investigated. The findings indicated that digitization has the potential to contribute to poverty alleviation in these nations.

Rajahonka and Villman (2019) conducted a study on the utilization of digitization by women entrepreneurs and discovered that women face specific obstacles due to traditional reservations in adopting technology. While technology application can enhance their well-being in the workplace and contribute to their pursuit of equality, women require assistance in identifying and navigating digital career paths.

In a study conducted by de Silva et al. (2023), the researchers investigated the effects of digital transformation on accounting work processes. They found that technology plays a significant role in automating tasks such as document classification and posting, digital archiving, and facilitating communication with clients. Finally, Mohamed Hashim et al (2022) argue that the survival of higher education institutions depends on their ability to adopt digital transformation

IMPACT OF DIGITIZATION AND DIGITAL TRANSFORMATION

Digitization and digital transformation have a significant impact on the productivity and organizational performance of both businesses and governmental agencies. Digital transformation involves leveraging digital technologies to improve the production and delivery processes of products and services, resulting in cost reduction and quality enhancement. Additionally, the digital transformation of economic sectors and industries has the potential to boost national productivity, output, and income.

As the economy expands, the implementation of digitization and digital technologies will lead to the emergence of new business firms and industries, thereby creating additional employment opportunities. The adoption of E-commerce, cloud computing, and other innovative business models is expected to drive the growth of international trade, benefiting the participating nations. Furthermore, digitization and digital technologies foster innovation and the introduction of new digital products and services.

Digital technologies play a crucial role in enabling business and other leaders to make data-driven decisions and optimize the allocation of productive resources. They also facilitate the search for and development of technical skills and talents within the workforce. Moreover, AI-enabled digitization technologies promote competition among domestic firms and between domestic and international firms. The landscape of digital transformation technologies is vast and ever-expanding. Experts have classified these technologies into different categories. Table 1 (appendix A) shows some of the most widely used classifications.

DIGITAL TRANSFORMATION IN EDUCATION

According to data provided by the U.S. government (usafacts.org), of the 16.6 million students who began high school in 2010, only 23 percent managed to successfully obtain a four-year college degree by 2020. An additional 27 percent had enrolled in college but were still working towards their degree. It is evident that there are several factors contributing to students not completing their college education, and one significant factor could be their struggle to handle their coursework due to a lack of understanding.

Digital transformation in education, as defined by the United Nations Educational, Scientific, and Cultural Organization (UNESCO), refers to the implementation of inventive digital technologies and platforms. Its purpose is to facilitate novel approaches to teaching and learning, enhance educational procedures and achievements, and expand accessibility to essential learning resources.

Indeed, a promising solution to enhance college students' achievement is the adoption of innovative digital transformation technologies by educational institutions. These technologies offer a range of benefits such as diversity, convenience, efficiency, and effectiveness in instruction, teaching, and learning. In view of the engagement theory, developed by Greg Kearsley and Ben Shneiderman (1998), students should actively participate in meaningful activities by interacting with others and undertaking worthwhile tasks. The theory suggests that technology can play a crucial role in enhancing engagement, enabling unique opportunities that would otherwise be challenging to attain.

In 2020, Bogdandy and colleagues conducted a survey among students at a Hungarian university amidst the Covid-19 pandemic. The aim was to evaluate how students responded to the implementation of digital transformation technologies when the university was temporarily closed. The findings of the study indicated that the experiment was successful, with approximately half of the students expressing their willingness to continue their education with the help of digital technologies.

Higher education institutions across colleges and schools of business, engineering, law, medical, education, arts, and sciences can harness a diverse array of digital technologies. The specific selection of these technologies relies on factors such as the program of study, the institution's financial capacity, and its level of expertise in digital transformation. Table 2 (Appendix) shows the most common technologies.

CHALLENGES IN THE PATH OF DIGITAL TRANSFORMATION¹

Just like in the business world, educational institutions have the chance to greatly benefit from digital transformation. It offers valuable opportunities to enhance their efficiency, effectiveness, student retention, and competitive advantage. Digital transformation entails leveraging digital technologies to improve various aspects of the organization, such as institutional agility, student experience, and overall excellence. However, achieving a comprehensive digital transformation that spans across all the institution's colleges and academic departments is a demanding and time-consuming undertaking. It requires significant financial investment. Throughout this process, several obstacles and challenges arise, which can be categorized as follows (Brunetti et al, 2020; Rana et al, 2020; Cho et al 2021; Aldakheel et al, 2021):

