Revolutionising Higher Education: The Role of Digital Transformation in Accounting Education

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Abstract

The future of work has arrived: The digital age disrupted higher education institutions at home and abroad, and COVID-19 served as an accelerator. While many higher education institutions across the globe have experienced a return to campus, the concept of channelling education content across digital platforms and digitally enabling the learning experience is here to stay. Higher education is undergoing significant transformations, which are driven by a variety of innovative trends and technologies. These changes are making higher education more inclusive, flexible and aligned with the needs of the modern workforce. This research conducted a thorough review and investigation of the evolution of higher education in relation to the integration of digital tools and technologies in accounting education, and the directions digital transformation can take in accounting education in the future. The research used literature review as method to explore the literature and research findings about digital transformation in accounting education. The analysis is supported by a comprehensive review of relevant literature on the strategies that are shaping the evolution of higher education and the integration of digital tools and technologies in accounting education. The results point to a transformative effect of digital technologies on accounting education at higher institutions. Digital technologies can improve the personalisation of learning by providing tailored activities beyond traditional strategies. The review also identifies the implications of digital technologies on accounting education in higher education. Adapting to these changes is essential if students are to be equipped to excel in the accounting profession in the future. This paper advocates for continued research and collaboration to investigate the dynamic landscape of accounting education in higher education in the digital era. Given the trend towards increased transparency, accountability and the potential bias of digital transformation in accounting education in higher education, the authors believe that this research makes a valuable contribution to the topic it investigated. Bias could manifest in access to digital resources, curriculum development, skills development, research and data interpretation. Digital transformation may favour institutions with more resources, leaving underfunded schools at a disadvantage. This could lead to unequal opportunities for students based on their institutions' ability to invest in advanced digital learning tools. If digital learning platforms and AI-driven educational tools are developed by certain organisations or regions, they may reflect specific accounting practices, standards or perspectives, thereby potentially favouring certain approaches while marginalising others. The integration of digital tools may prioritise specific technical competencies over foundational accounting principles. If educators focus more on teaching students how to use software rather than to apply accounting concepts, it could lead to an imbalance in students' expertise. Digital transformation enables data-driven decision-making, but the way data is collected, interpreted and presented can be biased. For instance, if AI-powered analytics rely on historical financial trends, they might inadvertently reinforce outdated or region-specific biases. It would be valuable for research to explore ways to mitigate bias and ensure inclusivity in accounting education as digital transformation continues. Accounting businesses, higher education policymakers, educators and developers of accounting curricula should work together to ensure that digital transformation of accounting in higher education is implemented.

Keywords: *Higher education, Digital transformation, Accounting education, Evolution, Digital tools, Technologies*

1. Introduction

The future is being shaped by numerous accelerating transformations that are discontinuous, disruptive and different from historical practices. Understanding and leveraging these dynamics is necessary for navigating the complexities of the emerging global landscape. Higher education institutions are undergoing significant transformations in the way they prepare students for an employment market in the digital age. A multidisciplinary and real-world approach to education, research and entrepreneurship will enable higher education institutions to collaborate closely with industry, governments and academia to address fundamental and complex issues that are relevant globally. In the digital era, accounting education must extend beyond the transmission of traditional knowledge to encompass the cultivation of technological proficiency in students. Adapting to technological change constitutes a fundamental aspect of modern accounting education, necessitating not only curricular revisions but also pedagogical innovation and faculty development [1].

This transformation introduced both challenges and opportunities for accounting education, particularly regarding equipping students with the adaptability required to navigate technological advancements. Accordingly, the primary objective of this study was to examine the strategies shaping the evolution of accounting businesses and higher education, the integration of digital tools and technologies in accounting education and, in conclusion, the implications of digital transformation on accounting education in the future. The study begins with a literature review that identifies the strategic factors influencing the development of accounting businesses and higher education, with a particular focus on exploring the integration of digital technologies in accounting education. This review encompasses the strategies shaping the evolution of accounting businesses and higher education, digital transformation in accounting education and the challenges and opportunities presented by the digital transformation. The paper concludes with a synthesis of research findings and recommendations for future scholarly inquiry. Through this research, the authors aim to provide substantive insights for educators, policymakers and curriculum designers in accounting education at the tertiary level. The findings will inform strategies for integrating emerging technologies more effectively in the preparation of future accounting professionals. Ultimately, this study underscores the growing significance of digital technologies in accounting education and offers empirical evidence regarding their role in shaping academic success.

1.1 Strategies Shaping the Evolution of Accounting Businesses and Higher Education

The accounting profession has experienced significant change over the past few decades, with digital transformation playing a pivotal role in reshaping the landscape [2,3]. Cong et al. [4] explored the technological disruption of accounting and auditing and Crookes and Conway [5] highlight the technological challenges in accounting and finance. Kokina et al. [6] discusses the roles and competencies of the accountant in the age of automation. As the accounting profession becomes increasingly digital, knowledge of technology and readiness to use it have emerged as critical competencies for accountants.

Digital transformation, artificial intelligence (AI), automation, data management, workforce transformation, and evolving workplace models – such as hybrid, remote, and flexible work – are fostering a more equitable and accessible professional landscape [7].The work of Nadkarni and Prügl, titled “Digital Transformation: A Review, Synthesis and Opportunities for Future Research”, provides a comprehensive analysis of digital transformation by mapping key technological and organisational aspects. It systematically reviews studies published from 2001 to 2019 and identify technology and actors as the two primary dimensions of digital transformation [7]. These authors identify the pace of transformation, workplace culture and middle management perspectives as underdeveloped areas in research.

