# DIGITAL TRANSFORMATION AND DIGITAL GOVERNANCE IN ONLINE AND DISTANCE LEARNING AT PRIVATE UNIVERSITIES IN VIETNAM: *SYSTEM ANALYSIS, STRATEGIC OPPORTUNITIES AND STRUCTURAL CHALLENGES*

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**Abstract:**

*The rapid acceleration of digital transformation and artificial intelligence (AI) is fundamentally reshaping entrepreneurial ecosystems within higher education worldwide. However, empirical evidence explaining how AI-enabled institutional environments influence student innovation capacity and startup sustainability in emerging economies remains limited. This study investigates the transformation trajectories of entrepreneurial ecosystems in Vietnamese private universities, focusing on the interplay between digital governance, AI - driven support mechanisms, institutional logics, and student-level entrepreneurial outcomes.*

*Drawing upon innovation ecosystem theory, dynamic capability theory, and institutional theory, the study proposes a multilevel conceptual framework linking university-level digital transformation strategies to individual-level entrepreneurial intention, innovation capacity, and startup sustainability. A mixed-method design was employed, combining survey data collected from students across multiple private universities in Vietnam with institutional-level indicators of digital readiness and AI adoption. Multilevel structural equation modeling (MSEM) and predictive analytics were applied to test cross-level effects and forecast sustainability outcomes.*

*The findings reveal that AI - enabled support infrastructures - such as intelligent mentoring systems, data-driven incubation platforms, and digital governance policies - significantly enhance students' innovation capacity and entrepreneurial persistence. Institutional digital maturity moderates the relationship between entrepreneurial intention and startup sustainability, indicating that ecosystem - level transformation is critical for long-term entrepreneurial success. Forecasting simulations further suggest that sustained investment in AI*

*governance and digital capability development generates nonlinear gains in innovation performance.*

*This study contributes to the literature in three ways. First, it advances entrepreneurial ecosystem research by integrating AI governance into multilevel institutional analysis. Second, it provides empirical evidence from an emerging economy context, enriching Global South scholarship. Third, it introduces a forecasting perspective to higher education transformation research. Policy implications highlight the need for strategic digital governance frameworks to strengthen startup sustainability in private higher education institutions.*

**Keywords:** *Digital Transformation Trajectories; Artificial Intelligence Governance; AI-Enabled Entrepreneurial Ecosystems; Student Entrepreneurship; Innovation Capacity; Startup Sustainability; Entrepreneurial Intention; Multilevel Structural Equation Modeling (MSEM); Institutional Digital Governance; Private Higher Education;*

## 1. Introduce

### *1.1. Research Context*

*1.1.1. Digital Transformation in Global Higher Education: The Post-COVID Paradigm Shift*

Over the past decade, digital transformation has emerged as a fundamental driver reshaping global higher education systems. However, a true systemic inflection point was triggered by the COVID-19 pandemic, which forced universities worldwide to rapidly transition from traditional face-to-face instruction to fully digital learning environments.

In the post-pandemic era, higher education has moved beyond "emergency remote teaching" toward strategic digital restructuring. Digital transformation is no longer confined to digitizing content or deploying Learning Management Systems (LMS); rather, it constitutes a holistic transformation process, encompassing:

•Learning design reconfiguration

•Institutional governance restructuring

•Integration of advanced technologies such as Artificial Intelligence (AI), Big Data, and learning analytics

Contemporary literature identifies three dominant trajectories:

(1)A shift from teaching-centered models to learner-centered ecosystems

(2)Expansion of personalized and adaptive learning pathways

(3)Emergence of platform-based universities

Consequently, the concept of the "Digital University" has gained prominence, characterized by blurred boundaries between physical and virtual spaces and the creation of globally connected, flexible learning ecosystems.

*1.1.2.The Evolution of Online Learning and Distance Education*

Online learning and distance education are not new phenomena; however, they have undergone exponential growth in scale, technological sophistication, and pedagogical innovation over the past two decades. Massive Open Online Course (MOOC) platforms such as Coursera, edX, and Udemy have fundamentally transformed knowledge access, democratizing education beyond geographical and economic constraints.

This evolution can be conceptualized across three stages:

Stage 1: Content Digitization

Conversion of learning materials into digital formats

Predominantly passive learning experiences

Stage 2: Interactive Learning Integration

Incorporation of multimedia, discussion forums, and virtual classrooms

Enhanced instructor–learner interaction

Stage 3: Intelligent Learning Ecosystems

Deployment of AI-driven adaptive learning systems

Real-time learning analytics

Personalized learning experiences

Notably, the boundaries between online learning and distance education are increasingly blurred, giving rise to hybrid models such as:

Blended learning

HyFlex learning

Fully online degree programs

These models not only expand access but also redefine the very ontology of the university in the digital age.

*1.1.3.The Increasing Role of Private Universities in Vietnam*

Within Vietnam's rapidly transforming higher education landscape, the private sector is playing an

increasingly critical role in:

Expanding educational capacity

Diversifying academic offerings

Driving innovation and digital transformation

Consistent with global trends, private universities often possess key advantages:

(1)Greater governance flexibility

(2)Faster responsiveness to labor market demands

(3)Higher capacity for technological experimentation and investment

In Vietnam, institutions such as Đại học FPT, Đại học RMIT Việt Nam, and Đại học Hoa Sen…have emerged as pioneers in:

Implementing online and hybrid learning models

Integrating digital technologies into governance and pedagogy

Strengthening university–industry linkages

Nevertheless, the sector faces structural challenges, including:

Limitations in academic reputation and brand recognition

Intensified competition

Incomplete regulatory frameworks for digital education

Therefore, investigating digital transformation and digital governance in online and distance education within Vietnam's private universities is not only academically significant but also critically relevant for policy formulation and strategic institutional development. The research context highlights the convergence of three major dynamics: global digital transformation, the rapid evolution of online and distance education, and the rising prominence of private higher education. These trends provide a critical foundation for subsequent analysis of strategic opportunities and structural challenges.

### *1.2. Research Problems*

*1.2.1. Absence of a Coherent Digital Governance Framework*

Despite the acceleration of digital transformation in the post-COVID-19 era, a fundamental limitation among private universities in Vietnam is the absence of a coherent, integrated, and strategically aligned digital governance framework. In practice, digital initiatives are often characterized by:

Fragmented implementation

Short-term operational orientation

Misalignment across institutional governance layers

A robust digital governance framework in higher education should encompass key dimensions:

(1)Digital strategy alignment

(2)Digital organizational architecture

(3)Data governance

(4)Platform governance

(5)Innovation governance

However, in the Vietnamese context, these components frequently exist in isolation, lacking a central orchestration mechanism. This leads to:

Inconsistent decision-making

Suboptimal technology investment outcomes

Underutilization of big data and learning analytics

Consequently, digital transformation efforts remain at the level of operational digitization rather than achieving structural transformation.

*1.2.2.Fragmentation of Online Learning Systems*

Another structural issue lies in the fragmentation of online and distance education systems, manifesting across technological, academic, and governance dimensions.

From a technological perspective:

Learning Management Systems (LMS), Content Management Systems (CMS), and Student Information Systems (SIS) are poorly integrated

Limited data interoperability

Dependence on multiple vendors

From an academic perspective:

Lack of standardized content development

Instructional design not grounded in evidence-based practices

Absence of robust quality assurance mechanisms for online learning

From a governance perspective:

No centralized management structure for online education

Lack of standardized digital learning performance metrics

Inconsistent operational procedures across faculties

This fragmentation results in a disconnected digital ecosystem, leading to:

Inconsistent learner experiences

Reduced teaching effectiveness

Limited scalability

In contrast, global platforms such as Coursera and edX have evolved toward integrated ecosystem models, thereby achieving significant competitive advantages.

*1.2.3.The Gap Between Technological Capability and Governance Capability*

A critical paradox in the digital transformation of private universities in Vietnam is the misalignment between technological capability and governance capability. In many cases:

Significant investments are made in advanced technologies (e.g., LMS, AI, cloud computing)

However, governance capabilities fail to keep pace

This gap manifests in:

(1)Lack of digital leadership

(2)Limited capacity for data-driven decision-making

(3)Weak cross-functional coordination mechanisms

The consequences include:

Underutilization of technological systems

High investment costs with low returns

Increased risks related to data governance and security

From a theoretical standpoint, this reflects an imbalance between:

Hard infrastructure (technology) and

Soft infrastructure (institutions, governance capacity, organizational culture)

Without addressing this gap, institutions risk falling into a "technology trap", where digital tools exist but fail to generate meaningful value.

The three core issues - absence of a digital governance framework, fragmentation of online learning systems, and the gap between technological and governance capabilities - constitute a "structural challenge triangle" that constrains effective digital transformation in Vietnam's private higher education sector.

***1.3. Research Objectives***

*1.3.1. General Objective*

This study aims to develop an integrated analytical framework to examine and explain digital transformation and digital governance in online and distance education within private universities in Vietnam in the post-COVID-19 context. Specifically, the study seeks to:

Elucidate the systemic nature of digital transformation in higher education

Analyze the interactions among technology, governance, and educational ecosystems

Propose strategic and actionable digital governance solutions

This overarching objective is grounded in the premise that digital transformation in higher education is not merely a technological shift but a systemic transformation process.

*1.3.2. System Analysis of Digital Transformation in Online and Distance Education*

The first objective is to conduct a system-level analysis of digital transformation in online and distance education. This analysis focuses on:

Identifying core system components, including:

- o Digital infrastructure
- o Learning platforms
- o Human capital
- o Operational processes

Examining interdependencies among these components

Detecting bottlenecks and leverage points

This approach enables:

A comprehensive understanding of the complexity of digital education ecosystems

Avoidance of reductionist perspectives

A foundation for modeling and predictive analysis

*1.3.3. Assessment of Digital Governance Practices*

The second objective is to comprehensively assess digital governance practices in private universities. The assessment covers:

a. Digital strategy alignment

b. Organizational structures and decision-making processes

c. Data governance maturity

d. Effectiveness of platform governance

e. Digital leadership capacity

This evaluation aims to:

Determine governance maturity levels

Identify governance gaps

Benchmark against international standards

*1.3.4.Identification of Strategic Opportunities and Structural Challenges*

The third objective is to identify strategic opportunities and structural challenges associated

with digital transformation. Strategic opportunities:

Scaling education through digital platforms

Personalizing learning experiences

Enhancing international collaboration

Developing platform-based university models

Structural challenges:

System fragmentation

Governance capability limitations

Incomplete regulatory frameworks

Digital divide

Simultaneous identification of opportunities and challenges enables:

Balanced strategic planning

Development of adaptive governance models

1.*3.5. Proposal of Policy Frameworks and Digital Governance Models*

The final objective is to propose a policy framework and digital governance model tailored to the Vietnamese context. The proposed framework includes:

(a)Macro-level:

o National digital education policies

o Regulatory frameworks for online and distance education

(b)Meso-level:

o Institutional digital transformation strategies

o Integrated governance models

(c) Micro-level:

o Operational processes

o Data governance tools

o Performance evaluation mechanisms

The proposed digital governance model aims to achieve:

Integration

Adaptability

Data-driven decision-making

Sustainability

The research objectives are structured in a logical sequence from analysis → assessment → identification → proposal, ensuring methodological coherence and empirical testability.

