



DIGITAL TRANSFORMATION IN EDUCATIONAL MANAGEMENT IN THAILAND: A SYSTEMATIC REVIEW OF LEADERSHIP, GOVERNANCE, AND INSTITUTIONAL INNOVATION

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Abstract

Background. Digital transformation has become a central organising logic for educational management in Thailand, propelled by the Thailand 4.0 economic agenda, the Ministry of Higher Education, Science, Research and Innovation (MHESI) reform program, and the accelerating digitalisation of schools and universities. Yet the evidence base linking digital leadership, governance systems, and institutional innovation remains fragmented across disciplines, methods, and institutional levels.

Purpose. This systematic review synthesises peer-reviewed literature (2015–2026) on digital transformation in Thai educational management, mapping how leadership practices, governance mechanisms, and institutional innovations interact to shape organisational effectiveness, and identifying research gaps and future directions.

Methodology. Following the PRISMA 2020 statement, six databases (Scopus, Web of Science, ERIC, ScienceDirect, SpringerLink, and Google Scholar) were searched using Boolean strings combining digital transformation, educational management/leadership/governance, institutional innovation, and Thailand. Records were screened against pre-specified inclusion and exclusion criteria; eligible studies underwent structured data extraction and inductive–deductive thematic analysis.

Results. Five themes were derived: (1) digital leadership competencies and vision; (2) digital governance and policy implementation; (3) institutional innovation and organisational change; (4) persistent barriers, including the rural–urban divide, readiness gaps, and funding constraints; and (5) emerging trajectories toward AI, learning analytics, smart schools, and Education 5.0. Across studies, leadership repeatedly emerged as the pivotal mediator translating national policy into institutional capability, while governance maturity and innovation culture moderated the pace and equity of transformation.

Conclusion. Digital transformation in Thai educational management is best understood as a socio-technical, leadership-driven process rather than a technology-procurement event. The review offers an integrative model



and targeted recommendations for policymakers, institutional leaders, and researchers, and flags the need for longitudinal, theory-driven, and equity-focused inquiry.

Keywords: *digital transformation; educational management; educational leadership; educational governance; institutional innovation; Thailand; systematic review*

1. Introduction

Across the past decade, digital transformation has shifted from a peripheral concern of information-technology departments to a defining strategic imperative for entire education systems. Where earlier waves of educational technology emphasised the adoption of discrete tools, contemporary digital transformation denotes a deeper reconfiguration of how educational organisations create value, coordinate work, govern themselves, and relate to learners and communities. Vial (2019) frames digital transformation as a process in which digital technologies trigger significant changes to an organisation's value proposition, structures, and operating logic, mediated by strategic responses rather than by technology alone. In educational management, this reframing carries particular weight: schools and universities are simultaneously service providers, public institutions, and knowledge organisations, and each of these identities is reshaped by digitalisation.

The vocabulary of Education 4.0, digital governance, smart education, and the data-driven institution has consequently entered mainstream policy and scholarship. These constructs share an underlying claim: that the effective integration of digital infrastructure, analytics, and platforms can improve organisational effectiveness, widen access, and align education with the competency demands of a digital economy. Kane, Palmer, Phillips, Kiron, and Buckley (2015) argue that strategy—not technology—drives durable digital transformation, a proposition with direct implications for how educational leaders prioritise investment and change. Westerman, Bonnet, and McAfee (2014) similarly show that transformation outcomes hinge on the interaction between digital capability and leadership capability, rather than on either alone.

For educational management specifically, three interlocking domains have emerged as the principal levers of transformation: leadership, which supplies vision, direction, and the mobilisation of people; governance, which structures decision rights, accountability, and the use of data; and institutional innovation, which converts strategic intent into new practices, services, and organisational forms. The relationships among these domains, and the conditions under which they produce genuine organisational change rather than superficial digitisation, are the central concern of this review.

The COVID-19 pandemic functioned as an unplanned accelerant of these dynamics, compressing years of anticipated change into months and exposing the uneven readiness of institutions to operate through digital means. The pandemic demonstrated that infrastructure, staff capability, and leadership adaptability are not separable concerns but mutually dependent conditions of continuity. In its aftermath, the question facing educational managers is no longer whether to digitalise but how to consolidate emergency adaptations into deliberate, equitable, and sustainable transformation. This shift from reactive adoption to strategic transformation heightens the salience of management, leadership, and governance—the very constructs this review consolidates.

It is important, at the outset, to distinguish digitisation, digitalisation, and digital transformation, terms often used interchangeably to the detriment of conceptual clarity. Digitisation refers to the conversion of analogue information into digital form; digitalisation refers to the use of digital technologies to improve existing processes; and digital transformation refers to the more fundamental reconfiguration of organisational value creation, structures, and culture. Many initiatives labelled as transformation are, on closer inspection, digitisation or digitalisation efforts that leave underlying structures and practices intact. This review reserves the language of transformation for change that reaches organisational logic, and reads the Thai evidence with this distinction in mind.

1.2 The Thai Context



Thailand offers a particularly instructive setting in which to examine these dynamics. The national Thailand 4.0 agenda positions education as an engine of economic transformation through lifelong learning and digital innovation, yet the gap between national ambition and institutional capacity remains substantial (Buasuwan, 2018). The digital economy contributed an estimated six percent of national GDP in 2023 and is projected to grow markedly by 2027, and the government has repeatedly prioritised the digital upskilling of educational personnel and the integration of digital technologies into teaching, learning, and administration (Prayoonvong & Limwongthong, 2025).

