

Digital Transformation and Organizational Efficiency in Tertiary Education: A Conceptual Review of Academic Excellence in Global Financial Hubs

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ABSTRACT

The use of digital technologies is now a strategic imperative in higher education institutions worldwide, but the processes through which digital technologies affect organisational and academic performance are poorly understood. This conceptual review attempts to address this gap thru investigating the relationships between digital transformation, organisational efficiency and academic performance in higher education institutions in the prominent international financial centers, Singapore, Hong Kong, London and New York. Drawing on Dynamic Capabilities Theory, the review synthesises current research into a coherent conceptual model, incorporating organisational efficiency as the mediating mechanism between digital transformation efforts and academic outcomes. The analysis shows that digital transformation has a positive effect on institutional performance in general, but these effects are strongly moderated by organisational capabilities, institutional readiness, leadership endorsement, and contextual factors. The review identifies important gaps in empirical evidence, theoretical development, methodological approaches and contextual understanding that need to be further explored. This review formulates eight testable hypotheses and develops a theoretical framework to lay the groundwork for future empirical research on how universities in competitive global environments can strategically use digital capabilities to simultaneously improve operational efficiency and educational quality. The insights produced are of interest to university leaders, policy makers, and higher education administrators who are dealing with the complexities of digital transformation in globally interconnected institutional spaces.

Keywords: Digital Transformation; Organizational Efficiency; Academic Excellence; Dynamic Capabilities; Global Financial Hubs

INTRODUCTION

The digital transformation of higher education is a notable organizational shift within the contemporary knowledge economy. Universities globally are under pressure to enhance operational efficiency, improve educational quality, and remain competitive in international markets. Consequently, digital technologies have become both a strategic necessity and a source of institutional challenge (García-Morales et al., 2021; Kraus et al., 2021). This transformation involves more than just adopting technology; it necessitates fundamental changes in organizational structures, administrative procedures, pedagogical methods, and institutional culture. Therefore, understanding how digital transformation affects organizational efficiency and academic excellence is crucial for higher education leaders, policymakers, and researchers who are navigating this complex environment.

Digital transformation's impact is particularly evident in global financial centers, where universities operate in highly competitive, technology-driven, and internationally linked settings. Cities such as Singapore, Hong Kong, London, and New York offer distinct institutional contexts. These are characterized by advanced digital infrastructure, significant investment in educational technology, diverse international student bodies, and close ties to financial and professional services. Universities in these locations face increased stakeholder expectations regarding institutional performance, educational quality, and graduate employability. This makes digital transformation a strategic priority with direct consequences for institutional competitiveness and long-term viability (Mohamed Hashim et al., 2022; Toh & Looi, 2024).

While scholarly interest in digital transformation within higher education is growing, considerable gaps remain in understanding how digital technologies create organizational and academic value. Much current research has focused on either operational efficiency or educational outcomes independently, without fully exploring the interconnections between these performance dimensions. Additionally, comparative studies across different institutional and national contexts are limited, hindering a comprehensive understanding of how contextual factors influence digital transformation outcomes. These gaps are significant, considering the substantial investments universities are making in digital infrastructure and the high stakes involved in successful digital transformation.

This conceptual review aims to address these gaps by synthesizing existing theoretical and empirical literature. It proposes an integrated framework to examine the relationships among digital transformation, organizational efficiency, and academic excellence in tertiary education institutions within global financial hubs. Utilizing Dynamic Capabilities Theory (Bleady et al., 2018; Land et al., 2022) as a foundational perspective, this review posits that organizational efficiency acts as a mediating mechanism through which digital transformation initiatives contribute to improved academic outcomes. The review further suggests that institutional and contextual factors, such as digital maturity and leadership support, moderate these relationships, helping to explain variations in digital transformation success across universities.