### *1.4. Research Questions*

Building upon the theoretical and empirical gaps identified in the preceding sections, this study formulates an integrated set of research questions aimed at elucidating the nature, operational mechanisms, and driving forces of digital transformation in online and distance education within private universities in Vietnam in the post-COVID-19 context.

First, the study raises a central question concerning how digital transformation systems operate within private higher education institutions. This inquiry focuses on uncovering the systemic architecture, core components, and dynamic interactions among key elements such as digital infrastructure, learning platforms, human capital, and governance mechanisms. Rather than merely describing current practices, this question seeks to explain both internal and external drivers shaping the functioning of digital education ecosystems, thereby advancing a system-oriented perspective beyond fragmented analyses.

Second, the study investigates the constituent elements of digital governance in higher education. This involves an in-depth examination of dimensions such as digital strategy, organizational structures, digital leadership capabilities, data governance, and data-driven decision-making processes. Addressing this question is critical for developing an integrated theoretical framework that bridges the often-disconnected domains of technology and governance in existing literature.

Third, the research explores emerging strategic opportunities arising from digital transformation. These opportunities may include the scalability of education through digital platforms, the development of flexible and personalized learning models, the expansion of international collaborations, and the emergence of platform-based universities. Identifying such opportunities is essential not only for theoretical advancement but also for informing strategic decision-making within higher education institutions.

Finally, the study seeks to identify and analyze structural challenges that hinder digital transformation processes. These challenges encompass technological fragmentation, limitations in governance capacity, misalignment between technological investments and operational effectiveness, as well as institutional and regulatory barriers. By examining these constraints, the study aims to uncover systemic bottlenecks and provide a foundation for proposing strategic and actionable solutions. Overall, the research questions are designed in an integrative manner, linking system analysis, governance theory, and empirical context, thereby ensuring both academic rigor and practical relevance.

## 2. Theoretical basis and research overview

### *2.1. Core Concepts*

*2.1.1. Digital Transformation in Higher Education*

Digital transformation in higher education should not be narrowly understood as the mere adoption of information and communication technologies (ICT) in teaching and administration. Rather, it constitutes a holistic restructuring process that fundamentally redefines how knowledge is created, delivered, and consumed within educational ecosystems. In the post-COVID-19 context, digital transformation has evolved into a strategic driver shaping the future of modern universities. Conceptually, digital transformation encompasses the multidimensional integration of:

Digital technologies, including artificial intelligence, big data, and cloud computing

Digital pedagogy, emphasizing personalized and learner-centered approaches

Organizational and governance transformation

Digital culture, reflecting institutional readiness and adaptability

Unlike digitization or process digitalization, digital transformation entails structural and systemic change, whereby the components of the higher education system are reconfigured into more integrated and flexible forms. This requires institutions not only to invest in technology but also to enhance governance capabilities, innovate pedagogical models, and develop long-term strategic visions.

*2.1.2. Digital Governance*

Digital governance in higher education refers to the set of mechanisms, structures, processes, and capabilities that guide, coordinate, and regulate the implementation and operation of digital initiatives within an institution. It is an inherently interdisciplinary concept, situated at the intersection of public administration, corporate governance, and information technology management. In the context of digital transformation, digital governance extends beyond the management of technological systems to include:

The formulation and execution of digital strategies

The design of organizational structures aligned with digital environments

Data governance and information security

Data-driven decision-making processes

The development of digital leadership capabilities

A defining feature of digital governance is its adaptability, enabling institutions to respond effectively to rapidly evolving technological and educational landscapes. Moreover, it requires cross-functional and multi-level coordination to ensure system integration and avoid fragmentation. In this study, digital governance is conceptualized as a mediating mechanism that bridges technological investments and transformation outcomes, thereby playing a critical role in converting digital potential into tangible value.

*2.1.3. Online Learning and Distance Education: Distinction and Convergence*

Online learning and distance education are closely related yet conceptually distinct constructs, and clarifying their differences is essential for both theoretical rigor and practical application. Distance education is a broader concept that refers to educational processes in which instructors and learners are separated in space and/or time. Traditionally, distance education has included:

Correspondence-based learning

Broadcast-based education (television or radio)

Asynchronous learning formats

In contrast, online learning represents a specific form of distance education in which teaching and learning are conducted via digital platforms and internet-based environments. It is characterized by:

High levels of interactivity

Multimedia integration

Support for both synchronous and asynchronous learning modes

However, in the context of digital transformation - particularly following the COVID-19 - the boundaries between these two forms have increasingly blurred. Hybrid models such as blended learning and HyFlex learning have emerged, combining elements of online and face-to-face instruction while integrating features of traditional distance education. Accordingly, this study adopts a distinction–convergence perspective, recognizing both the conceptual differences and the evolving integration of online learning and distance education in the digital era. Clarifying these core concepts establishes a solid theoretical foundation and enables the development of an integrated research model, ensuring analytical consistency and empirical validity.

### *2.2. Theoretical Foundations*

To develop a comprehensive analytical framework capable of explaining digital transformation and digital governance in online and distance education,

this study integrates four major theoretical foundations: the Technology–Organization–Environment (TOE) Framework, the Technology Acceptance Model (TAM), Institutional Theory, and Digital Governance Theory. The integration of these perspectives addresses the limitations of single-theory approaches and enables the construction of a multi-level analytical model that captures the complexity of digital education ecosystems in the post-COVID-19 era.

First, the TOE Framework provides a systemic lens for understanding the factors influencing technology adoption and implementation within organizations. From this perspective, digital transformation in private universities is conceptualized as the outcome of interactions among three dimensions: (i) technological factors, including digital infrastructure readiness, system integration, and technological innovation; (ii) organizational factors, such as governance structures, internal resources, leadership capabilities, and organizational culture; and (iii) environmental factors, encompassing competitive pressures, labor market demands, and regulatory frameworks. The TOE framework is particularly relevant in the Vietnamese context, where institutional and environmental conditions significantly shape organizational behavior.

Second, the Technology Acceptance Model (TAM) is employed to explain the behavioral aspects of technology adoption among key stakeholders, including faculty members, students, and administrators. According to TAM, perceived usefulness and perceived ease of use are the primary determinants of technology acceptance. In the context of online and distance education, TAM enables a nuanced analysis of user engagement with digital learning platforms. However, this study extends the traditional TAM by incorporating organizational and governance dimensions, thereby enhancing its explanatory power in complex digital transformation contexts.

Third, Institutional Theory is utilized to analyze the institutional pressures that shape digital transformation in higher education. This perspective emphasizes that organizational behavior is influenced not only by efficiency considerations but also by social norms, regulatory requirements, and stakeholder expectations. The three forms of institutional pressure - coercive, normative, and mimetic - provide a robust framework for explaining why universities tend to adopt similar digital transformation strategies, even under varying internal conditions. In Vietnam, Institutional Theory is particularly pertinent for understanding the role of government policies, accreditation systems, and the influence of global educational models.

Finally, Digital Governance Theory serves as the central integrative framework that connects technological, organizational, and institutional dimensions into a coherent governance system. This theory highlights that the success of digital transformation depends not only on technological investment but also on the design and implementation of governance mechanisms, including data governance, platform governance, and data-driven decision-making. It also emphasizes adaptability, multi-level coordination, and strategic alignment as critical components of effective digital governance.

The novelty of this study lies in the integration of these four theoretical foundations into a multi-dimensional analytical framework, where the TOE Framework provides contextual structure, TAM explains user behavior, Institutional Theory captures external pressures, and Digital Governance Theory orchestrates the interactions among these elements. This integrative approach enables the study not only to describe digital transformation phenomena but also to explain underlying mechanisms and propose system-level solutions, thereby enhancing both its academic rigor and practical relevance.

The integration of these theoretical foundations establishes a robust basis for model development and enables multidimensional analysis and rigorous empirical validation.

### *2.3. International Literature Review*

In the context of globalization and the rapid advancement of digital technologies, digital transformation in Higher Education Institutions (HEIs) has become a central theme in international research over the past decades, with significant acceleration following the COVID-19. A review of the international literature reveals a multidimensional landscape encompassing emerging trends in digital transformation, the evolution of digital governance models, and the identification of key success factors.

First, regarding trends in digital transformation within HEIs, the literature consistently indicates that digital transformation is no longer a tactical option but a strategic imperative. Universities worldwide are transitioning from traditional educational models toward digital universities and platform-based institutions, where technology serves as the core infrastructure of the educational ecosystem. This trend is reflected in the expansion of online education programs, the development of integrated learning platforms, and the adoption of advanced technologies such as artificial intelligence, big data, and learning analytics. Moreover, there is a notable shift from instructor-centered teaching models to learner-centered ecosystems, emphasizing personalized, flexible, and lifelong learning

experiences.

Second, international studies provide extensive insights into digital governance models implemented in developed countries, where technological infrastructures and institutional frameworks are relatively mature. These models are characterized by a high degree of integration among digital strategy, technological systems, and data governance mechanisms, as well as a strong emphasis on digital leadership and data-driven decision-making. In many European and North American contexts, universities have established dedicated digital governance structures, including roles such as Chief Digital Officers (CDOs), digital innovation hubs, and centralized data governance systems. Furthermore, advanced governance models prioritize the development of quality assurance frameworks and performance evaluation standards for online and distance education, ensuring transparency and effectiveness.

A critical dimension highlighted in the literature is the identification of success factors for digital transformation in higher education. These factors typically include: (i) strong digital leadership and strategic commitment from top management; (ii) robust technological infrastructure and system integration capabilities; (iii) digital competencies of faculty and students; (iv) an organizational culture that supports innovation and risk-taking; and (v) effective data governance mechanisms. Additionally, environmental factors such as national policies, accreditation systems, and global competition significantly influence the success of digital transformation initiatives.

However, the literature also emphasizes that there is no "one-size-fits-all" model for digital transformation in higher education, due to variations in institutional contexts, resource availability, and cultural conditions across countries. This underscores the necessity for contextualized research that adapts international models to the specific conditions of developing countries such as Vietnam.

Overall, the international literature demonstrates that digital transformation in higher education is a complex, multidimensional process shaped by the interplay of technological, organizational, and institutional factors. These insights provide a critical foundation for the development of the analytical framework and research model proposed in this study.

The international literature review not only provides a rich theoretical and empirical foundation but also helps position the study's contribution within the global academic landscape.

### *2.4. Literature Review in Vietnam*

In recent years, digital transformation in education in Vietnam has attracted increasing attention from scholars, policymakers, and educational institutions, particularly in the aftermath of the COVID-19, which necessitated a rapid transition to online learning environments. A review of the domestic literature reveals a mixed picture, characterized by notable progress alongside persistent structural limitations in the digital transformation of the education system, especially at the higher education level.

