Digital Leadership in Higher Education Institutions: A Conceptual Framework

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Abstract. This study explores digital leadership's role in driving sustainable performance in higher education institutions post-pandemic. The purpose of the study is to develop a framework linking digital leadership competencies to sustainable performance dimensions. Through a comprehensive literature review, key components of digital leadership and sustainable performance in higher education are identified. The resulting framework includes digital leadership competencies, mediating factors, and sustainable performance outcomes. Findings highlight the importance of effective digital leadership for institutions to thrive in an increasingly digital and competitive landscape. The framework provides insights for researchers and practitioners in higher education management. Implications include the need for developing digital leadership competencies, fostering digital culture, and adopting a holistic approach to digital transformation. The paper concludes that digital leadership is vital in driving sustainable performance across multiple dimensions in higher education institutions. Future research directions are proposed to empirically test and refine the framework.

Keywords: digital leadership, higher education, sustainable performance, post-pandemic, conceptual framework

1. Introduction

In this digital era, digital transformation of higher education has been accelerating rapidly. It has been driven by technological advancements and changing societal expectations [1,2]. The COVID-19 pandemic has further catalyzed this transformation, forcing institutions to rapidly adopt online and hybrid learning models, moreover, redesigning and reshaping traditional educational paradigms [3,4]. As universities navigate this new landscape, the concept of digital leadership has emerged as a critical factor in ensuring sustainable performance and long-term success [5,6].

Digital leadership in higher education extends beyond mere technological proficiency. It encompasses the ability of a leader to conceive and implement strategic change, bring up innovation, and process a culture that embraces digital transformation [7,8]. This various approach to leadership is crucial as institutions strive with the complexities of integrating technology into their core functions while maintaining academic integrity and quality [9,10]. As higher education institutions face increasing pressure to adapt to the digital age while maintaining their core educational missions, understanding the role of digital leadership becomes paramount [11,12]. The rapid pace of technological change, coupled with evolving student expectations and increasing global competition, require a new breed of leaders who can navigate these challenges effectively [13,14].

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Moreover, the concept of sustainable performance in higher education has gained significant attention in recent years, encompassing not only financial viability but also educational quality, research output, social impact, and environmental responsibility [15,16]. In this context, digital leadership plays an important role in driving sustainable performance by leveraging technology to enhance institutional efficiency, expand educational reach, and foster innovation in teaching and research [17,18].

This paper aims to explore the concept of digital leadership in higher education and its potential impact on sustainable performance. We propose a conceptual framework that integrates various aspects of digital leadership with key dimensions of institutional performance. By doing so, we seek to contribute to the theoretical understanding of digital leadership in the higher education context and provide practical insights for institutional leaders and policymakers [9,19]. The significance of this study lies in its potential to bridge the gap between digital leadership theory and practical application in higher education settings. As institutions continue to navigate the complexities of digital transformation, a comprehensive understanding of digital leadership and its impact on sustainable performance becomes increasingly valuable [1,6].

2. Conceptual Background

2.1. Digital Leadership in Higher Education

Digital leadership in higher education represents a paradigm shift in how institutional leaders navigate the complexities of the digital age. It goes beyond simply implementing new technologies, encompassing a holistic approach to leveraging digital tools and strategies to transform educational practices, research capabilities, and administrative processes [1,8]. Klein [20] categorizes digital leadership characteristics into three main groups: Digital Business, Social Attitude, and General Mindset. *Digital Business* characteristics focus on skills and abilities directly related to digital technologies, innovation, and new business models. This includes traits like being an innovative visionary, having digital intelligence, and business model innovation skills. *Social Attitude* characteristics emphasize the leadership and people skills needed in a digital environment. This includes being a motivating coach, having social intelligence, and fostering openness and transparency. *General Mindset* characteristics describe the overall mentality and approach digital leaders need to adopt. This includes being adaptable, agile, decisive, creative, and committed to lifelong learning. By possessing these characteristics across the three categories, digital leaders can effectively to navigate the complex, fast-paced digital business landscape, lead and motivate teams in virtual and distributed work environments, drive digital transformation initiatives, foster innovation and new digital business models, and adapt to rapid technological and organizational changes. Furthermore, the characteristics enable leaders to act swiftly and flexibly within networked and distributed organizational structures while managing the digital transformation of the institution.