This conceptual review addresses three interrelated research questions: (1) What is the impact of digital transformation on organisational efficiency of higher education institutions? (2) What is the mediating role of organisational efficiency in the relationship between digital transformation and academic excellence? (3) What contextual factors (e.g. institutional characteristics, national policies, digital maturity) influence these relationships in different contexts? Answering these questions should provide an integrated theoretical framework to advance the understanding of the complex dynamics of digital transformation in higher education.

LITERATURE REVIEW

The Concept of Digital Transformation in Higher Education

Digital transformation in higher education extends beyond the mere adoption of technology, involving a fundamental reorientation of institutional strategies, processes, and value creation. As described in existing scholarship, "digital transformation signifies a move away from technology adoption alone and toward a thorough reorganization of institutional strategies, processes and value generation mechanisms. Organizational processes, stakeholder interactions and service delivery are all impacted by the widespread adoption of digital technologies" (Kraus et al., 2021; Ferreira, 2024). This framing underscores the inherently transformative rather than incremental nature of digital change, implying that successful digital transformation necessitates alterations in institutional culture, organizational structure, governance, and strategic objectives.

The digital transformation of higher education comprises several interdependent facets. First, it requires the development of technological infrastructure, such as learning management systems, cloud computing, artificial intelligence applications, and big data analytics. Second, it involves process redesign, where administrative functions, student services, and academic activities are reconfigured to leverage digital capacities. Third, digital transformation necessitates cultural and organizational adaptation, as institutions must cultivate new mindsets, skills, and governance frameworks to foster digital innovation. Fourth, it entails strategic realignment, as universities aim to sustain competitiveness and relevance within increasingly digital educational landscapes (Benavides et al., 2020; Makda, 2025).

A key distinction in literature differentiates between digitization, digitalization, and digital transformation. Digitization, the conversion of analog information to digital formats, represents the foundational stage of technological adoption. Digitalization utilizes digital technologies to enhance existing processes and operations. Digital transformation, conversely, involves more profound modifications to organizational models, value generation, and institutional capacities (Kraus et al., 2021). This distinction is crucial, as many institutions have implemented digitization and digitalization without achieving comprehensive digital transformation, thereby limiting the potential benefits of their technological investments.

Recent empirical studies indicate that digital transformation in higher education is linked to enhancements in operational efficiency, student engagement, and institutional competitiveness. Wong et al. (2025) observed positive impacts of digital learning on student engagement and flexibility, particularly within institutions that have invested in extensive digital learning environments. Similarly, Pang et al. (2024) found that AI-assisted instruction improves learning experiences, contingent upon institutional preparedness and governance structures. However, Tang et al. (2025) contended that technology adoption alone does not guarantee improved educational outcomes without concurrent organizational transformation, suggesting that organizational capabilities mediate the relationship between digital investment and institutional performance.

Literature also identifies substantial obstacles to digital transformation in higher education. These include resistance to organizational change, disparities in digital access among students and staff, concerns regarding data privacy and cybersecurity, the ethical governance of artificial intelligence, and the ongoing need to develop staff digital competencies (Potemkin & Rasskazova, 2020; Hesse et al., 2022). These challenges suggest that effective digital transformation requires not only technological resources but also strong leadership, institutional readiness, and robust organizational change management capabilities.

Organizational Efficiency in Higher Education

Organizational efficiency in higher education pertains to the effective deployment of resources, technology, and administrative structures to meet institutional goals while minimizing expenditures, delays, and operational overhead. In the context of digitally transformed universities, this efficiency is observed in the degree to which digital technologies enhance administrative functions, communication channels, decision-making processes, and the delivery of institutional services (Dhameria et al., 2025; Tawfik El Sayed Elewa, 2024). This perspective frames efficiency as a multifaceted characteristic that includes both the operational and strategic aspects of an institution's performance.