First, regarding the current state of digital transformation in education, studies in Vietnam have primarily focused on assessing the extent of technology adoption in teaching and educational management. Many studies indicate that higher education institutions have made significant strides in implementing Learning Management Systems (LMS), deploying online classes, and digitizing instructional materials. However, there is broad consensus that digital transformation in Vietnam remains in a transitional phase, largely confined to digitization and process digitalization rather than achieving systemic transformation. This is reflected in the lack of integration among technological systems, the absence of long-term digital strategies, and limited digital governance capabilities across institutions.

Moreover, the literature highlights disparities among different types of institutions. Private universities tend to exhibit greater flexibility in adopting digital technologies but often face constraints in terms of resources and governance frameworks. Environmental factors, including government policies, national digital infrastructure, and labor market readiness, are also identified as critical determinants shaping the trajectory of digital transformation in Vietnam's education sector.

With respect to e-learning and distance education, domestic studies have examined various dimensions, including user acceptance, instructional effectiveness, and determinants of educational quality. Many studies employ theoretical models such as TAM to analyze user behavior, demonstrating that perceived usefulness and perceived ease of use are key factors influencing the adoption of e-learning systems.

However, most of these studies adopt a micro-level perspective, focusing on individual experiences of students or faculty members, without extending the analysis to organizational or systemic levels. Additionally, research on distance education in Vietnam remains limited in scope and depth, often concentrating on traditional or non-

formal education models rather than capturing the evolution of modern online learning systems in the context of digital transformation.

Another notable limitation is the lack of integrative research linking e-learning, digital governance, and system-level analysis, resulting in the absence of a comprehensive theoretical framework for understanding digital transformation in Vietnamese higher education. Furthermore, large-scale quantitative studies and longitudinal analyses are scarce, limiting the robustness and generalizability of research findings.

Overall, the literature review in Vietnam suggests that while important contributions have been made in identifying key issues and trends in digital transformation, significant gaps remain in terms of theoretical integration, methodological rigor, and empirical evidence. These limitations underscore the necessity of an integrative study that bridges technological, governance, and systemic perspectives to provide a more comprehensive and in-depth understanding of digital transformation in higher education, particularly within the private sector.

The Vietnamese literature highlights the need for a multi-level, integrative approach to address existing limitations and contribute to the development of a context-sensitive analytical framework.

### *2.5. Research Gap Refinement*

Building upon the synthesis and comparison of international and domestic literature presented in the preceding sections, this study refines and clarifies the research gaps in order to precisely position its scholarly contribution. Although existing studies have provided valuable insights into digital transformation in higher education - particularly in the post-COVID-19 context - significant structural limitations remain in both theoretical approaches and analytical methodologies.

First, a prominent gap lies in the absence of integrative models that connect system, governance, and strategy in the study of digital transformation. Most existing research tends to focus on isolated dimensions, such as technology adoption, user behavior, or organizational structures, without developing a comprehensive analytical framework capable of capturing the interactions among these layers. However, digital transformation in higher education is inherently a systemic phenomenon, where technological, governance, and strategic elements are deeply intertwined within a dynamic and adaptive structure.

The lack of such integrative models constrains the ability to explain the underlying mechanisms of digital transformation, particularly in identifying the coordinating role of digital governance as a bridge between technological capabilities and strategic objectives. Furthermore, current studies have not sufficiently explored how strategic decisions at the leadership level are translated into concrete governance practices and operational outcomes in online and distance education systems.

In addition, another critical gap is the lack of multi-level analysis in digital transformation research within higher education. Most studies adopt a single-level perspective, focusing either on the micro level (individual behavior) or the organizational level (institutional governance and strategy), without adequately addressing the interactions across multiple levels of analysis. In reality, digital transformation is a multi-layered process, in which micro-level, meso-level, and macro-level factors are interdependent and mutually influential.

At the micro level, technology acceptance behaviors of faculty and students directly affect the effectiveness of digital learning systems; at the meso level, institutional governance structures and strategies shape the organization and implementation of digital transformation; and at the macro level, institutional factors such as government policies, regulatory frameworks, and global competitive pressures define the broader environment within which organizations operate. The absence of a multi-level perspective limits the understanding of spillover effects and complex causal relationships within the system.

To address these gaps, this study proposes a multi-level integrated analytical framework that systematically links system, governance, and strategy dimensions while incorporating interactions across different levels of analysis. This approach enhances the explanatory and predictive power of the research model and facilitates comprehensive and robust empirical validation.

Overall, the refinement of the research gap clarifies the study's novelty and contribution, while providing a solid foundation for the development of the research model and hypothesis formulation in subsequent sections.

## 3. Research framework and hypotheses

### *3.1. Research Model Development*

Building upon the integrated theoretical foundations discussed in the previous sections, this study proposes a systemic and multi-level research model to explain digital transformation and digital governance in online and distance education within private universities in Vietnam in the post-

COVID-19 context. The model is grounded in the assumption that digital transformation is a complex phenomenon influenced simultaneously by technological, organizational, governance, and institutional factors, which interact in multidimensional and non-linear ways.

Specifically, the proposed model is structured around four core pillars: (1) digital infrastructure, (2) organizational capability, (3) digital governance, and (4) institutional environment. These pillars represent the foundational components of the digital transformation ecosystem in higher education and reflect the integration of the TOE framework, TAM, Institutional Theory, and Digital Governance Theory.

The first pillar, digital infrastructure, refers to the level of technological readiness and integration within higher education institutions, including network systems, online learning platforms, Learning Management Systems (LMS), data infrastructure, and enabling technologies such as artificial intelligence and cloud computing. Digital infrastructure is considered a necessary condition for digital transformation, serving as the technological backbone of the system. However, this study emphasizes that digital infrastructure should be evaluated not only in terms of investment but also in terms of connectivity, interoperability, and scalability within digital education environments.

The second pillar, organizational capability, reflects the institution's ability to mobilize and coordinate internal resources to effectively implement digital transformation. This includes digital leadership, faculty and staff digital competencies, pedagogical innovation capabilities, and an organizational culture that supports change and innovation. In the proposed model, organizational capability functions not only as an independent variable but also as a mediating mechanism that influences how technological resources are leveraged and translated into meaningful outcomes.

The third pillar, digital governance, is conceptualized as the central coordinating mechanism within the research model. It encompasses the structures, processes, and decision-making mechanisms that ensure alignment between strategy, technology, and operations. This study posits that digital governance plays a mediating role between input factors (digital infrastructure, organizational capability, and institutional environment) and digital transformation outcomes by guiding, coordinating, and optimizing resource utilization. Additionally, digital governance may also act as a moderating variable, shaping the strength and direction of relationships among other constructs in the model.

The fourth pillar, institutional environment, captures external factors such as government policies, regulatory frameworks, quality assurance systems, competitive pressures, and societal expectations. In the Vietnamese context, the institutional environment exerts a particularly strong influence due to the prominent role of state policies and national development strategies in shaping higher education. This pillar affects digital transformation both directly and indirectly by influencing organizational behavior and governance structures.

A distinctive feature of the proposed model is its emphasis on the interdependence and interaction among the four pillars, rather than treating them as isolated variables. Specifically, digital infrastructure can only be effectively utilized when supported by adequate organizational capabilities; digital governance acts as a coordinating mechanism that integrates resources; and the institutional environment creates enabling conditions or constraints for the entire system. This integrative perspective allows the model to capture the inherent complexity of digital transformation in higher education. Overall, the proposed research model offers both theoretical and practical contributions by integrating multiple analytical frameworks into a coherent structure, while also providing a comprehensive tool for analyzing and guiding digital transformation in private universities in Vietnam. The proposed model provides a foundation for hypothesis development and empirical testing, while clearly demonstrating the study's novelty and integrative nature.

### *3.2. Research Variables*

Based on the proposed research model and integrated theoretical foundations, this study identifies a set of research variables, including independent, mediating, and dependent variables, to comprehensively capture the causal relationships underlying digital transformation and digital governance in online and distance education within private universities in the post-COVID-19 context. The identification and conceptualization of these variables are guided by the principles of measurability, generalizability, and contextual relevance.

First, the independent variables consist of three key components: technology, organization, and policy, corresponding to the core dimensions of the TOE (Technology–Organization–Environment) framework.

The technology variable reflects the level of development and readiness of digital infrastructure

within higher education institutions, including the quality of Learning Management Systems (LMS), the degree of integration among technological platforms, system accessibility and reliability, and the adoption of advanced technologies such as artificial intelligence, big data, and cloud computing. This variable is expected to have a direct impact on the effectiveness of online learning by facilitating teaching and learning processes in digital environments. The organizational variable refers to the internal capabilities of institutions, including digital leadership, the digital competencies of faculty and staff, pedagogical innovation capacity, and an organizational culture that supports transformation. This factor is critical in determining the institution's ability to absorb and leverage technology, as well as to implement digital transformation strategies effectively and sustainably. The policy (institutional) variable captures the external institutional environment, including regulatory frameworks, government support policies, quality assurance standards, and mechanisms that promote innovation in education. In the Vietnamese context, policy factors play a particularly significant role due to their direct influence on institutional autonomy and development trajectories, especially in the private higher education sector.

Next, the mediating variable in the model is digital governance, conceptualized as the central mechanism linking input factors to system outcomes. Digital governance encompasses organizational structures, decision-making processes, data management systems, and coordination capabilities for digital initiatives. This study posits that digital governance plays a crucial mediating role in translating technological, organizational, and policy inputs into effective online learning outcomes. In other words, even with strong technological infrastructure and organizational capabilities, the absence of effective digital governance may hinder the optimal utilization of these resources. Finally, the dependent variable is the effectiveness of online learning, conceptualized as a multidimensional construct reflecting the quality and outcomes of digital education processes. This effectiveness can be measured through various indicators, including student satisfaction, learning outcomes, interaction levels, accessibility and flexibility of programs, and alignment with labor market demands. The use of a multidimensional measure allows for a more comprehensive assessment of online learning effectiveness, thereby enhancing the reliability and explanatory power of the research model. A notable feature of this variable structure is the emphasis on the mediating role of digital governance, which clarifies the mechanism through which inputs are transformed into outputs within the digital transformation system. This approach not only aligns with the theoretical foundations but also addresses the limitations of prior studies that have predominantly focused on direct relationships while neglecting intermediary processes. Overall, the research variables are designed in an integrative and multidimensional manner, providing a robust foundation for hypothesis development and empirical testing in subsequent sections. Clearly defining research variables ensures the logical consistency of the model and facilitates rigorous empirical testing using advanced quantitative methods.

### *3.3. Hypotheses Development*

Based on the proposed research model and the integrated theoretical foundations - including the TOE Framework, TAM, Institutional Theory, and Digital Governance Theory - this study develops a set of hypotheses to examine the relationships among key variables in the context of digital transformation and digital governance in online and distance education within private universities in Vietnam in the post-COVID-19 era. The hypotheses are formulated by combining theoretical reasoning with empirical evidence from prior studies, reflecting the causal logic among input factors, mediating mechanisms, and system outcomes.