Digital transformation in higher education involves more than just adopting new technologies. It requires a fundamental rethinking of educational models, administrative processes, and institutional cultures. Chatterjee et al. [21] strongly pointed that digital transformation in the workplace has a significant positive influence on organizational performance, highlighting the important role of digital leadership capability in enabling this process in higher education institutions.

Dinh et al. [12] define digital leadership as “the ability to create and execute strategies that leverage digital technologies to enhance organizational performance and create value”. This definition extends - in the context of higher education - to include the capacity to drive

innovation in teaching and learning, research methodologies, and institutional operations [13]. We could conclude that the key components of digital leadership in higher education include, as explained below: (a) Technological Fluency. Leaders must possess a deep understanding of emerging technologies and their potential applications in educational contexts [1,20]; (b) Data-Driven Decision Making. The ability to harness and interpret data to inform strategic choices is crucial in the digital age [21,22]; (c) Digital Strategy Development. Leaders must be adept at crafting comprehensive digital strategies that align with institutional goals and values [10,17]; (d) Virtual Team Management. As remote work becomes more prevalent, the ability to lead and motivate virtual teams is increasingly important [14,23]; (e) Digital Pedagogy and Instructional Design. Understanding and promoting innovative digital teaching methods is essential for enhancing educational quality [24,25]; (f) Cyber-security and Risk Management. Leaders must be aware of digital risks and implement robust security measures to protect institutional assets and stakeholders [26,27]; and, (g) Change Management in Digital Contexts. The ability to guide institutions through digital transformation while managing resistance and fostering a culture of innovation is crucial [9,11].

As previously mentioned, Ghamrawi and Tamim [30] define digital leadership as the skills and qualities that leaders adopt to foster a digital culture in their organizations. In these environments, members readily embrace and use digital technologies to enhance their own learning and support others' learning processes. The key points about the 5D typology for digital leadership attributes proposed by Ghamrawi and Tamim [30] are addressed in what follows: (1) Digital Competence. This refers to the digital expertise and fluency of the leader themselves. Effective digital leaders need to be highly proficient in using and leveraging digital technologies. Leading by example and demonstrating strong digital skills is crucial for inspiring and guiding others; (2) Digital Culture. This involves fostering an organizational culture that embraces digital innovation and the use of digital tools or practices. Developing shared values, norms, and collaborative behaviors around technology integration is important. Creating a digital-friendly environment where faculty and staff feel empowered to experiment and learn is key; (3) Digital Differentiation. This entails developing unique strategies to leverage digital technologies for competitive advantage. Identifying how digital tools and approaches can enhance the institution's programs, services, and learning experiences. Personalizing and customizing the use of technology to meet the diverse needs of students and faculty; (4) Digital Governance. This refers to implementing effective policies, procedures, and controls for managing digital resources and mitigating risks. Having an overarching authority to guide and direct the digital transformation efforts can help minimize resistance. Establishing clear accountability, responsibility, and decision-making structures around technology use is important; and, (5) Digital Advocacy. This involves actively promoting the benefits and value of digital technologies within and beyond the institution. Continuous communication, marketing, and evangelization of the digital agenda is crucial for garnering buy-in. Identifying and leveraging digital champions/early adopters to influence their peers can be an effective advocacy strategy.

Furthermore, Ghamrawi and Tamim [30] argue that this holistic 5D framework captures the key leadership attributes necessary for driving successful digital transformation in higher education institutions. Furthermore, these attributes support the adaptive capabilities of digital leadership in higher education contexts, allowing leaders to navigate the challenges of digitalization effectively.

2.2. Sustainable Performance in Higher Education

The concept of sustainable performance in higher education has evolved to encompass a multidimensional view of institutional success. It goes beyond traditional metrics of academic excellence and financial stability to include social responsibility, environmental sustainability, and long-term viability in a rapidly changing educational landscape [15,16]. The dimensions of sustainable performance in higher education having strong points including: (a) Educational Quality. Ensuring high-quality learning experiences and outcomes that prepare students for future challenges [3,25]; (b) Research and Innovation. Advancing knowledge creation and fostering innovative research practices [4,26]; (c) Financial Sustainability. Maintaining financial health through diverse revenue streams and efficient resource allocation [5,15]; (d) Social Impact. Contributing positively to society through community engagement, knowledge transfer, and addressing societal challenges [17,28]; (e) Environmental Responsibility. Implementing eco-friendly practices and promoting sustainability education [16,29]; and, (f) Institutional Adaptability. The capacity to evolve and respond to changing external environments and stakeholder needs [2,18].