Existing literature outlines several critical dimensions of organizational efficiency within higher education. Administrative process efficiency focuses on the timeliness and precision of tasks such as student registration, academic record keeping, financial management, and internal communications. Resource utilization involves the judicious allocation and application of institutional assets, encompassing financial, human, and technological components. Cost efficiency aims to lower operational expenses through digitalization, achieved by automating routine tasks and optimizing resource distribution. Decision-making speed is facilitated by prompt access to information for managerial choices, supported by real-time data and analytical tools. Staff productivity can be elevated through digital instruments and streamlined workflows. Service quality relates to the standard of services provided to students and personnel, including aspects like responsiveness, accessibility, and user satisfaction (Brdesee, 2021; Dhameria et al., 2025).

A significant body of research indicates that digital technologies contribute to improved organizational efficiency in higher education. Evidence shows that automating administrative tasks reduces errors and costs, while decisions informed by data enhance resource allocation and strategic planning (Obasi, 2025; Tawfik El Sayed Elewa, 2024). Cloud computing and integrated information systems facilitate real-time data access and cross-departmental collaboration, thereby improving institutional agility and coordination (Khatir & Madani, 2024). Learning management systems simplifies course management, grading, and student interactions, allowing academic personnel to dedicate more time to teaching and research.

A nuanced comprehension of organisational efficiency requires recognising that efficiency gains do not necessarily distribute evenly across institutional functions or departments. Research suggests that the gains in administrative efficiency from digital technologies can be substantial, but the academic benefits, in terms of teaching and research, tend to be more modest and dependent on complementary investments in staff development and pedagogical innovation (Tang et al., 2025). The uneven distribution of benefits indicates the importance of regarding efficiency as a multidimensional construct, not a single aggregate measure.

Academic Excellence in Higher Education

Academic excellence in higher education is defined as the degree to which tertiary institutions attain superior outcomes in education, research, and student development through effective teaching, learning, innovation, and

institutional performance. In the context of digital transformation, academic excellence encompasses technology-enabled learning environments, improved student engagement, research output, and institutional competitiveness beyond traditional academic achievements (Maiya & Aithal, 2023; Mohamed Hashim et al., 2022). This perspective acknowledges the multifaceted nature of academic performance in current higher education settings.

Several interconnected dimensions contribute to academic excellence. Teaching quality involves the efficacy of teaching, augmented by digital technologies, encompassing pedagogical innovation, student-centered learning strategies, and the integration of technology into curriculum delivery. Student learning outcomes focus on advancements in knowledge, skills, and competencies, assessed through academic performance, skill acquisition, and critical thinking abilities. Student satisfaction measures students' perceptions of educational quality and their digital learning experiences, including engagement, support services, and the overall learning environment. Graduate employability pertains to graduates' readiness for the workforce and industry demands, focusing on the cultivation of pertinent skills and competencies. Research productivity includes publications, innovation initiatives, collaborative research efforts, and knowledge generation (Maiya & Aithal, 2023; Antoninis et al., 2023).

Digital transformation has opened new avenues for enhancing academic excellence via innovative pedagogical methods such as blended learning, flipped classrooms, and fully online educational platforms. These approaches can potentially elevate student engagement, learning outcomes, and educational accessibility (Wong et al., 2025; Pang et al., 2024). Learning analytics facilitates personalized education, the early identification of students at risk of falling behind, and data-driven improvements in pedagogy (Kleimola & Leppisaari, 2022). Artificial intelligence applications offer support for adaptive learning, intelligent tutoring systems, and automated assessments, which may improve educational quality and efficiency.

The interplay of digital technologies and academic excellence is mediated by a number of factors including pedagogical design, faculty professional development, institutional support structures, and student characteristics (Tang et al., 2025). For instance, learning analytics applications have demonstrated potential in enhancing student engagement and identifying at-risk students, yet their efficacy depends on the quality of implementation, faculty training, and institutional data governance frameworks (Kleimola & Leppisaari, 2022). Likewise, AI-assisted instruction has the potential to improve learning experiences, but its advantages seem contingent on institutional readiness and suitable governance structures (Pang et al., 2024).