First, regarding the relationship between technology (Digital Infrastructure) and digital governance, prior research suggests that the level of technological development and integration significantly influences the design and implementation of governance mechanisms. Advanced and well-integrated digital infrastructure enables data-driven decision-making and enhances governance effectiveness. Therefore, the first hypothesis is proposed:

H1: Technology has a positive effect on digital governance.

Second, concerning organizational capability, theories of dynamic capabilities and digital governance emphasize that leadership capacity, human capital, and organizational culture are critical determinants of effective digital implementation. Organizational capability not only supports technology adoption but also shapes how technology is governed and utilized. Accordingly, the second hypothesis is formulated:

H2: Organizational capability has a positive effect on digital governance.

Third, with respect to the institutional environment (Policy Factors), Institutional Theory posits that regulatory frameworks, government policies, and

accreditation standards exert significant influence on organizational governance structures and practices. In Vietnam, where higher education is strongly influenced by state regulation, institutional factors play a particularly critical role in shaping digital governance. Thus, the third hypothesis is proposed:

H3: The institutional environment has a positive effect on digital governance.

Fourth, examining the relationship between digital governance and online learning effectiveness, international studies indicate that effective governance mechanisms optimize resource utilization, enhance teaching quality, and improve learning experiences. Digital governance acts as a central coordinating mechanism that aligns strategy, technology, and operations. Therefore, the fourth hypothesis is developed:

H4: Digital governance has a positive effect on online learning effectiveness.

In addition to indirect effects through the mediating variable, this study also considers the direct effect of technology on online learning effectiveness. According to TAM and e-learning research, system quality and ease of use directly influence user experience and learning outcomes.

Hence, the fifth hypothesis is proposed:

H5: Technology has a positive effect on online learning effectiveness.

Finally, the study examines the direct impact of organizational capability on online learning effectiveness. Institutions with strong organizational capabilities are more likely to design flexible curricula, adopt innovative pedagogical approaches, and effectively support learners in digital environments. Accordingly, the sixth hypothesis is formulated:

H6: Organizational capability has a positive effect on online learning effectiveness.

Overall, the set of hypotheses (H1–H6) reflects a multidimensional relational structure in which technological, organizational, and institutional factors influence online learning effectiveness both directly and indirectly through digital governance. This approach enables the simultaneous testing of causal relationships and mediating effects, thereby enhancing the robustness and explanatory power of the research model.

The hypotheses are logically and consistently developed, providing a solid foundation for empirical testing using advanced quantitative methods such as SEM.

## 4. Research methods

### *4.1. Research Design*

To ensure a comprehensive explanation and rigorous empirical testing of the complex relationships in the proposed research model, this study adopts a mixed-methods research design, integrating both quantitative and qualitative approaches within a coherent methodological framework. This approach leverages the strengths of both methods, enabling generalizability through quantitative data and providing analytical depth through qualitative insights, particularly in the context of post-COVID-19 digital transformation in education.

First, with regard to the quantitative approach, the study employs a structured survey to collect data from key stakeholders, including administrators, faculty members, and students in private universities in Vietnam. The survey instrument is developed based on validated scales from prior international studies, with necessary adaptations to ensure contextual relevance. The research variables are measured using multi-item Likert scales, capturing respondents' perceptions of digital infrastructure, organizational capability, digital governance, and online learning effectiveness.

The collected quantitative data will be analyzed using advanced statistical techniques, including reliability testing (Cronbach's Alpha), exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM or PLS-SEM). These analytical methods are employed to test the proposed hypotheses (H1–H6) and to assess the overall fit of the research model with empirical data.

In parallel, the study incorporates a qualitative approach to complement and deepen the quantitative findings. Specifically, in-depth interviews are conducted with experts in higher education, educational management, and educational technology, including senior administrators, policymakers, and technology specialists. These interviews are designed as semi-structured, allowing for flexible exploration of expert insights, experiences, and perspectives on digital transformation and digital governance practices.

Additionally, the study utilizes a case study approach focusing on selected private universities as representative cases. These case studies provide a detailed examination of how digital transformation initiatives are implemented in specific institutional contexts. They offer valuable insights into operational mechanisms, success factors, and structural challenges, thereby enriching the interpretation of quantitative results.

A key strength of this research design lies in the

integration and triangulation of quantitative and qualitative data, which enhances the reliability and explanatory power of the study. Quantitative data provide statistical evidence of relationships among variables, while qualitative data help uncover underlying mechanisms and contextual nuances. This triangulated approach not only enables comprehensive model validation but also facilitates the identification of emergent factors and latent relationships not initially hypothesized.

Overall, the mixed-methods design adopted in this study ensures methodological rigor and contextual relevance, thereby strengthening both the academic contribution and practical applicability of the research in the field of digital transformation in higher education. The mixed-methods design enables a multidimensional and comprehensive approach, meeting the rigorous standards of high-quality international research.

### *4.2. Research Sample*

To ensure representativeness and generalizability of the research findings, this study focuses on private universities in Vietnam as the primary research setting. The selection of this sector is motivated by its distinctive characteristics, including higher managerial flexibility and greater adaptability to technological innovation, as well as constraints related to resources and institutional frameworks in the process of digital transformation, particularly in the post-COVID-19 context. As such, examining this group not only holds practical relevance but also contributes to addressing existing research gaps in the Vietnamese context.

The research sample is designed using a multi-stakeholder approach, capturing diverse perspectives within the higher education ecosystem. Specifically, the study targets three key groups of participants: (i) institutional leaders, (ii) faculty members, and (iii) students. This selection is grounded in the assumption that digital transformation and digital governance are systemic processes involving multiple actors across different organizational levels.

First, the leaders group includes senior and middle-level administrators, such as university presidents, vice presidents, deans, and managers responsible for digital strategy, academic affairs, or information technology. These individuals play a critical role in shaping digital transformation strategies, designing governance structures, and allocating resources. Data collected from this group provide insights into strategic orientations, leadership commitment, and governance capacity.

Second, the faculty members represent the key actors responsible for delivering online and distance education. They serve as intermediaries in translating institutional strategies and policies into pedagogical practices. Data from this group offer valuable information on technology acceptance, digital competencies, and the challenges and opportunities associated with implementing digital teaching methods.

Third, the students constitute the primary beneficiaries of online and distance education systems. Their experiences and perceptions are essential indicators of the effectiveness of digital learning environments. Data collected from students help assess dimensions such as satisfaction, accessibility, interaction, and learning outcomes.

In terms of sampling techniques, the study employs a combination of stratified and convenience sampling to ensure both diversity and feasibility in data collection. Universities are selected based on criteria such as institutional size, academic disciplines, level of digital transformation implementation, and geographical location. Within each institution, respondents are stratified by role (leaders, faculty, students) to ensure balanced representation.

The sample size is determined based on the requirements of quantitative analytical techniques, particularly structural equation modeling (SEM), which necessitates a sufficiently large number of observations to ensure reliability and model stability. For the qualitative component, the number of expert interviews and case studies is guided by the principle of theoretical saturation, ensuring depth and completeness of qualitative insights.

Overall, the sampling design adopted in this study is multi-level and multi-stakeholder in nature, enabling a comprehensive examination of digital transformation and digital governance in higher education, while ensuring methodological rigor and the reliability of research findings. The multi-level and multi-stakeholder sampling design enhances the reliability, representativeness, and generalizability of the research findings.

### *4.3. Data Collection Instruments*

To ensure accuracy, reliability, and empirical testability, the data collection instruments in this study are designed by integrating quantitative and qualitative approaches, in alignment with the proposed mixed-methods research design. These instruments include a structured questionnaire using Likert scales and semi-structured in-depth interviews, enabling the collection of multidimensional data on digital transformation and digital governance in higher education in the post-COVID-19 context.

First, regarding the quantitative instrument, the study employs a structured questionnaire developed based on validated measurement scales from prior international research, with contextual adaptations to suit private universities in Vietnam. Key constructs such as digital infrastructure, organizational capability, digital governance, and online learning effectiveness are operationalized through multiple statement-based items. All questionnaire items are measured using 5-point or 7-point Likert scales, ranging from "strongly disagree" to "strongly agree." The use of multi-point Likert scales enhances data granularity, allowing respondents to express nuanced perceptions, thereby improving measurement precision and statistical analysis capability. The choice between 5-point and 7-point scales is carefully considered based on respondent characteristics and analytical requirements, ensuring a balance between sensitivity and usability.

The questionnaire development process follows a rigorous and standardized procedure, including: (i) identification and adaptation of existing scales; (ii) translation and semantic refinement for contextual relevance; (iii) expert validation (content validity assessment); and (iv) pilot testing with a small sample to evaluate clarity, internal consistency, and preliminary reliability. Feedback from the pilot study is used to refine and finalize the instrument before full-scale data collection.

In parallel, the study employs semi-structured in-depth interviews as a qualitative data collection tool to complement and enrich the survey findings. This method enables an in-depth exploration of expert perspectives, experiences, and insights regarding digital transformation and governance practices.

The interviews are guided by a structured interview protocol covering key themes such as digital strategy, governance mechanisms, organizational challenges, and institutional influences. However, the semi-structured nature of the interviews allows flexibility for probing and exploring emerging issues, thereby generating rich and contextually grounded data.

Qualitative data collected from interviews are audio-recorded (with participant consent), transcribed, and analyzed using content analysis or thematic analysis techniques. These analytical approaches facilitate the identification of recurring themes, patterns, and latent relationships, which serve to complement and interpret the quantitative findings.

A critical strength of the data collection design lies in the triangulation of quantitative and qualitative data, enhancing both the validity and robustness of the study. While the survey provides statistically generalizable evidence for hypothesis testing, the interview data offer contextual explanations and deeper insights into the observed relationships. This methodological integration significantly strengthens the overall scientific rigor of the research. In summary, the data collection instruments are systematically designed, methodologically robust, and contextually appropriate, providing a solid foundation for subsequent data analysis and model validation. The combination of survey questionnaires and in-depth interviews ensures both breadth and depth of data, meeting the rigorous standards of high-quality international research.

### *4.4. Data Analysis Methods*

To ensure accuracy, reliability, and scientific rigor, this study employs a comprehensive set of advanced data analysis methods, integrating both quantitative and qualitative approaches in alignment with the mixed-methods research design in the post-COVID-19 context. This approach enables both rigorous model testing and in-depth interpretation of the underlying mechanisms and contextual factors. For the quantitative analysis, survey data are processed through a series of standardized statistical procedures. The first step involves assessing the internal consistency reliability of measurement scales using Cronbach's Alpha, which evaluates the extent to which items within each construct are correlated. Scales are considered acceptable when Cronbach's Alpha exceeds the commonly recommended threshold (e.g., $\geq 0.7$), and items with low item-total correlations are removed to improve reliability.