1. **Strategic Challenges:** These challenges primarily revolve around the possible absence of a well-defined transformational plan for the entire institution.
2. **Technological Challenges:** These challenges stem from the scarcity of individuals with the necessary expertise to oversee and manage new AI-enabled educational technologies.
3. **Financial Challenges:** These challenges arise due to insufficient funds to support the digital transformation process. Investing in new technologies, infrastructure, and training can be costly, and many small colleges and universities encounter difficulties in funding such an ambitious program.
4. **Organizational Challenges:** Comprehensive digital transformation often necessitates significant changes in workflows, processes, and roles within the institution.
5. **Human Challenges:** These challenges arise from some faculty, students, and staff members' resistance towards adopting new technologies, which can disrupt the functioning of some academic programs or units. In such cases, a gradual implementation of the transformation process is recommended.

ChatGPT AND EDUCATION

The merit (and demerit) of ChatGPT in education has widely been debated in academic and other circles. For example, amidst a public discourse surrounding the utilization of ChatGPT among students, Criddle and Staton (December 18, 2022) underscored the importance of universities implementing countermeasures against the adoption of artificial intelligence tools such as ChatGPT for tasks like essay writing. The authors emphasized the suggestions put forth by experts in higher education and cognitive science, who proposed the development of inventive assessment approaches to address the potential threats to academic honesty presented by these emerging technologies.

In a piece published in the online edition of the Wall Street Journal, Ricketts and Ravaglia (January 23, 2023) highlighted the concerns surrounding ChatGPT and its potential impact on the future of education. The article revealed that major public-school districts, namely New York and Los Angeles, have taken the step of prohibiting the use of this chatbot on their devices and networks. Their primary worry is that students might exploit its capabilities to engage in academic dishonesty.

According to the authors, despite the current limitations of ChatGPT, it is anticipated that as technology progresses, its influence on education will persist, continuing to disrupt traditional learning methodologies, and that educators should not be afraid of this change, as they consider these technologies to be transformative. They argue that these technologies only pose a threat to the outdated model of education that focuses solely on imparting information and fails to effectively support student success.

In their 2023 publication, Stadler and Reeves highlighted the considerable enthusiasm surrounding the potential of large language models. However, after the introduction of ChatGPT 4, a letter was signed by numerous artificial intelligence experts, urging a temporary halt in the advancement of more potent AI systems. On the other hand, Zamfiroiu et al (2023) believe that the impact of ChatGPT on technology development is enormous.

CONCLUSION

The surge in digital transformation has gained significant momentum, particularly since the emergence of the Covid-19 pandemic in 2019, prompting numerous businesses to increasingly adopt it. Research indicates that digital transformation in education offers several advantages, summarized as follows: Improved learning outcomes through increased student engagement, interactive learning experiences, effective monitoring, and enhanced performance. Additionally, it provides learning flexibility and fosters student collaboration through various academic activities.

It is challenging, if not outright impossible, to separate academic learning and teaching from AI-enabled technologies. Technology and education serve as the two fundamental pillars of innovation, competitiveness, and national economic progress. In this regard, faculty members have the opportunity to cleverly integrate ChatGPT into student assignments, encouraging them to research and verify information for various course tasks, including class presentations, case analyses, and lab experiments.

However, it is crucial to establish a reliable system for authenticating student assignments, such as research papers and examinations, to mitigate the potential risks of student plagiarism and other unethical academic practices. As a personal assistant, ChatGPT can play a valuable role in assisting students in enhancing their creativity and productivity.

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APPENDIX

Table 1
Broad classification of digital transformation technologies

<i>Classification 1</i>	<i>Classification 2</i>	<i>Classification 3</i>
AI	Communication technologies	Electronics technologies
Robotics	Information technologies	Interfaces technologies
Cloud computing	Entertainment technologies	Digital workplace technologies
Networking	Education technologies	Digital real estate technologies
Information technologies	Healthcare technologies	Digital finance technologies
Digital marketing	Manufacturing technologies	Digital health technologies
Communication technologies	Transportation technologies	-
E-commerce	-	-

Sources: various publications.

Table 2
Selected Digital transformation technologies in education

AI applications (e.g., ChatGPT)	Data analytics	Virtual reality (VR)	Cloud computing	Smart video camera
Internet of Things (IoT)	Smart classes	Blockchain technology	Simulation	Online textbooks
Augmented reality (AR)	Learning management systems (LMS)	Smart phones, Tablets, computers, and the like	Video conference platform	Software (e.g., project management)

Sources: Various publications.