A critical perspective on academic excellence recognises that the pursuit of excellence is not value-free but rather embodies specific assumptions about the purposes and values of higher education. The emphasis on measurable outcomes such as graduate employability or research productivity may overshadow other important dimensions of academic excellence, such as intellectual development, civic engagement and lifelong learning (Antoninis et al., 2023). These tensions are amplified by the digital transformation of higher education, as the technologies that are used to measure and improve performance are also shaped by values and priorities.

Digital Transformation in Global Financial Hubs

The pace and scope of digital transformation in higher education vary greatly across global financial hubs, reflecting national digital strategies, government policies, institutional governance, and investment in technological infrastructure. Digital transformation is an institutional priority for universities in highly competitive and innovation-driven ecosystems such as Singapore, Hong Kong, London and New York. However, each site has its own approach to digital innovation and organisational development.

By promoting the use of digital technologies in public services, education and industry, Singapore has become one of the world's leading digital economies through the government's Smart Nation Initiative. Higher education institutions such as the National University of Singapore and Nanyang Technological University have invested heavily in artificial intelligence, cloud computing, learning analytics, digital twins and smart campus technologies. These efforts enable individualised instruction, predictive analytics for students, automated administrative processes, and data-driven decision-making within institutions (Gaftandzhieva et al., 2023). Research shows that digital transformation in Singaporean universities has increased operational efficiency

(Nguyen-Anh et al., 2023), while also improving research collaboration and student learning outcomes. But scholars stress that long-term success depends on effective digital leadership, institutional readiness and continuous investment in staff digital competencies.

Hong Kong's universities have accelerated digital transformation with extensive use of learning management systems, artificial intelligence, virtual learning environments and smart campus initiatives. Recent empirical studies suggest that digital technologies enhance student engagement, academic flexibility and administrative efficiency. Generative artificial intelligence has been adopted in universities to support teaching, research, and even academic administration (Han et al., 2025; Huang et al., 2024). However, several studies also identify important challenges, including data privacy issues, unequal digital access, ethical governance of AI, and differences in technological literacy levels among students and academic staff. Yip, Han, and Chan (2025) have documented several student-driven digital scholarship initiatives in the development of AI tools in higher education, illustrating the promise and pitfalls of student engagement in digital innovation.

The digital transformation in London universities has been mainly through institutional digital strategies that have focused on hybrid learning, artificial intelligence, cloud-based collaboration and digital research infrastructure. Institutions like University College London, King's College London and Imperial College London have increased their investments in learning analytics, virtual laboratories, digital assessment systems and data-informed institutional management (Hesse et al., 2022). Research shows that these technologies improve educational flexibility, administrative responsiveness and foster international collaboration. However, scholars point to enduring issues around cybersecurity, institutional resistance to change, digital inclusion, and sustainability of digital transformation over the long term.

New York's universities are among the most technologically advanced higher education ecosystems in the world. Examples include the use of artificial intelligence, cloud computing, digital research platforms, adaptive learning technologies and enterprise-wide information systems to enhance teaching, research and institutional management in institutions such as New York University and Columbia University. Recent evidence shows that digital transformation has increased operational agility, improved interdisciplinary collaboration and enhanced student learning experiences (Ryzheva et al., 2024). But researchers also cite concerns over digital governance, the ethical use of artificial intelligence, cybersecurity risks and increasing financial pressure to fund sophisticated digital infrastructures.

A systematic comparison across the four global financial hubs shows that whilst there are common trends – including substantial investment in digital infrastructure, adoption of AI and learning analytics, and a focus on personalised and flexible learning – there is significant variation in the pace, scope and outcomes of digital transformation. This variation can be explained by a number of explanatory mechanisms, including differences in national digital strategies, institutional governance structures, funding models and cultural contexts.