Business forces in 2030 and beyond that will shape businesses are the metaverse, quantum computing, AI, augmented reality, virtual reality, the Internet of Things (IoT) and blockchain. The metaverse requires changes to the way individuals experience the world in terms of remote working and the creation of digital identities [8]. Quantum computing offers a leap in processing power that will fast-track breakthroughs that can hardly be imagined today [9]. AI is becoming the heartbeat of many businesses. AI is a portal of

information that is used by businesses to make effective decisions quickly with predictive analytics [10]. Augmented and virtual reality – the human–computer interface – is a key nexus of innovation and connection that spans time and geographical limitations [11]. The IoT enables humans, businesses and homes to become more connected and communicative and could significantly change the way we live and work [12]. Blockchain is creating a more effective way of managing organisations and allows the building of a more private, secure, robust and decentralised “Internet of Trust” [13]. While digital transformation offers immense opportunities, it also presents challenges. The rapid evolution of technology demands continuous upskilling, and businesses must navigate ethical concerns related to AI and automation. Additionally, while blockchain promises enhanced security and decentralisation, its slow transaction speeds and error correction difficulties may limit scalability [14].

The evolution of higher education has been marked by significant milestones and continuous adaptation to changing requirements of the accounting profession. Higher education institutions are incorporating digital skills into their curricula to ensure graduates are well-versed in technologies relevant to the current job market. Emphasis on programming, data analysis and proficiency with digital tools has become essential for various disciplines [15]. Many higher education institutions are adopting online learning platforms to provide flexible and accessible education. This approach enables students to acquire new skills and knowledge at their own pace, thereby catering to the demands of a fast-paced job market [16]. Collaboration between higher education institutions and industries is increasing, in order to bridge the gap between academic knowledge and industry needs. This collaboration often involves joint research projects, internships and guest lectures by industry professionals [17]. Traditional semester-based models are evolving towards more flexible and modular structures. Micro-credentials, nanodegree programmes and short-term courses enable students to acquire specific skills quickly and to respond to the dynamic job market [18]. Higher education institutions are encouraging students to develop entrepreneurial skills and mindsets. Programmes that support startup incubation, business development and innovation are becoming more prevalent [19]. The integration of adaptive technologies, such as AI in education, is helping personalise learning experiences and ensure that students can focus on areas where they need improvement and thereby enhance overall competence [20]. By recognising the importance of soft skills, higher education institutions are placing greater emphasis on communication, collaboration, critical thinking and problem-solving. These skills are fundamental for success in a rapidly changing job market [21]. Higher education institutions are increasingly engaging in international collaborations and offering global perspectives in their courses; this prepares students for a job market that is interconnected and often requires cross-cultural competencies [22]. Lifelong learning is being promoted, and professionals are being encouraged to continually update their skills. Higher education institutions are offering programmes for ongoing education and reskilling to help individuals stay relevant in their careers [23]. Higher education institutions are integrating data and analytics into their decision-making processes to help them understand student performance and tailor educational experiences. This data-driven approach extends to career counselling and guidance [24].

The integration of digital tools, which encompass e-learning platforms, accounting software and simulation technologies, is increasingly being acknowledged in higher education for its potential to enhance learning outcomes and stimulate innovation. These tools create interactive and practical learning environments and equip students with skills that are closely aligned with real-world applications [25]. By facilitating hands-on experiences with digital solutions and advanced accounting techniques, these tools encourage students to think creatively and develop innovative approaches to traditional accounting tasks [26]. Research reports a correlation between the use of digital tools in education and improved problem-solving abilities and increased engagement, which are critical drivers of innovation [27,28]. Consequently, higher education institutions that offer accounting programmes must adapt to these advancements to ensure that graduates possess the necessary skills to succeed in the contemporary business environment [29].

1.2 Digital Tools and Technologies in Accounting Education

Higher education institutions started offering accounting education in the late 19th century, when they focused primarily on technical training and preparation for the CPA exam [30]. Over time, the curriculum

expanded to include broader theoretical and analytical components, to reflect the increasing complexity of the financial landscape [31]. The primary objective of accounting education is to cultivate accounting practitioners who can contribute meaningfully to their professional organisations and society throughout their careers [32-34].

Academics in the discipline of accounting engage in the generation of new knowledge with practical applications and addressing fundamental challenges in the field, while ensuring that future professionals can effectively meet client needs [35,36]. Given that accounting curricula must be updated continuously to align with industry demands [37,38], educators must actively incorporate insights from industry professionals when they design academic programmes. Doing so ensures that accounting education remains relevant and responsive to the evolving landscape of the accounting profession.

The integration of digital tools and technologies transformed accounting education and enhanced both the accuracy and efficiency of financial reporting [39]. Scholars have explored areas such as the influence of technology on accounting curricula, the role of online learning platforms, the use of data analytics and AI in accounting and the changing nature of accounting pedagogy [40-42]. In accounting education, the effective use of digital tools goes beyond functional proficiency, by requiring students to apply these tools creatively to solve real-world challenges. The research of Prior et al. [43] underscores the critical role of digital literacy in equipping students to navigate complex digital environments, thereby fostering the innovative application of technology in both academic and professional contexts. By integrating technology in accounting education, students can experiment with diverse solutions, thereby fostering innovative thinking and adaptability. Haleem et al. [44] explain that these technologies enable learners to apply accounting principles in various contexts and promote creativity and innovative behaviours. Similarly, Watty et al. [45] argue that incorporating technology in accounting education challenges traditional pedagogies and inspires students to adopt innovative mindsets and approaches. According to scholars, students who use digital accounting tools are likely to try new approaches, such as automating tasks, using data analytics and looking into new ways to make decisions [46]. By simulating professional accounting scenarios, these tools strengthen technical skills and stimulate the exploration of innovative solutions to complex problems. The research of Al-Hattami [47] and Taib et al. [48] underscores the importance of integrating digital tools in accounting curricula, to prepare graduates for the dynamic and technology-driven nature of the profession. Digital literacy prepares accounting students for the world of work and instils an innovative mindset. Digital tools and technologies are transforming accounting education significantly, by making it more interactive, practical and aligned with the needs of the modern accounting profession.