Thus, the intersection of digital leadership and sustainable performance in higher education presents both opportunities and challenges. Digital technologies offer new avenues for enhancing educational delivery, expanding research capabilities, and improving operational efficiency. On the other sides, they also introduce complexities in terms of implementation, equity of access, and potential disruption to traditional academic models [14,19].

3. Methods

This study uses a literature review to create a framework connecting digital leadership skills to sustainable performance in higher education. The researchers analyzed existing studies on digital leadership, higher education management, and organizational performance. The methodology involves several steps: (1) Reviewing academic literature; (2) Identifying key components of digital leadership and performance in higher education; (3) Developing a framework linking leadership competencies to performance outcomes; (4) Incorporating various theories for a comprehensive view; (5) Considering post-pandemic challenges in higher education; and, (6) Suggesting practical implications and future research directions. This approach provides a holistic view of digital leadership in higher education, combining existing knowledge to create a new framework. It aims to guide future research and inform leadership practices in academic institutions, considering the unique aspects of higher education in the digital age.

4. Proposed Conceptual Framework

Drawing on the literature and emerging trends in higher education, we propose a conceptual framework that links digital leadership competencies to sustainable performance outcomes in higher education institutions. This framework objectives to illustrate the complex relationships between leadership capabilities, institutional factors, and performance dimensions in the context of digital transformation.

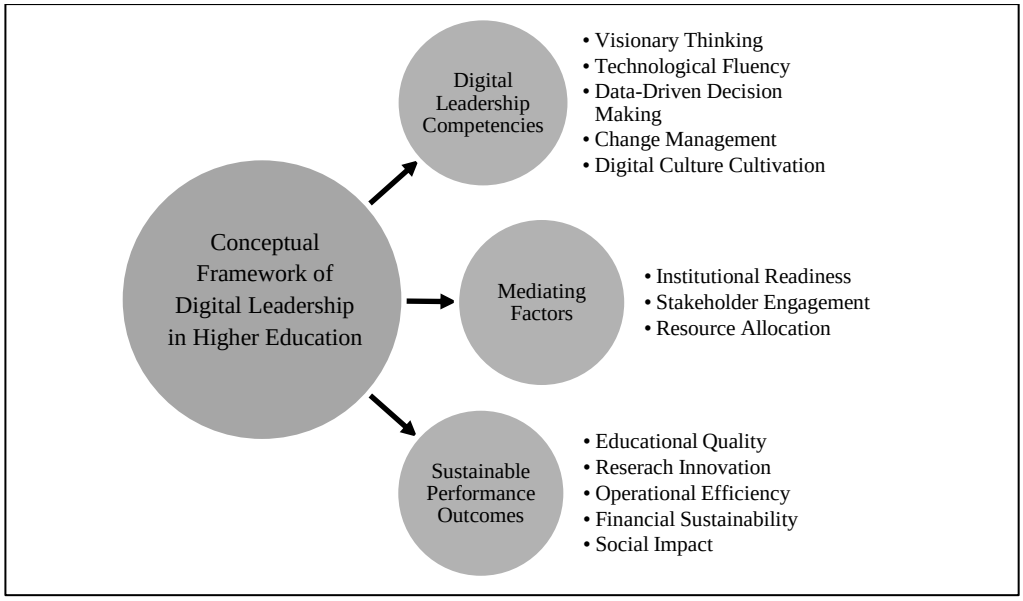

Figure 1. Conceptual Framework of Digital Leadership and Sustainable Performance in Higher Education

As described on Figure 1, the framework consists of three main components, there are (1) digital learning leadership competencies; (2) mediating factors, and (3) sustainable performance outcomes, as explained below:

4.1. Digital Leadership Competencies.

These competencies form the foundation of the framework. They represent the key skills and abilities that leaders in higher education need to effectively navigate the digital landscape, consisting of: (1) Visionary Thinking. The competency of visionary thinking involves the ability to predict and articulate how digital technologies can revolutionize education and research. Leaders with strong visionary thinking can anticipate future trends, identify opportunities for digital innovation, and create compelling narratives about the institution's digital future [8,13]; (2) Technological Fluency. This refers to a deep understanding of emerging technologies and their potential applications in educational contexts. Leaders are not required to be technical experts, but they should have sufficient knowledge to make informed decisions about technology adoption and integration [1,20]; (3) Data-Driven Decision Making. Leaders, in the digital era, must be capable at leveraging data analytics to inform strategic choices. This involves not only understanding how to interpret data but also fostering a culture of data-driven decision-making throughout the institution [21,22]; (4) Change Management. Digital transformation often requires significant organizational change. Leaders must be skilled in guiding their institutions through these changes, addressing resistance, and ensuring smooth transitions [9,11], and (5) Digital Culture Cultivation. The competency of digital culture cultivation involves creating an environment that embraces innovation and digital practices. Leaders need to foster a culture where experimentation is encouraged and digital skills are valued and developed [7,17].