The specificities of each hub suggest that the relationship between digital transformation and institutional performance is strongly moderated by contextual factors. For example, the cultural emphasis on educational achievement in Singapore and Hong Kong may amplify the importance of digital technologies for academic outcomes, while the hyper-competitive university market in the United States may lead to particular focus on efficiency and institutional competitiveness. When interpreting the findings and drawing conclusions about the effectiveness of the digital transformation initiatives, these contextual factors need to be considered.

Theoretical Framework and Conceptual Model

Dynamic Capabilities Theory

A powerful theoretical lens to understand how organisations develop and sustain competitive advantage in a rapidly changing environment is provided by the Dynamic Capabilities Theory (Teece et al., 2023). DCT suggests that competitive advantage is a function of the firm's ability to “integrate, build and reconfigure internal and external competences to address rapidly changing environments” (Teece et al., 1997, p. 516). This capability is built on three core activities: sensing, seizing and transforming.

Sensing is the process of identifying opportunities and threats in the external environment and requires organisations to develop scanning mechanisms and interpretive processes that pick-up signals of change before they are widely recognised. In higher education, sensing means tracking technological developments, regulatory changes, competition, and stakeholder expectations. Digital transformation initiatives can also provide enhanced sensing capabilities through data analytics, stakeholder feedback systems, and environmental scanning technologies.

Seizing is about mobilising resources to capture value from identified opportunities. For this, decision-making processes need to be in place that can effectively allocate assets and implement appropriate business models. Seizing in higher education is all about making strategic investments in digital infrastructure, building digital capabilities and putting digital learning and administrative systems in place. Successful capture requires commitment from leadership, resources and organisational alignment.

Transforming is the continuous renewal and reconfiguration of assets to keep up with changing environmental conditions, which requires organisational flexibility and learning capabilities. Transformation in higher education involves organisational redesign, cultural change and continuous improvement of digital capabilities. This may involve reorganisation of administrative procedures, updating of academic curricula, enhancement of personnel skills, and modification of institutional policies.

Dynamic Capabilities Theory can be tautological, defining capabilities by the outcomes they explain, and was designed for profit-seeking firms, not higher education with its conflicting objectives. These weaknesses suggest complementing it with institutional theory (examining isomorphic pressures) and sociomaterial perspectives (technology-social entanglement) for a comprehensive understanding of digital transformation in universities.

The Dynamic Capabilities Theory is particularly suitable to the present study, as it stresses the organisational processes through which the technology investments translate into performance outcomes. Digital technologies do not necessarily lead to competitive advantage, but potential sources of value. Instead, value creation is a function of an organization's ability to sense opportunities, seize them through strategic actions, and transform to maintain advantages over time. That perspective helps explain why some universities enjoy substantial rewards from digital transformation, while others see modest returns on their technology investments.

Conceptual Framework

The study conceptualises an integrated framework based on the review of literature and dynamic capabilities theory to examine the relationships between digital transformation, organisational efficiency and academic excellence in tertiary education institutions located in global financial hubs. The framework hypothesises the influence of digital transformation on organisational efficiency and academic excellence through different pathways, and organisational efficiency as a mediating mechanism.

The independent variable in the framework is digital transformation. Digital transformation is defined as the strategic adoption and integration of digital technologies across the functions of an institution. This includes technology infrastructure, digital processes, organisational culture and strategic re-positioning. The digital transformation is expected to influence the efficiency of organization and academic excellence directly.

Organisational efficiency is considered a mediating variable, which refers to the degree to which digital technologies improve administrative performance, utilisation of resources, decision-making, and service quality. Organisational efficiency is believed to mediate the relationship between digital transformation and academic excellence. This is because enhanced operational efficiency enables institutions to better allocate funds to academic activities, reduce administrative burdens on faculty, and enhance student experience.

Academic excellence is the dependent variable. Academic excellence is defined by teaching quality, student learning outcomes, student satisfaction, graduate employability and research productivity. The direct effects of digital transformation (better teaching methods and learning technologies) and the indirect effects mediated by organisational efficiency are hypothesised to influence academic excellence.