Blockchain is being integrated in accounting education to instruct students about transparency and security in financial transactions; blockchain simulations assist students to understand applications in fields such as auditing and supply chain management. Scholars discuss the integration of blockchain in accounting education. Desplebin et al. [49] examined the practices and strategies of integrating blockchain in university accounting courses with reference to various approaches; they propose a research agenda. Mustafa [50] explored the applications and challenges of blockchain technology in higher education, including its use in accounting education. Pimentel and Boulianne [51] discuss current trends in blockchain education in accounting programmes and suggest future research directions. AI and machine learning are increasingly becoming part of accounting curricula, to automate routine tasks, analyse large datasets, and provide predictive insights. Integrating AI in education helps students develop skills that are fundamental for the future of the accounting profession. Slimi [52] explored the influence of AI on higher education, including its impact on teaching, learning and the development of new skills for future careers. The research of Shevchuk and Radelytskyy [53] investigated the influence of AI on accounting and auditing education and emphasise the need for education reform and to incorporate AI-related competencies. The article ‘The Impact of Artificial Intelligence Applications on Improving the Accounting Profession’ by Grabińska et al. [54] discusses integrating AI content in accounting curricula to prepare students for an AI-transformed profession. These scholars provide a solid foundation for understanding how AI and machine learning are being integrated into higher education accounting programmes.

Scholars illustrate how digital tools enhance the learning experience for students and better prepare them for the demands of the modern accounting profession. Cohn [55] highlights the benefits of Cloud-based

accounting software, which include enhanced data accessibility, security and collaboration. Cloud solutions help streamline operations, reduce costs and improve efficiency in accounting practices. Li et al. [56] focused on using data visualisation tools such as Tableau and Power BI to help transform raw financial data into meaningful visual representations and to aid trend analysis and decision-making. This study emphasises the importance of these tools for enhancing analytical skills and improving the communication of complex data. Davis and Davis [57] examined the impact of virtual learning environments (VLEs) on student engagement and learning outcomes. Their research explains how VLEs provide flexible and interactive learning experiences and allow students to access course materials, participate in discussions and collaborate with peers from anywhere. The case studies show that VLEs can support self-regulated learning, enhance student motivation and improve academic performance. The findings suggest that integrating VLEs into accounting education can better prepare students for the demands of the modern profession. Andiola et al. [58] report on accounting department leaders' experiences and insights regarding integrating technology and data analytic skills into the accounting curriculum. The study of Ma and Ruannakarn [59] evaluated the impact of the application of the Internet and technology in accounting education on academic performance. The results show that the average score of students increased significantly after the application of technology, thereby indicating that the Internet and technology plays a significant role in improving academic performance in accounting. As technology continues to develop, the education field should continue to explore and adapt to new technologies to prepare students for the needs of a future accounting industry.

These studies illustrate how technological advancements are reshaping accounting education and practice, making education and practice more efficient, interactive and aligned with the needs of the contemporary job market. As higher education institutions continue to embrace these advancements, the role of digital transformation in accounting education becomes increasingly important for preparing students for the dynamic and evolving field of accounting. Digital tools and technologies not only enhance the learning experience of students but also better prepares them for the demands of the modern accounting profession.

1.3 Challenges and Opportunities of Digital Transformation

Digital transformation in accounting education is not without its difficulties; digital transformation presents a complex landscape filled with challenges and opportunities. This duality is well documented in scholarly literature, which exposes the multifaceted nature of integrating digital technologies in accounting curricula.

The challenges of digital transformation for higher education institutions became a reality at the time of the COVID-19 pandemic, which prompted an increase in digital/hybrid teaching; other triggers were the considerations for higher education institutions to be in the "platform" business and because public higher education institutions no longer have the historical dominance they once had over higher education, because new competitors had emerged [60]. "Platform business" refers to higher education institutions adopting digital platforms to facilitate learning, administration and engagement. Instead of operating solely as traditional educational providers, universities and colleges are increasingly leveraging technology to create interconnected ecosystems in which students, faculty and external stakeholders interact. Traditionally, government-funded universities and colleges were the primary providers of advanced education, often with limited competition from alternative educational models. However, this monopoly has weakened owing to the emergence of new competitors, including private universities and colleges that offer specialised programmes or flexible learning models, online education platforms such as Coursera, edX, and Udemy, which provide accessible learning alternatives, corporate training programmes developed by major companies, which allow employees to gain skills without enrolling in traditional institutions, and hybrid and micro-credential education providers, which offer industry-recognised certifications instead of full degrees. As a result, public higher education institutions must now compete in an expanded educational landscape, where students have choices beyond traditional university degrees. This shift is reshaping higher education, by making it more diverse and market driven. Older higher education institutions are losing ground to competitors that can offer better experiences and credentials and, significantly, in-demand skills that enhance employability [61].

Jones et al. [62] elaborate on the following challenges of digital transformation in accounting education: faculty resistance, resource constraints and the need for continuous updates to curriculum and technology. Many accounting programmes continue to emphasise traditional methods of teaching and learning, and this approach could leave graduates ill-prepared for the digital demands of the contemporary workplace. J. Kee [63] suggests that educators and students could be resistant to adopting modern technologies owing to comfort with existing methods or apprehension about the unknown. Overcoming this resistance requires strategic change management and comprehensive training programmes. This gap necessitates continuous updating of the curriculum to incorporate digital competencies. Furthermore, students may face challenges in adapting to new digital tools and technologies, which can affect their learning outcomes and overall preparedness for the workforce [64]. There could be a disconnect between the digital skills taught in academic programmes and those required by employers. Bridging this skills gap necessitates ongoing collaboration between academia and industry [58]. This collaboration can ensure that accounting programmes remain relevant and responsive to the dynamic needs of the profession. The study by Bowles et al. [65] explains that accounting professionals should be “future-proofed” to ensure graduate employability and future readiness. Spraakman et al. [66] describe requirements for management accounting graduates from employers’ perceptions of information technology competency.

Education institutions often face resource constraints, including limited funding, restricted access to the latest software and a shortage of trained faculty that can teach digital skills. The need for a robust technology infrastructure to support digital learning tools presents a significant challenge, particularly for institutions with limited resources [67]. These constraints can hinder the effective integration of digital technologies severely.