4.2. Mediating Factors.

These factors represent the institutional context that can either facilitate or hinder the impact of digital leadership. Mediating factors consist of the following points as explained: (1) Institutional Readiness. This refers to the organization's overall capacity to adopt and implement digital initiatives. It includes factors such as existing technological infrastructure, staff digital literacy, and organizational flexibility [27,30]; (2) Stakeholder Engagement. The involvement of various stakeholders (i.e. faculty, staff, students, external partners) in digital transformation efforts is crucial. Effective engagement can reduce resistance and increase the possibility of successful implementation [23,31], and; (3) Resource Allocation. This involves the strategic investment in digital infrastructure and capabilities. It is not just about the amount of resources allocated, but also how effectively they are distributed and utilized[10,32].

4.3. Sustainable Performance Outcomes.

It refers to the long-term, positive results achieved through the strategic use of digital technologies and leadership practices that enhance institutional effectiveness, student success, lifelong learning and societal impact, are addressed in what follows: (1) Educational Quality. This encompasses enhanced learning experiences and outcomes through digital tools and pedagogies. It might include improved student engagement, personalized learning experiences, and better learning analytics [3,25]; (2) Research Innovation. This refers to improved research capabilities and outputs leveraging digital technologies. It could involve enhanced data analysis capabilities, improved collaboration tools, or new research methodologies enabled by digital technologies [4,26]; (3) Operational Efficiency. This outcome relates to streamlined administrative processes and improved resource utilization. Digital technologies can automate many processes, reducing costs and improving service delivery [14,24]; (4) Financial Sustainability. This involves diversified revenue streams and cost-effectiveness through digital initiatives. For example, online programs might reach new student markets, or digital tools might reduce operational costs.[5,15], and; (5) Social Impact. This outcome refers to increased accessibility and community engagement through digital platforms. It might include expanded access to education for underserved populations or improved community outreach through digital channels. [17,28].

The framework, as proposed, states that strong digital leadership competencies, when effectively applied and mediated by institutional factors, can lead to improved sustainable performance outcomes. In addition, it recognizes that the path from leadership competencies to outcomes is not direct, but is influenced by the institutional context. This framework distinctly provides a comprehensive view of how digital leadership can drive performance in higher education, acknowledging the complexities and interconnections between leadership, organizational factors, and outcomes. It can serve as a guide for institutions looking to develop their digital leadership capabilities and as a basis for further empirical research in this area.

5. Discussion

The proposed conceptual framework explains the complicated relationship between digital leadership competencies and sustainable performance outcomes in higher education institutions, mediated by crucial institutional factors. This framework offers several important insights for understanding and implementing effective digital leadership in the rapidly evolving landscape of higher education. The framework underscores the multifaceted nature of digital leadership

competencies. It suggests that effective digital leaders in higher education must possess a combination of visionary thinking, technological fluency, data-driven decision-making skills, change management capabilities, and the ability to cultivate a digital culture [1,8,13].These competencies are not isolated skills but interconnected abilities that enable leaders to navigate the complexities of digital transformation in academic settings. For instance, a leader with strong visionary thinking and technological fluency may be better positioned to identify and implement innovative online learning programs that enhance both educational quality and financial sustainability [1,32]. Firstly, digital leadership competencies explain that leadership competencies related to the digital realm are important. This could include skills like technological fluency, visionary thinking, and the ability to leverage technology. Secondly, as an institutional factors: These digital leadership competencies are said to be "mediated by institutional factors". This means that the specific organizational context, policies, culture, etc. of the higher education institution can influence how these digital leadership abilities manifest and impact the organization. Lastly, impact on sustainable performance, it means that the proposed framework argues that these digital leadership competencies, shaped by institutional factors, can significantly impact various aspects of sustainable performance in higher education. In other words, a leader's digital abilities can drive improvements in areas like educational quality and financial sustainability. For example, they can be illustrated that a leader with strong "visionary thinking and technological fluency" may be better equipped to guide the development of innovative online learning programs. This could potentially enhance educational quality by leveraging technology to improve learning outcomes. It could also enhance financial sustainability by enabling the institution to offer more cost-effective and accessible online programs. In summary, a framework suggesting that cultivating digital leadership competencies within the unique institutional context of a higher education organization can positively impact that organization's overall sustainable performance across multiple dimensions. The key is aligning digital leadership abilities with the specific institutional factors at play.