The model also includes moderating variables that are hypothesised to influence the strength and direction of these relationships. As a stage of digital transformation implementation, digital maturity is expected to positively moderate the relationship between digital transformation and organisational efficiency, because digitally mature institutions have more capabilities to convert technological investment into operational improvements. Leadership support (strategic commitment, resource allocation and change management) is expected to positively moderate the relationship between digital transformation and organisational efficiency as leadership commitment is crucial to overcome resistance and mobilise resources.

Lastly, the framework recognises the significance of the contextual factors such as country, type of institution, size of institution and years of digital transformation experience. These factors are controlled by considering institutional and country differences that might affect the relationships between the core constructs.

Research Hypotheses

The following research hypotheses are presented on the conceptual framework and theoretical bases:

H₁: Digital transformation has a Significant and positive effect on organisational efficiency. This hypothesis reflects the expectation that the universities that adopt and integrate digital technologies will see improvements in terms of administrative performance, utilisation of resources, decision- making speed and service quality.

H₂: A positive and significant impact of digital transformation on academic excellence. This hypothesis is based on the expectation that digital technologies could directly improve the quality of teaching, the learning outcomes of students and the productivity of research, through innovative pedagogical approaches and improved learning environments.

H₃: Organisational efficiency has a significant positive impact on academic excellence. This hypothesis relates to the expectation that improved operational efficiency will enable institutions to allocate funds more effectively to academic activities and improve educational quality.

H₄: The relationship between digital transformation and academic excellence is mediated by organisational efficiency. This hypothesis assumes that digital transformation has a direct and indirect effect on academic excellence via improved organisational efficiency. Organisational efficiency is a channel through which digital investments are transformed into improvements in educational quality.

H₅: The impact of digital transformation on organisational efficiency varies significantly among global financial centers. This hypothesis captures the expectation that national policies, institutional governance and contextual factors in Singapore, Hong Kong, London and New York shape the effectiveness of digital transformation initiatives.

H₆: Digital transformation and academic excellence differ among global financial centers. This hypothesis is the expectation that contextual differences affect how digital transformation translates into academic outcomes.

H₇: Digital maturity moderates positively the relation between digital transformation and organisational efficiency. This hypothesis captures the expectation that institutions with more advanced digital capabilities realise greater efficiency gains from digital transformation initiatives.

H₈: Leadership support has a positive moderating effect on the relationship between digital transformation and organisational efficiency. This hypothesis means that the engagement of strong leadership can improve the effectiveness of digital transformation in enhancing the efficiency of an organization.

DISCUSSION

Theoretical Contributions

This conceptual review makes an important contribution to the literature on digital transformation in higher education. First, it makes a theoretical contribution to the understanding of the mechanisms through which digital

transformation creates institutional value, by proposing organisational efficiency as a mediating mechanism between digital initiatives and academic outcomes. Much of the existing research has considered operational and academic outcomes separately, but this review offers an integrated theoretical account which addresses the interrelationships between these dimensions of institutional performance. This contribution is important because it suggests that, at least partially, improvements in organisational efficiency are a prerequisite for the benefits of digital transformation for academic excellence.

Second, the review uses Dynamic Capabilities Theory in higher education and presents a theoretical framework to explain how universities develop and leverage digital capabilities to enhance their performance. The review conceptualises digital transformation as a process of sensing, seizing and transforming, which emphasises the dynamic and capability-based nature of digital change. This perspective goes beyond technology-oriented accounts to highlight the organisational processes of embedding digital technologies into institutional strategies and operations.

Third, the review advances the understanding of institutional and contextual factors influencing digital transformation outcomes by exploring variations across global financial centers. The comparison reveals common patterns across the sites, but also distinctive approaches reflecting differences in national policies, institutional governance and cultural context. This implies that contextual factors moderate the relation between digital transformation and institutional performance, with theoretical and practical implications.