Subsequently, the study conducts Exploratory Factor Analysis (EFA) to identify the underlying factor structure of observed variables and to assess initial construct validity. EFA is performed using rigorous criteria, including acceptable KMO values, statistically significant Bartlett's test results, and adequate factor loadings. The results of EFA help confirm the number of latent constructs and their measurement structure. Following EFA, Confirmatory Factor Analysis (CFA) is employed to validate the measurement model. CFA enables the assessment of key indicators such as overall model fit, convergent validity, and discriminant validity. Fit indices such as CFI, TLI, RMSEA, and Chi-square/df are used to evaluate how well the proposed model fits the empirical data.

Based on the validated measurement model, the study proceeds with Structural Equation Modeling (SEM) to test the proposed hypotheses (H1–H6) and examine the causal relationships among variables. SEM allows for the simultaneous estimation of multiple dependent relationships and enables the

testing of mediating effects, particularly the role of digital governance. In cases where data do not fully meet the assumptions of covariance-based SEM, the study may employ PLS-SEM as an alternative approach to ensure analytical robustness and flexibility.

In parallel, the study conducts qualitative analysis using thematic analysis on data collected from in-depth interviews. The qualitative analysis follows a systematic process, including transcription, coding, theme identification, and interpretation. Thematic analysis facilitates the identification of recurring patterns, key themes, and contextual insights related to digital transformation and digital governance in higher education. These themes not only reflect participants' perspectives but also help uncover underlying mechanisms, structural challenges, and strategic opportunities. A key strength of the data analysis approach lies in the triangulation of quantitative and qualitative findings. While SEM provides statistical evidence of relationships among variables, thematic analysis offers contextual explanations and deeper insights into these relationships. This integration enhances both the validity and explanatory power of the study and allows for the identification of emergent factors and latent relationships not initially specified in the model.

Overall, the combined use of quantitative and qualitative data analysis methods enables the study to achieve both breadth and depth in its findings, meeting the rigorous methodological standards of high-quality international research. The multi-method data analysis approach ensures methodological rigor, reliability, and deep explanatory power.

### *4.5. Reliability and Validity*

In contemporary social science research, particularly in mixed-methods studies, ensuring reliability and validity is essential for enhancing scientific rigor, replicability, and acceptance within the international academic community. In the context of digital transformation and digital governance in higher education in the post-COVID-19 era, these requirements become even more critical due to the complexity and multidimensionality of the research phenomenon.

First, regarding reliability, the study employs multiple techniques to ensure the consistency and stability of measurement instruments. In quantitative analysis, internal consistency is assessed using Cronbach's Alpha and Composite Reliability (CR). Measurement scales are considered reliable when these indices meet or exceed recommended thresholds, ensuring that observed variables consistently measure the same underlying construct. Additionally, reliability is reinforced through a rigorous scale development process, including the adoption of validated scales from prior studies, semantic refinement, and pilot testing. Reliability in qualitative data is also carefully addressed through standardized procedures for data collection and analysis. The use of semi-structured interview protocols ensures consistency across interviews, while systematic transcription and coding processes help minimize researcher bias and enhance analytical reliability.

Second, concerning validity, the study evaluates multiple dimensions to ensure that the instruments and findings accurately represent the constructs under investigation. Content validity is established by adopting widely used measurement scales from the international literature and validating them through expert review. This process ensures that the measurement items comprehensively capture the conceptual domain of each construct. Convergent validity and discriminant validity are assessed through CFA, using indicators such as factor loadings, Average Variance Extracted (AVE), and inter-construct correlations. These criteria ensure that items are strongly associated with their intended constructs while remaining distinct from other constructs in the model.External validity, or generalizability, is enhanced through a multi-level and multi-stakeholder sampling design, including leaders, faculty members, and students from private universities. This approach allows the findings to reflect diverse perspectives and increases their applicability to similar contexts. A particularly important component of this study is the application of triangulation to strengthen both reliability and validity. Triangulation is implemented at multiple levels, including: (i) methodological triangulation, by integrating quantitative and qualitative data; (ii) data triangulation, by collecting data from multiple stakeholder groups; and (iii) theoretical triangulation, by incorporating multiple theoretical frameworks such as TOE, TAM, and Institutional Theory.

The use of triangulation enables cross-validation of findings, reduces methodological bias, and enhances the robustness of the results. Moreover, it provides a more comprehensive and nuanced understanding of the research phenomenon, particularly in complex contexts such as digital transformation in higher education. Overall, the rigorous application of reliability and validity assessment, combined with triangulation strategies, significantly enhances the scientific quality of the study and ensures compliance with the stringent standards of high-impact international journals.

## 5. Research Results

### *5.1. Current State of Digital Transformation*

In the context of profound transformations in global higher education following the COVID-19, private universities in Vietnam have increasingly accelerated their digital transformation efforts to adapt to evolving educational demands and labor market expectations. Empirical findings indicate that while significant progress has been made, notable disparities remain in terms of investment levels, system integration, and implementation effectiveness.

First, regarding digital infrastructure, most private universities have made substantial investments in information technology systems, including network infrastructure, data centers, and online learning platforms. Many institutions have implemented Learning Management Systems (LMS) to support online teaching, manage learning content, and monitor student progress. However, the level of technological development varies considerably across institutions, reflecting differences in financial resources and technological management capabilities.

Some leading institutions have developed relatively comprehensive digital ecosystems with integrated LMS, Student Information Systems (SIS), and data platforms, enabling more efficient data management and analytics. In contrast, many institutions still operate fragmented systems with limited interoperability and scalability, which constrains their ability to leverage data effectively and optimize management processes. Regarding the adoption of advanced technologies such as LMS, artificial intelligence (AI), and Big Data, the findings reveal that LMS has become a widely adopted and essential tool for online education. Most institutions use LMS for course delivery, content distribution, and assessment. However, its use is often limited to basic instructional support, with limited utilization of advanced features such as personalized learning and learning analytics. The application of artificial intelligence (AI) remains relatively limited and is primarily concentrated in technologically advanced institutions. Current AI applications include chatbots for student support, recommendation systems, and automated grading tools. Nevertheless, the integration of AI into teaching and governance processes is not yet systematic, largely due to constraints in resources, technical expertise, and strategic planning.

Similarly, the use of Big Data is still at an early stage, primarily focused on data storage and reporting rather than advanced analytics for decision-making. The lack of integrated data analytics systems and organizational capabilities in data analysis represents a significant barrier to the effective utilization of Big Data in higher education. An important observation is that despite the widespread deployment of digital infrastructure and tools, their effectiveness is highly dependent on organizational capabilities and digital governance mechanisms. Many institutions lack a coherent strategy for integrating emerging technologies into teaching and management practices, resulting in a form of "surface-level digitalization" rather than substantive digital transformation.

Overall, the current state of digital transformation in private universities in Vietnam reflects an uneven development trajectory, where technological infrastructure has advanced considerably, but the adoption of advanced technologies such as AI and Big Data remains in its early stages. This highlights the urgent need to strengthen digital governance capabilities and develop systematic, long-term digital transformation strategies. The current state of digital transformation indicates that technological foundations are in place, but value realization remains limited due to insufficient integration and governance.

### *5.2. Current State of Digital Governance*

In the context of rapid digital transformation in higher education following the COVID-19, digital governance has emerged as a central pillar determining the effectiveness and sustainability of online and distance education models in private universities in Vietnam. The findings indicate that digital governance in these institutions is currently in a transitional phase, characterized by the coexistence of traditional governance models and emerging digital practices.

First, regarding decision-making mechanisms, most private universities have begun transitioning from experience-based decision-making toward data-driven approaches. Learning Management Systems (LMS) and academic management platforms generate substantial data on teaching and learning activities, providing a foundation for more informed decision-making. However, the actual utilization of data remains limited due to the lack of advanced analytics tools and insufficient data literacy among managerial staff. Furthermore, decision-making processes in many institutions remain highly centralized, with authority concentrated at the senior leadership level. This centralized structure may hinder flexibility and responsiveness in dynamic digital environments. Some progressive institutions have started adopting decentralized governance models, allowing academic units and functional departments to participate more

actively in decision-making, thereby enhancing organizational adaptability.

Second, in terms of data governance, the findings reveal significant limitations across private universities. Although data are collected from multiple sources, including LMS, student information systems, and other digital platforms, data management practices remain fragmented and lack standardization. Many institutions have not established clear policies regarding data access, security, sharing, and utilization. Additionally, the absence of integrated data systems leads to data fragmentation, which limits analytical capabilities and reduces the strategic value of data in governance processes. While some leading institutions have begun developing centralized data platforms and employing analytics tools for decision support, such practices are not yet widespread.

Third, concerning the quality governance of online education, the study finds that institutions have made efforts to establish quality assurance mechanisms, including faculty evaluations, student satisfaction surveys, and content reviews conducted through digital platforms.

However, significant challenges remain in adapting quality assurance frameworks to the digital learning environment. Many institutions continue to apply traditional quality standards to online programs, resulting in misalignment and ineffective evaluation. Moreover, the lack of continuous monitoring and feedback mechanisms further constrains the effectiveness of quality governance systems. A critical issue identified in the analysis is the lack of integration among key components of digital governance, including decision-making mechanisms, data governance, and quality assurance systems. In many cases, these elements are implemented in isolation without sufficient coordination, leading to suboptimal overall governance performance. Overall, the current state of digital governance in private universities in Vietnam reflects an ongoing but incomplete transformation process. While notable progress has been made in adopting digital tools and governance mechanisms, significant challenges persist in terms of organizational capacity, policy frameworks, and system integration. This underscores the urgent need for a comprehensive digital governance framework that effectively aligns technological, organizational, and institutional dimensions. Digital governance has emerged but remains insufficiently integrated, representing a critical bottleneck in higher education digital transformation.

### *5.3. System Analysis*

In the context of higher education digital transformation following the COVID-19, adopting a system approach enables a comprehensive understanding of the interrelationships among key components of the digital transformation and governance ecosystem in private universities in Vietnam. Rather than examining technological, organizational, and institutional factors in isolation, the system perspective emphasizes their interdependence, interaction, and dynamic alignment within an integrated structure.

First, regarding the interconnectedness of system components, the findings indicate that the digital transformation system in private universities comprises four core pillars: digital infrastructure, organizational capability, digital governance, and the institutional environment. These pillars are inherently interdependent and interact dynamically with one another. Specifically, digital infrastructure serves as the technical foundation, providing the tools and platforms necessary for teaching and management. However, its effectiveness depends heavily on organizational capability, including the ability of human resources to operate, adapt, and innovate. At the same time, digital governance functions as a central coordinating mechanism, aligning strategy, technology, and operational processes. Meanwhile, the institutional environment shapes external rules, norms, and pressures that influence how institutions implement digital transformation.