However, the effectiveness of digital leadership is not solely dependent on the competencies of the leaders. The framework emphasizes that institutional factors play a crucial mediating role. Two key factors highlighted are institutional readiness and stakeholder engagement. Institutional readiness refers to the organization's overall capacity to adopt and implement digital initiatives. This includes existing technological infrastructure, staff digital literacy, and organizational flexibility. Even a highly competent digital leader may face significant challenges if the institution lacks the necessary technological foundation or if there is a widespread lack of digital skills among staff [27]. Stakeholder engagement, particularly from faculty, is another critical factor. The success of digital initiatives often hinges on the buy-in and active participation of key stakeholders. As Fernandez and Shaw [11] note, "Effective crisis leadership in academia involves energizing, engaging, and empowering faculty". A digital leader may face substantial obstacles if there is significant resistance from faculty members who are skeptical about digital transformation or concerned about its impact on traditional academic practices. For instance, a digital leader aiming to implement a new learning management system might face challenges if the institution's IT infrastructure is outdated and unable to support the new system (lack of institutional readiness) and faculty members resist the change due to concerns about increased workload or perceived threats to academic freedom (lack of stakeholder engagement).

In such scenarios, the leader's digital competencies alone may not be sufficient to drive successful change. This underscores the need for digital leaders to not only possess technical skills but also excel in change management and stakeholder communication [31]. The

framework also highlights the interconnected nature of performance outcomes in higher education. This perspective aligns with systems thinking, recognizing that improvements in one area can have cascading effects across the institution. For example, the implementation of digital processes to streamline administrative tasks can lead to improved operational efficiency. This efficiency gain does not exist in isolation; it can free up valuable resources - both financial and human - which can then be strategically reallocated. These resources might be reinvested into enhancing research capabilities, such as acquiring advanced research software or funding innovative projects. Alternatively, they could be directed towards improving educational quality, perhaps by developing new online learning modules or providing faculty with advanced training in digital pedagogy [10,27]. This interconnectedness suggests that digital leaders need to think holistically about the impacts of their initiatives, considering both direct and indirect effects across various aspects of institutional performance.

The COVID-19 pandemic has served as a powerful catalyst, bringing the importance of digital leadership in higher education into sharp focus. The crisis forced institutions worldwide to rapidly transition to online learning and virtual operations, creating a natural experiment in digital transformation [4]. Leaders who possessed strong digital competencies were better positioned to navigate this abrupt shift. They demonstrated agility in quickly implementing online learning platforms, ensuring cybersecurity for remote operations, and leveraging digital tools for institutional communication and collaboration. This rapid adaptation was crucial not only for maintaining educational continuity in the short term but also for ensuring organizational sustainability in a highly uncertain environment [25]. We can say, institutions with leaders who had previously invested in digital infrastructure and cultivated a culture of digital innovation were generally able to transition more smoothly to online operations. This demonstrated how digital leadership competencies contribute to institutional resilience and adaptability in times of crisis. Finally, the framework emphasizes that successful digital leadership in higher education requires a delicate balance between embracing technological innovations and preserving core academic values. This concept aligns with the notion of “digital humanism” in education, as discussed by Jameson [8] and others.

Digital humanism situates that technology should be leveraged to enhance, rather than replace, human-centered learning experiences. In the context of higher education, this means using digital tools to augment traditional pedagogical approaches, foster meaningful human interactions, and support critical thinking and creativity. For example, a digital leader might implement an AI-powered adaptive learning system. However, the goal would not be to replace human instructors but to provide them with data-driven insights to better tailor their teaching to individual student needs. Similarly, while virtual reality might be used to create immersive learning experiences, it would complement rather than substitute for in-person laboratory work or field studies [13]. This balanced approach recognizes that the core mission of higher education goes beyond mere information transfer. It encompasses the development of critical thinking skills, fostering of creativity, and cultivation of ethical reasoning - aspects that require human guidance and interaction. Successful digital leaders in higher education must therefore be adept at identifying where technology can enhance these core educational values, rather than simply digitizing existing processes [8]. By maintaining this balance, digital leaders can drive innovation while ensuring that the fundamental human elements of education are preserved and enhanced. This approach is important for maintaining the quality and relevance of higher education in an increasingly digital world.