Fourth, the review presents testable hypotheses that can serve as a base for future empirical research. These hypothesised relationships, based on well-established theory and empirical evidence, guide the quantitative investigation of digital transformation in higher education. The proposed conceptual model, which includes direct, indirect and moderated relationships, provides a holistic framework to understand the complex dynamics of digital change in universities.

The theoretical contributions of this review are to be read with attention to its boundary conditions. However, the proposed framework assumes that universities act as relatively rational actors with clear strategic objectives, which may not always be the case in institutions where conflicting stakeholder interests or ambiguous goals exist. Moreover, the framework focuses on organizational-level outcomes and may not capture the full complexity of individual-level experiences and outcomes in relation to digital transformation. Future work should explore the boundary conditions of the proposed framework and in which settings it might need to be modified.

Practical Implications

Several specific action steps for university leaders can operationalise the practical implications of this review:

- (a) Develop comprehensive digital transformation strategies -- Instead of looking at digital transformation as a series of distinct technology projects, institutions need to develop comprehensive strategies that encompass infrastructure, processes, culture, and capabilities. This strategic change (Hanelt et al., 2021) should be aligned with institutional mission and strategic goals and should include clear milestones and metrics for evaluation.
- (b) Invest in efficiency university leaders -- They need to understand that investments in digital technologies that improve administrative efficiency can create conditions for improved academic outcomes through freeing resources and reducing administrative burden. This means that efficiency gains are not ends in themselves but means to improve the quality of education and the productivity of research.
- (c) Build digital capabilities across all levels -- Successful digital transformation requires digital capabilities at multiple levels, individual, organisational and institutional. This means training staff and faculty in digital skills, building capabilities in change management, and establishing governance structures to encourage digital innovation. Technology investments need to be accompanied by an emphasis on professional development programs and training initiatives.

(d) Take contextually sensitive approaches -- The institutional contexts, resources, and capabilities vary widely. Hence, a one-size-fits-all approach to digital transformation is unlikely to work. Strategies must be adapted to the institutional circumstances considering national policies, funding models, institutional culture and stakeholder expectations.

You must expect implementation challenges and deal with them actively. This might include resistance to change, skills gaps, resource constraints and concerns around data privacy and security. Effective change management strategies, such as straightforward communication, stakeholder engagement, and phased implementation, are needed to overcome these challenges.

Methodological Considerations

This conceptual review also has implications for research methods in the study of digital transformation in higher education. The review suggests that there is a need for integrated research designs that study organisational and academic outcomes together, because current research studies these outcomes separately. Quantitative approaches such as structural equation modelling could allow for the simultaneous testing of direct, indirect and moderated relationships between digital transformation, organisational efficiency and academic excellence.

Secondly, the review emphasises the necessity of comparative research designs that consider digital transformation across different institutional and national contexts. The differences found between global financial centers underscore the importance of context in determining the outcomes of digital transformation, suggesting that research focused on a single institution or country may have limited applicability. Multi-group analyses could enable a systematic comparison of relationships across contexts, which could be useful to highlight factors that moderate the effectiveness of digital transformation initiatives.

Third, the review points to a need for more rigorous measurement of digital transformation, organisational efficiency, and academic excellence. Many existing studies use single-item or ad hoc measures that may not represent the multidimensional nature of these constructs. Developing and validating multi-item scales with established psychometric properties would strengthen empirical research in this area.

Mixed methods approaches could supplement quantitative studies by offering richer insights into the processes and mechanisms driving the observed relationships. Interviews with institutional leaders and stakeholders may provide insight into decision-making processes and implementation challenges. Qualitative case studies of high- and low-performing institutions may shed light on how contextual factors shape digital transformation outcomes.