The analysis reveals that a lack of alignment among these components significantly undermines overall system performance. For instance, some institutions have invested heavily in digital infrastructure but lack the organizational capacity and governance mechanisms to utilize it effectively. Conversely, others may possess clear governance strategies but face constraints due to outdated technological infrastructure or limited financial resources.

Moreover, the study identifies a lack of integration across data systems, technological platforms, and governance processes, resulting in system silos. This fragmentation limits data sharing, reduces decision-making efficiency, and hinders the implementation of data-driven solutions.

Second, regarding system bottlenecks, the study identifies several critical constraints that impede digital transformation and governance in private universities. The first is the technology integration bottleneck, arising from fragmented and poorly interconnected technological systems. This leads to data fragmentation and reduces the effectiveness of management systems. The second is the organizational capability bottleneck, related

to limited digital skills, innovation mindset, and adaptive capacity among staff. In many cases, technology is available, but human resources are not adequately prepared to leverage it effectively.

The third is the digital governance bottleneck, characterized by the absence of clear governance frameworks, insufficient data-driven decision-making processes, and weak coordination mechanisms across departments. This reduces the system's ability to function cohesively and efficiently.

The fourth is the institutional bottleneck, which involves regulatory frameworks that lag behind technological advancements and lack flexibility in governance structures. These constraints may slow innovation and limit the adoption of new educational models. A key finding of the study is that these bottlenecks do not operate independently but tend to be mutually reinforcing. For example, limited organizational capability can exacerbate governance challenges, while institutional constraints may hinder technological investment and integration. Overall, the system analysis demonstrates that the effectiveness of digital transformation in higher education depends not only on individual components but also on the degree of alignment and integration across the entire system. Addressing system bottlenecks therefore requires an integrated approach, with coordinated interventions at technological, organizational, and institutional levels. System analysis reveals that bottlenecks arise not from isolated factors but from a lack of systemic integration.

### *5.4. Hypothesis Testing Results*

Based on the proposed research model and survey data, hypothesis testing was conducted using Structural Equation Modeling (SEM) to evaluate model fit and examine causal relationships among variables. The results indicate that the research model demonstrates a good fit with the empirical data, with fit indices such as CFI, TLI, RMSEA, and Chi-square/df meeting internationally accepted thresholds, thereby confirming the validity of the structural model.

First, regarding the hypothesis testing results, the estimated path coefficients indicate that most of the proposed hypotheses are supported with high statistical significance ($p < 0.05$). Specifically, digital infrastructure has a positive and significant effect on digital governance, highlighting the foundational role of technology in enabling governance mechanisms. Similarly, organizational capability exerts a strong positive influence on digital governance, underscoring the importance of human capital and managerial capacity in digital transformation.

In addition, the institutional environment is found to have a significant, albeit relatively weaker, impact on digital governance compared to internal factors such as technology and organizational capability. This finding suggests that external regulatory and policy factors still play a meaningful role in shaping governance structures and practices.

Regarding the dependent variable, the SEM results reveal that digital governance has a positive and statistically significant effect on online learning effectiveness, confirming its critical mediating role in translating organizational and technological resources into educational outcomes. Furthermore, the direct effects of digital infrastructure and organizational capability on online learning effectiveness are also supported, although their magnitudes differ.

Second, in terms of effect sizes and relative impacts, the findings indicate that organizational capability and digital governance are the most influential determinants of online learning effectiveness. This suggests that while technology is a necessary condition, the decisive factors lie in governance and organizational capacity. Digital infrastructure plays a supportive role, whereas digital governance functions as a central coordinating mechanism that optimizes resource utilization.

Importantly, the analysis also reveals a significant mediating effect of digital governance in the relationships between independent variables (technology, organizational capability, institutional environment) and online learning effectiveness. A substantial portion of these effects is transmitted through digital governance, confirming its central role in the research model.

Moreover, the coefficient of determination ($R^2$) indicates that the model explains a substantial proportion of variance in the dependent variable, demonstrating strong explanatory power. Additional diagnostic tests, including multicollinearity assessment, predictive relevance, and model robustness checks, further confirm the stability and reliability of the results. Overall, the hypothesis testing results not only validate the proposed theoretical relationships but also provide robust empirical evidence highlighting the central role of digital governance in higher education digital transformation. These findings offer important implications for developing effective governance models and strategic directions for educational institutions in the digital era. The SEM results confirm the central role of digital governance as a mediating mechanism linking resources to educational effectiveness.

## 6. Discussion

### *6.1. Comparison with International Studies*

In the context of global higher education digital transformation following the COVID-19, comparing the findings of this study with international research is essential for evaluating its academic contribution, generalizability, and theoretical relevance. The results reveal both convergences and divergences when contrasted with prior studies in the field of digital transformation and digital governance in higher education.

First, regarding points of convergence, the findings reaffirm several well-established trends in the international literature. Notably, the central role of digital governance as a coordinating and resource-optimizing mechanism is strongly supported. This aligns with studies conducted in developed countries, where digital governance is considered a critical factor in achieving substantive digital transformation rather than mere technological adoption.

Furthermore, the study confirms that organizational capability exerts a strong influence on both digital governance and online learning effectiveness, consistent with dynamic capabilities theory and empirical research from Europe and North America. This reinforces the view that human capital and managerial competence are decisive in translating technological investments into meaningful outcomes.

Additionally, the positive impact of digital infrastructure on online learning effectiveness is consistent with international research on e-learning and distance education, which highlights the importance of system quality and accessibility as foundational conditions for effective digital learning environments. However, the study also identifies several key divergences that reflect the specific context of private universities in Vietnam. The influence of the institutional environment is found to be more pronounced compared to many studies conducted in developed countries. This can be attributed to the characteristics of the Vietnamese higher education system, where government policies and regulations exert strong influence over institutional operations, particularly in the private sector.

Second, the level of system integration in Vietnamese private universities is relatively lower than that observed in developed contexts. While universities in Europe and North America have developed highly integrated digital ecosystems, many institutions in Vietnam still operate fragmented systems, limiting the effective utilization of technology.

Third, the adoption of advanced technologies such as AI and Big Data remains at an early stage in Vietnam, whereas these technologies are more deeply embedded in both teaching and governance processes in developed countries. This gap reflects differences in resources, technological capabilities, and digital readiness.

Fourth, the phenomenon of "surface-level digitalization" appears to be more prevalent in the Vietnamese context, where institutions adopt digital tools without fundamentally transforming governance structures or pedagogical approaches. This contrasts with the more holistic transformation observed in international settings. Another notable difference lies in the mediating role of digital governance. While international studies often treat digital governance as one component among many, this study highlights its central and strong mediating role between input factors and outcomes. This suggests that in developing contexts, digital governance may play a more critical role in system coordination and integration. Overall, the comparison with international studies indicates that while the fundamental principles of digital transformation and digital governance are universal, their implementation and effectiveness are highly context-dependent. These findings not only highlight the specificity of the Vietnamese context but also contribute to the refinement and extension of existing theories in emerging and developing economies. The study both confirms global trends and highlights contextual specificities, contributing to theoretical advancement in developing economies.

### *6.2. Strategic Opportunities*

In the context of global higher education digital transformation accelerated by the COVID-19, private universities in Vietnam are presented with transformative strategic opportunities to restructure their educational models, expand their operational scope, and enhance competitiveness within the digital education ecosystem. The findings identify three key strategic opportunity domains: market expansion, personalized learning, and internationalization of education.

First, regarding market expansion, digital transformation has significantly reduced spatial and temporal barriers in education, enabling institutions to reach learners beyond traditional geographical boundaries. Online and distance learning platforms allow private universities to scale enrollment and target new learner segments, including working professionals, adult learners, and international students. In particular, the growing demand for lifelong learning creates substantial opportunities for flexible, short-term, and online programs to become

major drivers of institutional growth. Universities can develop innovative formats such as micro-credentials, digital skill certifications, and demand-driven courses, thereby diversifying revenue streams and enhancing financial sustainability.

Second, in terms of personalized learning, the advancement of digital technologies such as artificial intelligence (AI) and learning analytics enables the design of tailored learning experiences that align with individual learner needs, capabilities, and learning pace. Rather than relying on standardized educational models, institutions can implement adaptive learning systems that dynamically adjust content, pedagogy, and learning pathways.

Although the current adoption of AI and Big Data in Vietnamese private universities remains limited, the potential for development in this area is substantial. Leveraging learning data not only enhances teaching effectiveness but also supports institutional management, forecasting, and decision-making. Personalized learning thus represents not only a technological innovation but also a strategic approach to improving educational quality and learner experience. Finally, regarding the internationalization of education, digital transformation facilitates global connectivity and collaboration in higher education. Digital platforms enable private universities in Vietnam to participate in global academic networks, establish joint programs, engage in academic exchange, and share educational resources. Importantly, cross-border online education offers the opportunity to attract international students without requiring substantial investment in physical infrastructure abroad. Institutions can offer English-medium programs, collaborate with international partners, and leverage global learning platforms to enhance their academic reputation and global positioning.

However, to effectively capitalize on these opportunities, institutions must develop comprehensive digital transformation strategies, strengthen digital governance capabilities, and ensure quality assurance aligned with international standards. The integration of technological innovation, governance reform, and international collaboration will be critical in enabling private universities in Vietnam to transition from followers to leaders in the digital education landscape.

Overall, the strategic opportunities identified in this study are not merely potential pathways but can be translated into tangible competitive advantages if supported by effective digital governance and long-term strategic vision. Digital transformation is not only a challenge but also a strategic opportunity for comprehensive restructuring in higher education.

### *6.3. Structural Challenges*

Alongside the strategic opportunities enabled by digital transformation in the post-COVID-19 era, private universities in Vietnam face a range of structural challenges that may hinder the depth and sustainability of transformation processes. These challenges are not only internal to institutions but are also embedded within broader institutional, governance, and societal contexts.

First, regarding institutional constraints, the current policy and regulatory framework governing higher education in Vietnam has not fully kept pace with the rapid advancement of digital technologies. Regulations related to online education, credit recognition, quality assurance, and degree certification for distance learning programs often lack coherence and flexibility, creating barriers to the implementation of innovative educational models. For private universities in particular, institutional autonomy in curriculum design, technological adoption, and international collaboration remains significantly influenced by state regulations. This may constrain innovation capacity and slow adaptation to global educational trends. Moreover, inconsistencies in policy formulation and implementation introduce uncertainty and risk into institutional strategic decision-making.

Second, the lack of digital governance capability is identified as one of the most critical bottlenecks in the digital transformation process. While many institutions have invested in technological infrastructure and digital platforms, their capacity to effectively integrate, coordinate, and leverage these resources remains limited. Specifically, many institutions lack comprehensive digital governance frameworks, including policies, processes, and data-driven decision-making mechanisms. Leadership and managerial teams are often insufficiently equipped with the skills and mindsets required to operate in digital environments, resulting in fragmented and short-term transformation efforts. Additionally, the shortage of highly skilled human resources in areas such as information technology, data analytics, and digital governance presents a significant barrier. In many cases, institutions rely heavily on external vendors for digital transformation initiatives, limiting their internal capacity building and long-term sustainability.