6. Implications and Future Research

This conceptual framework has several important implications for higher education leaders, policymakers, and researchers that can be detailed as follows: (1) Development of Digital Leadership Competencies. The framework underscores the need for intentional development of digital leadership competencies among current and aspiring higher education administrators [9,20] This suggests that leadership development programs in higher education should incorporate modules on digital strategy, technological fluency, and change management in digital contexts; (2) Holistic Approach to Digital Transformation. The framework encourages institutions to adopt a holistic approach to digital transformation, focusing not only on technological investments but also on cultivating a digital culture and ensuring stakeholder engagement in digital initiatives [7,23]. This implies that successful digital transformation requires attention to both technical and human factors; (3) Balancing Innovation and Tradition. The framework highlights the need for digital leaders in higher education to balance technological innovation with core academic values [8,13].. This suggests that effective digital leadership in academia requires a nuanced understanding of the unique culture and mission of higher education institutions, and; (4) Performance Measurement. By linking digital leadership to multiple dimensions of sustainable performance, the framework encourages institutions to adopt more comprehensive metrics for evaluating the impact of digital initiatives [5,17].

Future research directions emerging from this framework that can be inspired for globally researchers, as follow: (1) Empirical Testing. Future studies could empirically test the relationships proposed in this framework, examining how different digital leadership competencies impact specific performance outcomes in various institutional contexts [12,30]; (2) Longitudinal Studies. Given the rapidly evolving nature of digital technologies and their applications in higher education, longitudinal studies could explore how digital leadership evolves over time and its long-term effects on institutional performance [12,30]; (3) Cross-Cultural Comparisons. The global nature of higher education and the varying rates of digital adoption worldwide suggest the need for cross-cultural studies investigating how digital leadership practices and their impacts vary across different national and cultural contexts [15,28]; (4) Stakeholder Perspectives. Future research could explore the perceptions and experiences of various stakeholders (students, faculty, staff, administrators) regarding digital leadership and its impact on their roles and experiences in higher education [23,31]; (5) Leadership Development. Studies could examine the effectiveness of various approaches to developing digital leadership competencies in higher education administrators, informing the design of leadership development programs [9,20], and; (6) Resilience and Adaptability. In light of the COVID-19 pandemic, future research could focus on how digital leadership contributes to institutional resilience and adaptability in times of crisis [4,11]. Scholars, by addressing these research directions, can further refine and validate the proposed framework, contributing to a more nuanced understanding of digital leadership in higher education and its role in driving sustainable institutional performance in the digital era.

7. Conclusion

The conceptual framework presented in this paper offers a comprehensive approach to understanding digital leadership in higher education and its potential impacts on sustainable performance. By identifying key digital leadership competencies, crucial mediating factors, and multidimensional performance outcomes, the framework provides a roadmap for both research and practice in this rapidly evolving field. The framework underlines that effective digital

leadership in higher education goes beyond mere technological proficiency. It requires a combination of visionary thinking, change management skills, and the ability to foster a digital culture while respecting academic traditions [1,8,13]. Moreover, the framework highlights that the impact of digital leadership is not uniform across institutions but is mediated by factors such as institutional readiness, stakeholder engagement, and resource allocation [10,27,31]. As higher education institutions continue to navigate the complexities of the digital age, particularly in the wake of the COVID-19 pandemic, effective digital leadership will be crucial for ensuring sustainable performance across multiple dimensions from educational quality and research innovation to financial sustainability and social impact [4,15,25]. The framework presented in this paper contributes to the ongoing discourse on leadership in higher education by integrating digital competencies with broader organizational and performance factors. It provides a foundation for future empirical research and can guide the development of leadership programs and institutional strategies in the post-pandemic era [5,9].

In conclusion, as the higher education sector continues to evolve, the ability of leaders to navigate digital transformation while upholding academic values and mission will be more important. This conceptual framework looks to support the journey by providing a comprehensive view of digital leadership and its role in driving sustainable institutional performance in an increasingly digital and competitive landscape.

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