The increased use of digital tools also raises significant concerns about data security and privacy. Institutions must implement robust cybersecurity measures to protect sensitive information [59]. Research by Sledgianowski et al. [68] explored the integration of Big Data, technology, and information systems competencies into the accounting curriculum. Wang [69] explains the challenges and experiences of integrating data analytics into the accounting curriculum at DePaul University. He also identifies future research directions to improve our understanding of the impact of emerging technologies on the accounting profession and education. The work of Zhang et al. [42] discusses the impact of disruptive technologies such as robotic process automation, AI and blockchain on accounting education. They suggest that these technologies necessitate significant changes in the curriculum to prepare students for the evolving demands of the profession.

The study of Albrecht and Sack [40], ‘Accounting Education: Charting the Course through a Perilous Future’, highlights challenges and reforms needed in accounting education. They argue that the traditional accounting curriculum is outdated and fails to equip graduates with the skills they need in a rapidly changing business environment. Their study describes (1) The need for accounting programmes to update their curricula to include more relevant topics, such as information technology, ethics and communication skills; (2) The importance of developing soft skills, such as critical thinking and problem-solving, alongside technical accounting knowledge; (3) The need for closer collaboration between academia and industry to ensure that educational programmes align with the evolving needs of the profession; and (4) The declining interest in accounting careers among students; they suggest that more engaging and dynamic teaching methods are needed to attract and retain top talent. Their work has been influential in prompting discussions and initiatives aimed at reforming accounting education to better prepare students for the demands of the modern workforce. Digital tools can create interactive and engaging learning environments and improve student comprehension and retention.

Opportunities for digital transformation include increased accessibility, global collaboration, and the alignment of education with industry demands. Digital transformation supports lifelong learning, thereby enabling professionals to stay updated with the latest industry trends and technologies. This ongoing education is decisive for maintaining relevance in a rapidly evolving field [58]. In a comparative study by Nwokike and Eya [64], discussed the perceptions of accounting educators and accountants, the skills required of accounting education graduates in automated offices.

The integration of digital technologies into accounting education presents numerous opportunities to enhance the learning experience and to better prepare students for the demands of the modern

accounting profession. Integrating real-world applications and technologies such as data analytics and blockchain into the curriculum provides students with practical skills that are directly applicable to the workforce. This hands-on experience is invaluable for preparing students for unknown real-world challenges [70].

Digital tools create interactive and practical learning environments by equipping students with skills that are closely aligned with real-world applications [25]. These tools facilitate hands-on experiences with digital solutions and advanced accounting techniques and encourage students to think creatively and develop innovative approaches to traditional accounting tasks. Research by Pilav-Veli et al. [27] demonstrates a correlation between the use of digital tools in education and improved problem-solving abilities. These tools enable students to experiment with diverse solutions and foster innovative thinking and adaptability.

Digital technologies can increase student engagement by making learning more interactive and enjoyable. This increased engagement is a critical driver of innovation, as it motivates students to explore innovative ideas and approaches [28]. Integrating digital tools in accounting curricula ensures that graduates possess the skills they need to succeed in the contemporary business environment. This alignment with industry demands is critical for promoting adaptive and forward-thinking approaches in the field [46]. Digital transformation facilitates global collaboration by enabling students and educators to connect and share knowledge across geographical boundaries. This global perspective enriches the learning experience and prepares students for the interconnected nature of the modern business world. Digital tools provide flexible learning resources that can be accessed at any time and from anywhere, thereby making education more accessible to a broader range of students. Online and hybrid learning models offer greater flexibility and make education more accessible to a diverse range of students. This flexibility is particularly beneficial for non-traditional students who may have other commitments [59]. The integration of digital technologies in accounting education helps develop students' digital literacy – a critical competency in today's technology-driven world. This literacy includes understanding and effectively using digital tools, which is essential for modern accounting professionals). Digital platforms also facilitate better collaboration between students, educators and industry professionals.

Addressing the challenges while leveraging the opportunities for digital transformation in accounting education can significantly enhance the quality and relevance of educational programmes. By embracing these changes, higher education institutions can better prepare students for the dynamic landscape of the accounting profession.

2. Methodology

The primary research method employed in this study was a comprehensive literature review, with the intention of clarifying current perspectives on strategies shaping the evolution of higher education, particularly in the context of accounting education. A qualitative approach was chosen to provide a qualitatively rich depiction of the phenomena under investigation [71,72]. This literature review involved an examination of research to identify current key trends related to digital transformation in accounting education. This method allowed for a descriptive and theoretical exploration of the problem and facilitated a nuanced understanding of how digital technologies are reshaping education strategies at higher education institutions.

The primary objective of this research was to offer valuable insights into the integration of digital tools to enhance learning outcomes and foster innovation in accounting education. Addressing this integration is fundamental for promoting adaptive and forward-thinking approaches in the field [46]. The findings of this study aim to guide the strategic incorporation of digital tools in accounting curricula, thereby preparing students to excel in an increasingly digital and complex financial landscape. The study concludes with a discussion of the implications for higher education institutions and future directions for the evolution of accounting education through digital transformation. The transformative impact of digital technologies on accounting education is examined and ongoing research and collaboration is encouraged, to explore and adapt to the evolving landscape of accounting education in the digital age.

3. Conclusion

The transformation of higher education institutions in the digital age represents a complex and multifaceted attempt to align education practices with the demands of a rapidly evolving job market. The world of work has changed, but the need for a capable, strategic workforce has not. The need for a technology-driven workforce and a shift in skills and education requirements requires a paradigm shift in higher education – not only digitalisation but reinvention of higher education is needed to boost student learning. Higher education institutions must prioritise data, technology and human literacy to produce "robot-proof" graduates. The digital transformation of higher education, which was accelerated by the COVID-19 pandemic, brought with it significant challenges and opportunities for accounting education. Traditional public higher education institutions face increased competition from new, smaller and online entrants to the tertiary education field that offer more flexible and in-demand skills needed for employability. This shift necessitates a re-evaluation of the way accounting education is delivered and the skills it imparts. As higher education institutions continue to embrace digital transformation, the role of technology in accounting education becomes increasingly critical. By simulating professional accounting scenarios and fostering innovative solutions to complex problems, digital tools and technologies are reshaping accounting education to be more interactive, practical and aligned with the needs of the contemporary job market. This transformation not only enhances the learning experience for students but also better prepares them for the dynamic and evolving field of accounting and ensures that they are equipped to meet the challenges of the modern profession.