Gaps and Directions for Future Research

Although this review has contributed, there are still gaps that need to be further investigated. Second, the paper proposes a conceptual model that claims a causal relationship between digital transformation, organisational efficiency, and academic excellence, but the review is based on theoretical reasoning and existing empirical evidence and not on primary data. Future studies should empirically test the proposed relationships using rigorous quantitative methods such as structural equation modelling and multi-group analysis.

Second, the review identifies variations among global financial centres but does not systematically analyse the impact of contextual factors on the outcomes of digital transformation. Future research should explore the role of national policies, institutional governance, funding models, and cultural factors as moderators of the digital transformation-institutional performance link. This would enable a deeper understanding of context-dependent effects and inform strategy formulation in different national settings.

Third, the review is concerned with outcomes at the organisational level, examining efficiency and excellence at the institutional level. But digital transformation also has huge implications at the individual level, shaping the experiences of students, faculty, and administrators. Future research should examine the impact of digital transformation on individual outcomes such as student learning, faculty satisfaction, and staff productivity, and how individual level effects accumulate to organisational level outcomes.

Fourth, possible negative impacts of digital transformation, like digital inequality, data privacy issues, and replacement of traditional academic roles are not considered in the review. Future research should investigate these potential negative effects and the ways in which institutions can minimise these effects while maximising the benefits of digital transformation.

Fifth, the review is cross-sectional, looking at relationships at one point in time. However, digital transformation is a process that evolves over time and its impacts may change as technologies mature and organisations adapt. Longitudinal research designs that follow institutions over time would shed light on the temporal dynamics of digital transformation and the sustainability of its effects.

Finally, these research directions are interrelated and could be pursued in integrated research programs. For example, longitudinal studies could include comparative aspects, following several institutions over time, while multi-level analyses could be combined with contextual studies to explore how individual, organisational and contextual factors interact to produce digital transformation outcomes.

CONCLUSION

This conceptual review has discussed the links between digital transformation, organisational efficiency, and academic excellence in tertiary education institutions located in global financial hubs. The review has developed an integrated conceptual framework based on the Dynamic Capabilities Theory as a theoretical model where organisational efficiency acts as a mediating mechanism between digital transformation initiatives and academic outcomes.

The analysis concludes that digital transformation in higher education is composed of multiple interlinked dimensions: technological infrastructure, process transformation, cultural and organisational change, and strategic repositioning. Digital transformation can improve organisational efficiency and academic excellence, but the degree and nature of these improvements are contingent on organisational capacity, institutional readiness, leadership support, and contextual factors. The comparison across countries of Singapore, Hong Kong, London and New York shows common patterns and distinctive approaches, hinting that contextual factors shape the relationship between digital transformation and institutional performance.

The implications of this review for the future of higher education are important. Digital transformation has emerged as a strategic priority with direct implications for institutional viability and success as universities worldwide face mounting pressures to enhance efficiency, quality and competitiveness. The theoretical framework presented in this review offers directions for understanding how digital investments can be leveraged for maximum institutional benefit, while the research gaps identified suggest avenues of scholarly inquiry that can inform evidence-based strategy and policy.

As we look to the future, the digital transformation of higher education will only become more advanced and more integrated in the years to come. The coming together of artificial intelligence, learning analytics and data-driven institutional management heralds the coming of more personalised, responsive and efficient educational systems. At the same time, the challenges of digital inequality, data governance and ethical use of technology will need to be carefully considered. The institutions that will thrive in this environment will be those that will combine technological investment and the development of organisational capability, strategic leadership and sensitivity to contextual factors.

This review calls on researchers to empirically test the proposed framework by studying the mechanisms by which digital transformation influences institutional performance in various contexts. It urges institutional leaders to develop holistic and context-sensitive approaches that address operational efficiency and academic excellence. And it is calling on policymakers to put in place the right conditions for digital transformation, while tackling the challenges of fairness, privacy and ethics. Through collaboration in these domains, higher education can harness the promise of digital transformation to support individual development, economic productivity, and social wellbeing.

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