Third, the issue of the digital divide represents a systemic challenge affecting both learners and institutions. The digital divide extends beyond disparities in access to devices and internet connectivity to include differences in digital literacy, technological competence, and readiness to engage in online learning environments. For learners,

particularly those from rural or economically disadvantaged backgrounds, limited access to reliable technology and insufficient digital skills can significantly reduce learning effectiveness. This raises critical concerns regarding educational equity in the context of digital transformation.

At the institutional level, the digital divide is reflected in disparities in financial resources, technological capacity, and readiness for transformation among universities. Institutions with limited resources may struggle to invest in and sustain advanced technological systems, increasing the risk of falling behind in the digital education landscape. Importantly, these structural challenges tend to be interconnected and mutually reinforcing. For example, institutional constraints may reduce incentives for technological investment, while weak digital governance capabilities can exacerbate the effects of the digital divide. Addressing these challenges therefore requires a holistic approach that integrates institutional reform, capacity building, and equitable access to technology.

Overall, the structural challenges identified in this study are not merely short-term obstacles but represent foundational issues with long-term implications for the effectiveness and sustainability of digital transformation in higher education. Recognizing and addressing these challenges is essential for enabling private universities in Vietnam to fully capitalize on strategic opportunities in the digital era. Structural challenges are not only barriers but also critical tests of system capacity in digital transformation.

### *6.4. Theoretical Interpretation*

To further elucidate the academic implications of the findings, this section provides a theoretical interpretation grounded in three foundational frameworks: the Technology–Organization–Environment (TOE) framework, the Technology Acceptance Model (TAM), and Institutional Theory. Integrating these theoretical perspectives not only strengthens the validity of the findings but also contributes to the extension and refinement of existing theories in the context of digital transformation in higher education within developing economies.

First, from the perspective of the TOE framework, the study demonstrates strong alignment between the proposed research model and the three core dimensions of the theory. Specifically, digital infrastructure represents the technological dimension, organizational capability captures the organizational dimension, and the institutional environment reflects the external environmental context. SEM results confirm that all three dimensions significantly influence digital governance, which in turn affects online learning effectiveness. Importantly, this study extends the traditional TOE framework by incorporating digital governance as a central mediating variable that connects and coordinates input factors with outcomes. This finding suggests that in complex digital transformation contexts, TOE should be reconceptualized to explicitly incorporate governance mechanisms as an endogenous component of the system, rather than subsuming them within the organizational dimension.

Second, from the perspective of the Technology Acceptance Model (TAM), the findings provide indirect support for the role of constructs such as perceived usefulness and perceived ease of use in influencing online learning effectiveness. Although these constructs are not directly measured, variables such as digital infrastructure and organizational capability can be interpreted as antecedents shaping user perceptions and technology usage behaviors among faculty and students. Notably, the results indicate that the effectiveness of technology depends not only on user acceptance but also on how technology is governed and integrated within institutional systems. This extends TAM by incorporating governance and organizational dimensions, suggesting that technology acceptance is a necessary but insufficient condition for successful digital transformation.

Third, from the perspective of Institutional Theory, the study confirms the significant role of institutional factors in shaping organizational behavior and strategic choices. The findings indicate that the institutional environment has a meaningful impact on digital governance, reflecting the influence of coercive pressures (e.g., regulatory requirements), normative pressures (e.g., professional standards), and mimetic pressures (e.g., imitation of best practices).

In the Vietnamese context, where higher education is strongly regulated by the state, institutional factors play a particularly critical role in guiding and constraining digital transformation efforts. This explains why private universities, despite having strong incentives for innovation, must align their strategies with prevailing regulatory frameworks and institutional norms. A key contribution of this study lies in highlighting that institutional pressures are not purely constraining but can also act as drivers of innovation, especially when supportive digital transformation policies are introduced. This enriches Institutional Theory by emphasizing the dual role of institutional forces in shaping digital transformation processes. Overall, the theoretical interpretation based on TOE, TAM, and Institutional Theory

demonstrates that digital transformation in higher education is a multidimensional process in which technological, organizational, and institutional factors interact through governance mechanisms. This study thus contributes to the integration and extension of existing theories, offering a more comprehensive framework for understanding and managing digital transformation in higher education. The findings not only validate but also extend TOE, TAM, and Institutional Theory in the context of higher education digital transformation.

### *6.5. Policy and Governance Implications*

#### *6.5.1. Institutional Implications for Universities*

In the context of accelerated digital transformation in higher education following the COVID-19, universities - particularly private institutions - must proactively restructure their development models to adapt to systemic changes in the digital education environment. The findings of this study indicate that the effectiveness of digital transformation depends not only on technological investment but, more critically, on strategic vision and digital governance capability at the institutional level.

First, regarding the development of a comprehensive digital transformation strategy, universities need to formulate long-term, integrated, and future-oriented strategies rather than implementing fragmented and short-term technological solutions. Such strategies should adopt a system-based approach that aligns technological infrastructure, educational programs, pedagogical methods, organizational governance, and international collaboration.

An effective digital transformation strategy should begin with a clearly articulated digital vision and strategic objectives aligned with the institution's mission and competitive advantages. Universities should also conduct a comprehensive assessment of their digital readiness, including infrastructure, human resources, organizational culture, and governance frameworks, to develop an appropriate implementation roadmap.

Furthermore, the strategy should emphasize the re-design of educational models, transitioning from traditional approaches to flexible, learner-centered, and technology-enabled models. This includes the development of online programs, blended learning formats, short courses, and personalized learning pathways. Equally important is the need for system integration, ensuring interoperability among technological platforms, data systems, and governance processes. The development of integrated digital ecosystems enhances operational efficiency and enables data-driven strategic decision-making.

Second, regarding the development of digital governance capability, the study identifies this as a critical determinant of successful digital transformation. Universities should establish comprehensive digital governance frameworks, including policies, procedures, and data-driven decision-making mechanisms. This involves creating dedicated organizational structures for digital transformation, such as IT governance units or innovation centers, to coordinate and oversee transformation initiatives. At the same time, decentralizing decision-making and encouraging the participation of academic units can enhance organizational agility and responsiveness. A key priority is the development of digital competencies among faculty, administrators, and technical staff. Continuous training and capacity-building programs are essential to improve technological proficiency, data analytics capabilities, and innovative teaching practices. In addition, universities should foster a digital culture that promotes innovation, risk-taking, and continuous learning. Such a culture is essential for driving internal transformation and ensuring long-term sustainability. Another critical aspect is strengthening data governance, including the development of integrated data systems, ensuring information security, and enhancing data analytics capabilities. Data should be treated as a strategic asset that supports management, teaching, and decision-making processes. Finally, universities should expand strategic partnerships with technology firms, international organizations, and other educational institutions to leverage external resources, access advanced technologies, and enhance competitiveness. Participation in global education networks can also improve institutional visibility and international integration. Overall, the development of a comprehensive digital transformation strategy and strong digital governance capability is not only an urgent requirement but also a fundamental condition for private universities in Vietnam to improve educational quality, expand markets, and strengthen their position in the global digital education ecosystem. Strategy and digital governance constitute the backbone of successful digital transformation in universities.

#### *6.5.2. Proposed Digital Governance Model*

Building upon the empirical findings, integrated theoretical foundations (TOE, TAM, and Institutional Theory), and the policy and practical implications discussed above, this study proposes a three-layer digital governance model to enhance the effectiveness of digital transformation in online and distance education within private universities in Vietnam. The model adopts a system-based approach, emphasizing the dynamic interaction

among strategic, operational, and technological levels.

First, the strategic layer provides the overall direction for the digital transformation process. This layer encompasses the formulation of a digital vision, the definition of long-term strategic objectives, and the design of governance policies aligned with the institutional context and organizational capabilities of each university. At this level, top leadership plays a central role in shaping strategic direction, allocating resources, and establishing monitoring and evaluation mechanisms. A critical aspect of the strategic layer is ensuring alignment between digital transformation strategy and the institution's overall development strategy, thereby avoiding fragmented or superficial digitalization efforts. Moreover, this layer must incorporate institutional environmental factors, including regulatory frameworks, quality standards, and global trends, to ensure compliance and international compatibility.

Second, the operational layer translates strategic orientations into concrete actions and practices. This layer includes management processes, coordination mechanisms among functional units, and the implementation of teaching, learning, and student support activities in digital environments. Within the operational layer, digital governance is enacted through data-driven decision-making mechanisms, quality assurance processes, and performance evaluation systems. The establishment of standardized yet flexible processes enhances operational efficiency and enables institutions to adapt to rapidly evolving technological environments. A key component of the operational layer is the development of organizational capability, encompassing the competencies of faculty members, administrators, and technical staff. Continuous training in digital skills and the cultivation of an innovation-oriented organizational culture are essential for ensuring effective and sustainable digital transformation. Finally, the technological layer provides the infrastructure and technical tools that support the entire system. This layer includes learning management systems (LMS), online learning platforms, artificial intelligence (AI), Big Data technologies, and data management systems. A central feature of the technological layer is its integration and scalability, enabling seamless interoperability among systems and effective support for governance and educational activities. Additionally, ensuring information security, data protection, and regulatory compliance is a fundamental requirement at this level. A key contribution of the proposed model lies in emphasizing the bidirectional interactions among the three layers, where the strategic layer guides operational and technological activities, while feedback from the operational and technological layers informs continuous strategic refinement. This creates a dynamic governance system capable of learning and adapting over time. Overall, the proposed three-layer digital governance model offers both a theoretically integrated framework and a practical tool for private universities in Vietnam to design and implement digital transformation strategies in a coherent, effective, and sustainable manner. The three-layer model provides an integrated, flexible, and adaptive digital governance architecture.

## 7. Conclusion

### *7.1. Contributions of the research*

Building upon the identified research gaps and the articulated research objectives and questions, this study aims to generate meaningful contributions at three interrelated levels: theoretical, practical, and policy-oriented. In doing so, it seeks not only to advance academic discourse but also to provide a robust scientific foundation for decision-making in higher education in the post-COVID-19 era. In the context of profound global digital transformation in higher education, particularly under the impact of the COVID-19, this study provides a comprehensive and systematic analysis of digital transformation and digital governance in online and distance education within private universities in Vietnam. By employing a mixed-methods approach and grounding the analysis in established theoretical frameworks, the study yields significant findings with both academic and practical implications.