The flexibility offered by hybrid and online learning will continue to increase and provide students with more accessible and diverse educational opportunities. Digital collaboration tools and online simulations will enhance the learning experience. There will be a stronger emphasis on practical skills development, such as financial modelling and data analysis, through real-world scenarios and software training. This hands-on approach will ensure that graduates are ready to meet the demands of the modern workforce. Lifelong learning and continuous professional development will become a cornerstone of accounting education and will be accompanied by ongoing training and certification programmes to keep professionals updated on the latest technological advancements and industry practices. These directions highlight accounting education's dynamic and evolving nature, which is driven by digital transformation. Embracing these changes will be decisive for preparing students to thrive in the landscape of the accounting profession in the future. To foster innovation and to better prepare students for technology-driven careers, accounting programmes in higher education should integrate advanced digital tools in their curricula. Educators should go beyond merely providing access to these tools by designing learning environments that encourage experimentation, problem-solving and creative thinking. Practical training such as hands-on workshops and certifications in accounting software can enhance students' confidence and competence in using these tools innovatively.

This study examined the outcomes of digital transformation on accounting education at higher education institutions. The analysis is underpinned by a review of the literature concerning the strategies shaping the evolution of accounting education. The integration of digital tools and technologies in accounting education marks a transformative shift, from traditional pedagogies to innovative, technology-driven learning environments. Accounting curricula, which were initially focused on technical training and CPA exam preparation, have evolved to encompass broader theoretical and analytical components, thereby reflecting the complexities of the modern financial landscape. This evolution is accelerated further by the adoption of digital tools that enhance the accuracy and efficiency of financial reporting and foster creative problem-solving skills in students.

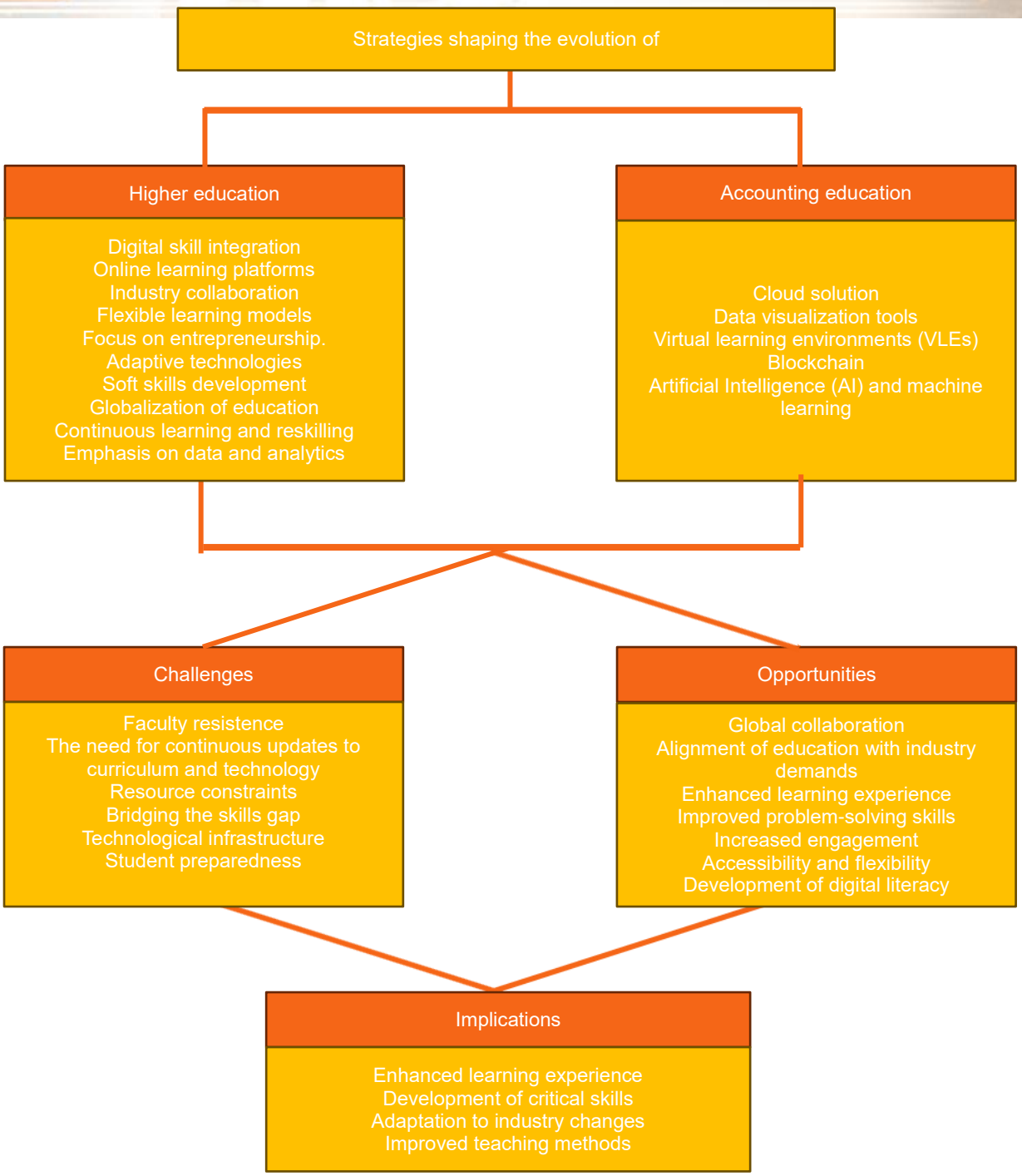

Fig 1. Digital transformation

The strategies shaping the evolution of accounting education indicated in Fig. 1 are Cloud solutions, data visualisation tools, VLEs, blockchain, AI and machine learning. Digital literacy has become a cornerstone of accounting education and enables students to navigate complex digital environments and apply

technology innovatively in both academic and professional contexts. The use of Cloud-based accounting software, data visualisation tools, VLEs, and blockchain technology exemplifies the way digital tools can streamline operations, enhance analytical skills and improve student engagement and learning outcomes. These technologies not only prepare students for the demands of the modern accounting profession but also promote creativity, adaptability and innovative thinking. Moreover, the integration of artificial intelligence and machine learning in accounting curricula underscores the need for education reform to incorporate AI-related competencies. These advances enable students to automate routine tasks, analyse large datasets and provide predictive insights, thereby equipping them with skills fundamental to the future of the accounting profession.

The challenges facing digital transformation in Figure 1 include resistance by faculty, the need for continuous updates to the curriculum and technology, resource constraints, the need to bridge the skills gap, shortage of technology infrastructure, and lack of student preparedness. Resource constraints, such as limited funding and access to the latest software, pose significant hurdles for institutions. Additionally, the increased use of digital tools raises concerns about data security and privacy and necessitate robust cybersecurity measures. Many accounting programmes still emphasise traditional methods, which may leave graduates unprepared for the demands of the modern digital workplace. Overcoming these challenges requires strategic change management, comprehensive training programmes and ongoing collaboration between academia and industry to ensure that curricula remain relevant and responsive to professional needs. Despite these challenges, the integration of digital tools can create interactive and engaging learning environments that improve student comprehension and retention.

In Figure 1, the opportunities offered by digital transformation for students and academics are global collaboration, alignment of education with industry demands, an enhanced learning experience, improved problem-solving skills, increased engagement, accessibility and flexibility, and the development of digital literacy. Digital tools support lifelong learning by enabling professionals to stay updated with the latest trends and technologies. Integrating real-world applications such as data analytics and blockchain in curricula provides students with practical skills that are directly applicable to the workforce by fostering innovative thinking and adaptability. Digital technologies can also increase student engagement by making learning more interactive and enjoyable and motivating students to explore innovative ideas and approaches. This engagement is crucial for developing the skills necessary to succeed in the contemporary business environment. Furthermore, digital transformation facilitates global collaboration by enriching the learning experience and preparing students for the interconnected nature of the modern business world.

In conclusion, while the digital transformation of accounting education presents significant challenges, it also offers numerous opportunities to enhance the learning experience and better prepare students for the demands of the modern profession. By embracing these changes, higher education institutions can ensure that graduates are equipped with the skills they need to thrive in a rapidly evolving field.

A comprehensive review of the literature on digital transformation underscores the imperative for accounting programmes to adapt to technological advancements, thereby ensuring that graduates are adequately prepared for the modern workforce. The integration of digital tools and technologies not only enhances the educational experience for students but also equips them with the skills they need to meet the demands of the modern accounting profession. Effectively addressing the challenges and capitalising on the opportunities presented by digital transformation in accounting education can improve the quality and relevance of academic programmes.

The research concludes by explaining the implications of digital transformation in accounting education in higher education institutions. The implications as indicated in Figure 1 include future directions for the evolution of accounting education through digital transformation. The future of accounting education is poised for significant transformation driven by digital advancements. As businesses prioritise environmental, social and governance issues, accounting education will increase its focus on ethical standards and sustainability, to ensure that future accountants are equipped to handle the complexities of modern financial reporting. Digital tools such as Internet+ technology, AI and data analytics can lead to enhanced learning experiences and improve academic performance by providing flexible learning resources, interactive environments and practical materials. This can lead to better engagement and understanding of complex accounting concepts by students.

The integration of digital tools and technologies in accounting education in higher education will enable students to handle large datasets, uncover patterns and make data-driven decisions. This shift will prepare students for roles that require advanced analytical skills. The integration of digital technologies helps students develop critical skills such as digital literacy, data analysis and ethical decision-making. These skills are decisive for modern accountants who need to navigate an increasingly digital and data-driven environment.

As the accounting profession evolves through technologies such as blockchain, robotic process automation and Cloud computing, education must adapt to prepare students for changes in the industry. This adaptation includes updating curricula to include these technologies and their applications in accounting. AI and machine learning are likely to play a decisive role in automating routine tasks, which will enable students to focus on strategic decision-making and problem-solving once they have qualified as accountants. These technologies will also be used to create adaptive learning environments that personalise education according to individual student needs. The potential of blockchain to enhance transparency and accuracy in financial reporting will be integrated in accounting curricula. Students will learn how to use blockchain for secure and verifiable transaction recording, which is becoming increasingly important in the industry. Digital transformation also allows for innovative teaching methods, such as online simulations, virtual classrooms and interactive modules. These methods can make learning more engaging and accessible by catering to diverse learning styles.

Overall, integrating digital technology in accounting education can significantly enhance the quality of education, prepare students for the future and ensure they are equipped with the necessary skills to succeed in a rapidly changing industry. This paper advocates for continued research and collaboration to further investigate and adapt to the dynamic landscape of accounting education in higher education in the digital era.

REFERENCES

[1] Handoyo S, Anas S. Accounting education challenges in the new millennium era: Impact of advanced of technology and dynamic business environment. Journal of Accounting Auditing and Business. 2019;2(1):25. https://doi.org/10.24198/jaab.v2i1.20429

[2] Busulwa, Richard & Evans, Nina. (2021). Digital Transformation in Accounting. 10.4324/9780429344589.

[3] Chui M, Manyika J, Miremadi M. Where machines could replace humans – and where they can't (yet). McKinsey Quarterly. 2016; 3:58-69. Available from: https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet

[4] Cong Y, Du H, Vasarhelyi MA. Technological disruption in accounting and auditing. Journal of Emerging Technologies in Accounting. 2018;15(1):1-10.

[5] Crookes G, Conway E. Technological technology challenges in accounting and finance. Contemporary Issues in Accounting, 61-83. https://doi.org/10.1007/978-3-319-91113-7_4.

[6] Kokina, J., Gilleran, R., Blanchette, S., & Stoddard, D. (2019). Accountant as digital innovator: Roles and competencies in the age of automation. SSRN Electronic Journal.