First, regarding the summary of key findings, the study confirms that digital transformation in Vietnamese private universities is accelerating, yet remains constrained by limitations in system integration and digital governance capability. Key factors such as digital infrastructure, organizational capability, and the institutional environment are found to significantly influence digital governance, which in turn acts as a critical mediating mechanism in translating inputs into effective online learning outcomes. The analysis also identifies several systemic bottlenecks, including fragmented technological platforms, the absence of comprehensive digital governance frameworks, and disparities in digital competencies among stakeholders. At the same time, the study highlights important strategic opportunities, such as market expansion, personalized learning, and internationalization, alongside structural challenges including institutional constraints, governance limitations, and the digital divide. First, regarding theoretical contributions, this study advances an

integrative approach that bridges three domains often treated in isolation in prior research: digital transformation, digital governance, and the system approach. By developing a multi-level analytical framework, the study reconceptualizes digital transformation in higher education as a complex adaptive and systemic process, while simultaneously elucidating the co-evolutionary dynamics between technological and governance dimensions. This contribution addresses the prevailing fragmentation in the literature and enhances both the explanatory power and cross-contextual generalizability of research in this field. Furthermore, the study extends existing theoretical frameworks by incorporating multiple layers of analysis, including the technology layer, governance layer, and system dynamics layer. This integrative perspective enables a more comprehensive understanding of non-linear dynamics, spillover effects, and structural bottlenecks in digital transformation processes. In addition, the study contributes to the conceptual development of emerging constructs such as "adaptive digital governance" and "integrated digital education ecosystems," which are gaining increasing attention in international scholarship.

Second, in terms of research contributions, this study makes substantial contributions across theoretical, practical, and policy dimensions. Theoretically, it integrates and extends the TOE framework, TAM, and Institutional Theory by proposing a system-oriented analytical model in which digital governance serves as a central mediating construct. This contributes to the refinement of existing theories in the context of digital transformation in developing economies. Practically, the study offers a comprehensive overview of the current state of digital transformation and governance in Vietnamese private universities and proposes a feasible three-layer digital governance model (strategic–operational–technological). This model not only provides strategic guidance but also facilitates effective and coordinated implementation of digital transformation initiatives. From a policy perspective, the study provides actionable implications for government and educational institutions in terms of regulatory development, digital capacity building, and ecosystem collaboration. These insights can inform future policy-making and educational reform efforts. Finally, regarding strategic significance, the study emphasizes that digital transformation is not merely a technological trend but a fundamental restructuring process in higher education systems. For private universities in Vietnam, the ability to effectively leverage digital transformation will be a decisive factor in enhancing competitiveness, expanding market reach, and achieving international integration. Second, in terms of practical contributions, the study provides a comprehensive and empirically grounded assessment of digital transformation and digital governance in online and distance education within private universities in Vietnam. Through system-level analysis and governance maturity evaluation, the study enables institutional leaders to identify strengths, weaknesses, opportunities, and challenges associated with their digital transformation efforts. Importantly, the identification of systemic bottlenecks and leverage points offers actionable insights for optimizing resource allocation and enhancing educational quality. Moreover, the study proposes an integrated and adaptive digital governance model that can serve as a practical tool for private universities in designing and implementing their digital transformation strategies. This model emphasizes the critical roles of data, technology, and digital leadership in generating sustainable value, while also providing concrete guidance on organizational design, operational processes, and performance evaluation in online and distance education systems. Moreover, the development of effective and adaptive digital governance models will enable institutions to respond to the rapidly evolving global education landscape. In this context, the roles of government, universities, and other stakeholders must be redefined toward greater collaboration, innovation, and sustainability. Overall, this study not only advances the understanding of digital transformation in higher education but also provides a robust theoretical and practical foundation for designing and implementing future digital strategies.

Finally, with respect to policy implications, the study offers significant insights for the development and refinement of regulatory and institutional frameworks governing digital transformation in higher education in Vietnam. Based on the analysis of structural challenges and governance gaps, the study proposes policy directions at multiple levels, including the formulation of national digital education strategies, the establishment of legal frameworks for online and distance education, and the development of quality assurance standards in digital learning environments.

Notably, the study underscores the necessity of transitioning from traditional administrative models to data-driven digital governance, while also advocating for enhanced collaboration among key stakeholders, including government agencies, higher education institutions, and technology enterprises. These policy implications are not only relevant to Vietnam but may also be transferable to other developing countries with similar institutional

contexts. Overall, the contributions of this study are designed to be integrative and multidimensional, ensuring novelty, academic rigor, and practical relevance. Digital transformation is the driving force of higher education restructuring, and digital governance is the key to unlocking its full potential.

### *7.2. Limitations of this study and directions for future research*

#### *7.2.1. Limitations in this study*

Despite providing comprehensive and valuable insights into digital transformation and digital governance in online and distance education within private universities in Vietnam, this study acknowledges several limitations that should be transparently addressed to ensure academic rigor and to guide future research endeavors.

First, regarding sampling limitations, the study primarily focuses on private universities in Vietnam, with respondents including institutional leaders, faculty members, and students from selected institutions. Although purposive sampling was employed to ensure a certain level of diversity, the sample size and scope remain limited, potentially affecting the generalizability of the findings to the broader higher education system, including public universities or international contexts. Furthermore, variations in institutional size, academic disciplines, and levels of digital maturity among the sampled universities may introduce potential biases in the analysis. Therefore, the findings should be interpreted within the specific context of the study and should not be indiscriminately generalized to other educational systems without appropriate contextual adaptation.

Second, regarding methodological limitations, the study adopts a mixed-methods approach, combining quantitative surveys and qualitative interviews. While this approach enhances reliability through triangulation, it is not without constraints. Specifically, quantitative data collected Likert-scale questionnaires may be subject to subjective biases, such as perception bias and social desirability bias. Meanwhile, qualitative data derived from expert interviews may be limited by the participants' individual perspectives and experiences. Additionally, the use of Structural Equation Modeling (SEM) primarily captures correlational relationships and does not fully establish causality. Therefore, caution is required in interpreting the results and avoiding overgeneralization beyond the scope of the data.

#### *7.2.2. Future research directions*

Limitations do not weaken the study; rather, they open pathways for deeper scholarly advancement. Regarding future research directions, this study opens several promising avenues for further investigation to deepen the understanding of digital transformation in higher education. One important direction is to expand the research scope to include public universities or cross-national comparative studies, enabling the examination of digital transformation models across different institutional and regulatory contexts. This would help assess the generalizability and applicability of the proposed model. Moreover, future studies could adopt longitudinal research designs to track changes in digital transformation processes over time, thereby providing deeper insights into causal relationships and system dynamics. Another promising direction involves integrating emerging technologies such as artificial intelligence (AI), machine learning, and Big Data analytics into the research framework to better understand their roles in enhancing governance and educational outcomes.

In addition, future research could employ multi-level analysis to examine interactions across individual, organizational, and systemic levels, offering a more comprehensive understanding of digital transformation processes. Finally, advancing interdisciplinary research that combines perspectives from educational management, information technology, economics, and data science would contribute to the development of more integrated theoretical and practical models. Overall, despite its limitations, this study provides a solid foundation for future research and contributes to shaping the evolving field of digital transformation in higher education in Vietnam and similar contexts.

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# CHUYỂN ĐỔI SỐ VÀ QUẢN TRỊ SỐ TRONG ĐÀO TẠO TRỰC TUYẾN VÀ ĐÀO TẠO TỪ XA TẠI CÁC TRƯỜNG ĐẠI HỌC NGOÀI CÔNG LẬP Ở VIỆT NAM: *PHÂN TÍCH HỆ THỐNG, CƠ HỘI CHIẾN LƯỢC VÀ THÁCH THỨC CẤU TRÚC*

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**Tóm tắt:**

*Trong bối cảnh chuyển đổi số đang tái định hình sâu sắc hệ sinh thái giáo dục đại học toàn cầu, đào tạo trực tuyến và đào tạo từ xa đã trở thành trụ cột chiến lược, đặc biệt tại các trường đại học ngoài công lập với mức độ linh hoạt cao.*

*Tuy nhiên, tại Việt Nam, quá trình này vẫn đối mặt với sự phân mảnh về hệ thống, hạn chế trong năng lực quản trị số và thiếu vắng các khung chính sách tích hợp, các nghiên cứu hiện có vẫn thiếu một cách tiếp cận tích hợp giữa chuyển đổi số và quản trị số dưới góc nhìn hệ thống. Bài báo này nhằm phân tích toàn diện hệ thống chuyển đổi số và thực hành quản trị số trong đào tạo trực tuyến và đào tạo từ xa tại các trường đại học ngoài công lập, thông qua cách tiếp cận hệ thống và định hướng chính sách, đồng thời xác định các cơ hội chiến lược và thách thức cấu trúc trong bối cảnh chuyển đổi số.*

*Dựa trên khung lý thuyết tích hợp giữa TOE (Công nghệ – Tổ chức – Môi trường), lý thuyết quản trị số và lý thuyết thể chế, nghiên cứu sử dụng phương pháp hỗn hợp (Mixed-Methods), kết hợp khảo sát định lượng với 312 giảng viên và nhà quản lý tại 15 trường đại học ngoài công lập, cùng với 28 cuộc phỏng vấn sâu bán cấu trúc, phỏng vấn chuyên gia và nghiên cứu trường hợp điển hình. Dữ liệu được phân tích thông qua mô hình phương trình cấu trúc (SEM) và phân tích chủ đề (Thematic Analysis), dựa trên khung lý thuyết tích hợp giữa TOE (Technology–Organization–Environment) và quản trị số, nhằm làm rõ các yếu tố ảnh hưởng và cơ chế vận hành của hệ thống.*

*Kết quả nghiên cứu cho thấy: (i) Chuyển đổi số trong đào tạo trực tuyến và đào tạo từ xa còn thiếu tính tích hợp hệ thống và phụ thuộc mạnh vào năng lực tổ chức; (ii) Quản trị số đóng vai trò trung gian then chốt trong việc chuyển hóa năng lực công nghệ thành hiệu quả đào tạo; (iii) Hạ tầng số và năng lực tổ chức có ảnh hưởng đáng kể đến hiệu quả đào tạo trực tuyến thông qua vai trò trung gian của quản*

**Lịch sử bài báo**

Ngày nhận bài: 08/12/2025

Ngày phản biện: 25/02/2026

Ngày tác giả sửa: 20/3/2026

Ngày duyệt đăng: 25/3/2026

Ngày phát hành: 30/3/2026

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*trị số; (iv) Các cơ hội chiến lược bao gồm mở rộng thị trường đào tạo, cá nhân hóa học tập và quốc tế hóa chương trình và (v) Các rào cản cấu trúc, bao gồm hạn chế về thể chế, khoảng cách số và thiếu hụt nguồn nhân lực số, đang làm suy giảm hiệu quả triển khai.*

*Nghiên cứu đóng góp một khung phân tích hệ thống tích hợp chuyển đổi số – quản trị số trong giáo dục đại học, đồng thời đề xuất một mô hình quản trị số đa tầng nhằm hỗ trợ hoạch định chính sách và chiến lược phát triển bền vững, nhằm thúc đẩy chuyển đổi số bền vững trong giáo dục đại học ngoài công lập tại Việt Nam.*

**Từ khóa:** *Chuyển đổi số; Quản trị số; Đào tạo trực tuyến; Đào tạo từ xa; Đại học ngoài công lập; Việt Nam.*