[7] Nadkarni S, Prügl R. Digital transformation: A review, synthesis and opportunities for future research. Management Review Quarterly. 2021; 71:233-341. https://doi.org/10.1007/s11301-020-00185-7

[8] Dhami MK, Zhu Y. Possibilities for decision science in the metaverse. Decision. 2024;11(4):523–36. https://doi.org/10.1037/dec0000235

[9] Memon QA, Al Ahmad M, Pecht M. Quantum computing: Navigating the future of computation, challenges, and technological breakthroughs. Quantum Reports. 2024;6(4):627-63. https://doi.org/10.3390/quantum6040039

[10] Brynjolfsson E, McAfee A. The business of artificial intelligence: What it can – and cannot – do for your organization. Harvard Business Review. 2017. https://hbr.org/2017/07/the-business-of-artificial-intelligence

[11] Miller MR, Bailenson JN. Augmented reality. In: Worthington DL, Bodie GD, editors. The handbook of listening. Wiley Blackwell; 2020. p. 409-17. https://doi.org/10.1002/9781119554189.ch28

[12] Choudhary A. Internet of Things: A comprehensive overview, architectures, applications, simulation tools, challenges and future directions. Discover Internet of Things. 2024; 4:31. https://doi.org/10.1007/s43926-024-00084-3

[13] Dimitropoulos G. The use of blockchain by international organizations: Effectiveness and legitimacy. Policy and Society. 2022;41(3):328-42. https://doi.org/10.1093/polsoc/puab021

[14] Fuller SH, Markelevich A. Should accountants care about blockchain? Journal of Corporate Accounting & Finance. 2020; 31:34-46. https:// doi. org/ 10.1002/ jcaf. 22424

[15] Akour M, Alenezi M. Higher education future in the era of digital transformation. Education Sciences. 2022;12(11):1-13. https://doi.org/10.3390/educsci12110784

[16] Graham CR, Woodfield W, Harrison JB. A framework for institutional adoption and implementation of blended learning in higher education. The Internet and Higher Education, 2013;18:4-14. https://doi.org/10.1016/j.iheduc.2012.09.003

[17] Reyes Rios C. Higher education and industry collaborations: A primer. United States Agency for International Development; 2022.

[18] Müller C, Mildenberger T, Steingruber D. Learning effectiveness of a flexible learning study programme in a blended learning design: Why are some courses more effective than others? International Journal of Educational Technology in Higher Education, 2023;20(10). https://doi.org/10.1186/s41239-022-00379-x

[19] Lv Y, Chen Y, Sha Y, Wang J, An L, Chen T, Huang X, Huang L. How entrepreneurship education at universities influences entrepreneurial intention: Mediating effect based on entrepreneurial

competence. Frontiers in Psychology, 2021;12: Article 655868. https://doi.org/10.3389/fpsyg.2021.655868

[20] Kurt S. Adaptive learning: What is it, what are its benefits and how does it work? Educational Technology; 2021 Apr 1.
[21] Chamorro-Premuzic T, Arteche A, Bremner AJ, Greven C, Furnham A. Soft skills in higher education: Importance and improvement ratings as a function of individual differences and academic performance. Educational Psychology, 2010;30(2):221-41. https://doi.org/10.1080/01443410903560278
[22] Altbach PG. Global perspectives on higher education. Johns Hopkins University Press; 2016. https://doi.org/10.1353/book.43394
[23] Taylor JM, Neimeyer GJ. Continuing education and lifelong learning. In: Norcross JC, VandenBos GR, Freedheim DK, Campbell LF, editors. APA handbook of clinical psychology: Education and profession. American Psychological Association. p. 135–52. https://doi.org/10.1037/14774-009
[24] Clow D. An overview of learning analytics. Teaching in Higher Education, 2013;18(6):683-95. https://doi.org/10.1080/13562517.2013.827653
[25] Khafit A, Rahman A, Sari D. Interactive learning environments in accounting education. International Journal of Educational Technology. 2020;15(2):123-35.
[26] Laily N, Putri R, Santoso H. Innovative approaches in accounting education through digital tools. Journal of Accounting and Finance. 2021;42(1):78-92.
[27] Pilav-Veli A, Kovačević M. The impact of digital tools on problem-solving skills in accounting education. Journal of Educational Research, 2021;29(4):301-15.
[28] Popa M, Ionescu C, Dumitrescu A. Digital transformation and student engagement in accounting education. Journal of Higher Education Studies. 2024;40(1):112-28.
[29] Graham J, Ward K. Adapting accounting education to technological advancements. Journal of Accounting Education, 2017;35(3):45-60.
[30] Chu S, Man H. History of accounting education. Journal of Higher Education Theory and Practice, 2012;12(1):119-28.
[31] Van Wyhe G. A history of U.S. higher education in accounting, Part II: Reforming accounting within the academy. Accounting Historians Journal. 2007;34(2):1-28.
[32] International Federation of Accountants. Framework for international education statements. IFA; 2003.
[33] Barac K. South African training officers' perceptions of the knowledge and skills requirements of entry-level trainee accountants. Meditari Accountancy Research. 2009;17(2):19–46. http://dx.doi.org/10.1108/10222529200900010
[34] Wilkin C. Developing critical reflection: An integrated approach. The British Accounting Review. 2022;54(3):101043. https://doi.org/10.1016/j.bar.2021.101043
[35] Lubbe I. Educating professionals – describing the knowledge agency of accounting academics. Meditari Accountancy Research. 2014;22(1):107–27. http://dx.doi.org/10.1108/MEDAR-02-2014-0031
[36] Paisey C, Paisey N. The decline of the professionally-qualified accounting academic: Recruitment into the accounting academic community. Accounting Forum. 2017;41(2):57–76. http://dx.doi.org/10.1016/j.accfor.2017.02.001
[37] Hassall T, Joyce J, Montaño, JAD Anes. Priorities for the development of vocational skills in management accountants: A European perspective. Accounting Forum. 2005;29(4):379–394.
[38] Mantai L, Calma A. Beyond assuring learning: Greater challenges ahead for management educators. International Journal of Management in Education. 2022;20(3):100723. http://dx.doi.org/10.1016/j.ijme.2022.100723
[39] Evans E, Paisey C. Histories of accounting education – an introduction. Accounting History, 2018;23(1-2):3-13. https://doi.org/10.1177/1032373217742427
[40] Albrecht WS, Sack RJ. Accounting education: Charting the course through a perilous future. American Accounting Association; 2000.
[41] Arens AA, Elder RJ, Beasley MS, Hogan CE. Auditing and assurance services (16th ed.). Pearson; 2019.

[42] Zhang C(A), Dai J, Vasarhelyi MA. The impact of disruptive technologies on accounting and auditing education. The CPA journal (1975), Vol.88(9), pp.20-26. 09/01/2018.
[43] Prior D, Mazza T, Henson R. Digital literacy in accounting education: Preparing students for the future. Journal of Accounting Education, 2016;34(2):123-40.
[44] Haleem A, Javaid M, Khan IH. Technological advancements in accounting education: A pathway to innovation. Journal of Accounting and Finance. 2022;48(3):210-25.
[45] Watty K, McKay J, Ngo L. Incorporating technology in accounting education: Challenges and opportunities. Accounting Education, 2016;25(4):345-62.
[46] Theuri P, Weickgenannt A, Fox A. Digital transformation in accounting education: Strategies and implications. Journal of Accounting Education, 2024;42(1):15-30.
[47] Al-Hattami HM. Understanding perceptions of academics toward technology acceptance in accounting education. Heliyon. 2024;9(1):51-63.
[48] Taib F, Rahman A, Sulaiman M. Integrating digital tools into accounting curricula: Preparing graduates for a technology-driven profession. Journal of Accounting Education. 2022;45(3):210-25.
[49] Desplebin O, Lux G, Petit N. Inclusion of blockchain in university accounting curricula: An overview of practices and strategies. Accounting Education. 2024;34(2):265-86. https://doi.org/10.1080/09639284.2024.2321125
[50] Mustafa AMAR. Blockchain technology in higher education: A comprehensive review of applications and challenges. International Journal of Research Publication and Reviews. 2024;5(11):1266-76.
[51] Pimentel E, Boulianne E. Blockchain in accounting education: Current trends and future directions. Journal of Accounting Education. 2020;19(4);325-61. https://doi.org/10.1111/1911-3838.12239
[52] Slimi Z. The impact of artificial intelligence on higher education: An empirical study. European Journal of Education Studies. 2023;10(1). http://dx.doi.org/10.19044/ejes.v10no1a17
[53] Shevchuk, V, Radelytskyy, Y. Adaptation of accounting and audit education to the challenges of artificial intelligence. Economics, Entrepreneurship, Management. 2024;11(1):46-54. https://doi.org/10.56318/eem2024.02.046
[55] Cohn M. Enhancing learning through digital tools: Case studies in accounting education. Journal of Accounting Education, 2018;32(4):245-60.
[56] Li X, Zhang Y, Wang J. Digital tools in accounting education: A case study approach. Journal of Educational Technology, 2021;29(3):112-28.
[57] Davis J, Davis R. The impact of digital technologies on accounting education: Case studies and insights. Journal of Accounting and Finance. 2019;45(2):98-112.
[58] Andiola LM, Masters E, Norman C. Integrating technology and data analytic skills into the accounting curriculum: Accounting department leaders' experiences and insights. Journal of Accounting Education. 2020;50:100655. https://doi.org/10.1016/j.jaccedu.2020.100655
[59] Ma N, Ruannakarn P. The application of digital transformation in accounting education: A case study of internet + technology improving academic performance. Higher Education Studies. 2024;14(2). https://doi.org/10.5539/hes.v14n2p62
[60] American Psychological Association. Higher education is struggling. Psychologists are navigating its uncertain future. Monitor on Psychology. 2024;55(1). https://www.apa.org/monitor/2024/01/trends-higher-education-challenges
[61] Mallach EG. The competitive landscape of higher education: Adapting to digital transformation. Journal of Higher Education Studies, 2024;39(2):123-45.
[62] Jones R, Smith T, Brown L. Challenges in integrating digital technologies into accounting curricula. Journal of Accounting Education, 2018;36(4):245-60.
[63] Kee J. Adopting new technologies in accounting education: Overcoming resistance and fostering innovation. Journal of Accounting Education. 2024;47(1):78-92.
[64] Nwokike FO, Eya G. Perceptions of accounting educators and accountants on the skills required of accounting education graduates in automated offices. Journal of Accounting Education. 2015;29(2):123-35.

[65] Bowles M, Ghosh S, Thomas L. Future-proofing accounting professionals: ensuring graduate employability and future readiness. Journal of Teaching and Learning for Graduate Employability. 2020; 11:1–21. https://doi.org/10.21153/jtlge2020vol11no1art888

[66] Spraakman G, O'Grady W, Askarany D, Akroyd C. Employers' perceptions of information technology competency requirements for management accounting graduates. Accounting Education, 201524(5), 403-22. https://doi.org/10.1080/09639284.2015.1089177

[67] Brabete V, Barbu CM, Cîrciumaru D, Goagără D, Berceanu D. Redesign of accounting education to meet the challenges of artificial intelligence: A literature review. Amfiteatru Economic. 2024;26(65):275-93. https://doi.org/10.24818/EA/2024/65/275

[68] Sledgianowski D, Gomaa MI, Tan CEL. Toward integration of Big Data, technology, and information systems competencies into the accounting curriculum. Journal of Accounting Education. 2017; 38:81-93. https://doi.org/10.1016/j.jaccedu.2017.03.001

[70] Wang T. Integrating data analytics into the accounting curriculum: Lessons learned from a course on audit data analytics. Journal of Accounting Education, 2019;47:1-10. https://doi.org/10.1016/j.jaccedu.2019.02.002

[70] Kee HY. Incorporating digital skills in accounting education. In: Perdana, A, Wang, T, editors. Digital transformation in accounting and auditing. Navigating technological advances for the future. Springer, 2024. p. 3-27.

[71] Maserumule MH. Theoretical and methodological approaches in social sciences. Routledge; 2011.

[72] Baugh N, Guion L. Qualitative research in practice. Jossey-Bass; 2016.