Institutional reform has proceeded on several fronts. The establishment of the Ministry of Higher Education, Science, Research and Innovation (MHESI) and initiatives such as the Reinventing University program have sought to differentiate institutional missions, modernise administrative systems, and strengthen international competitiveness. Basic-education planning under successive national development plans has emphasised twenty-first-century competencies, teacher digital capability, and the extension of connectivity to under-resourced schools. In parallel, the discourse of the smart school and the digitally mature institution has been promoted as a model toward which schools and universities should converge.

Thai scholarship on digital transformation in education has grown accordingly. Tungpantong, Nilsook, and Wannapiroon (2022) applied confirmatory factor analysis to identify the components of digital transformation in Thai higher-education institutions, isolating dimensions spanning strategy, process, people, technology, and governance. Laorach and Tuamsuk (2022) examined the factors influencing the digital transformation of Thai universities, while Sirilak and Wannasri (2023) proposed a management model for higher-education institutions in the digital era. This maturing literature provides valuable point estimates, but it remains dispersed across institutional levels, regions, and journals, and few studies integrate leadership, governance, and innovation within a single explanatory frame.

Thailand's context also carries distinctive cultural and structural features that shape how transformation unfolds. A centralised administrative tradition, the influence of Buddhist educational values, hierarchical patterns of authority, and pronounced disparities between the metropolitan centre and rural provinces all condition the reception and enactment of digital reform. Transformation strategies imported wholesale from Western or highly urbanised settings frequently underperform when they neglect these realities. The Thai evidence accordingly emphasises culturally responsive integration—adapting digital models to local values, capacities, and constraints rather than imposing generic blueprints—an emphasis that distinguishes it from much of the international literature and that this review foregrounds.

Finally, the institutional architecture of Thai education is itself in flux. The categorisation of universities by mission under the Reinventing University initiative, the coupling of quality assurance to national digital platforms, and the growing use of key performance indicators as instruments of governance together create a policy environment in which digital transformation is simultaneously encouraged and constrained. Understanding transformation in Thailand therefore requires attention not only to what individual institutions do but to the national systems within which they operate—a multi-level perspective that the present synthesis adopts.

1.3 Research Gap

Three gaps motivate this review. First, findings are fragmented: individual studies illuminate specific competencies, adoption factors, or barriers, but the field lacks a consolidated account of how these elements combine at the institutional level. Second, synthesis is scarce: although systematic reviews of digital transformation in higher education exist internationally (Singun, 2025), few concentrate on the Thai educational-management context or read the evidence through the combined lens of leadership, governance, and innovation. Third, theoretical integration is limited: much of the empirical work is descriptive or instrument-validation oriented, with insufficient articulation of the mechanisms linking policy, leadership behaviour, governance structures, and organisational outcomes. A structured synthesis is therefore needed to organise what is known, expose what is not, and orient future inquiry.

A fourth, more subtle gap concerns the level of analysis. A substantial share of Thai research operates at the individual level—measuring the competencies, perceptions, or readiness of administrators and teachers—while transformation is, by definition, an organisational and often a system-level phenomenon. The translation from individual attributes to institutional outcomes is frequently assumed rather than demonstrated, leaving a conceptual gap between what is measured and what is claimed. By synthesising across levels and by making the mediating role of leadership explicit, this review seeks to bridge that gap and to specify how individual capabilities, organisational structures, and system-level policies interlock.

1.4 Problem Statement

Despite sustained national investment and a growing body of Thai research, educational managers and policymakers lack an integrated, evidence-based understanding of how digital transformation actually unfolds within Thai schools and universities—specifically, how leadership, governance, and institutional innovation interact to enable or constrain effective transformation. Without such synthesis, reform efforts risk over-investing in technology while under-investing in the leadership and governance capabilities that determine whether technology yields organisational value. This review addresses that problem by systematically consolidating and critically analysing the available evidence.

1.5 Research Objectives

1. Examine the trends, volume, and characteristics of research on digital transformation in educational management in Thailand.
2. Identify the leadership practices and competencies that support digital transformation in Thai educational institutions.
3. Analyse the governance mechanisms—policy, data, and accountability—that enable educational digitalisation.
4. Examine the institutional innovations through which transformation is enacted.
5. Identify research gaps and articulate a future research agenda.

1.6 Research Questions

- RQ1. What are the trends and characteristics of the literature on digital transformation in educational management in Thailand (2015–2026)?
- RQ2. Which leadership practices and competencies are associated with successful digital transformation in Thai educational institutions?
- RQ3. What governance mechanisms support educational digitalisation, and how do they shape transformation outcomes?
- RQ4. What institutional innovations characterise digitally transforming Thai schools and universities?
- RQ5. What are the principal barriers, gaps, and future directions identified in the literature?

1.7 Significance of the Study

The review contributes on four levels. Theoretically, it integrates digital-transformation, leadership, governance, and innovation constructs into a single conceptual model tailored to the Thai educational-management context. Practically, it distils actionable competencies and governance practices for institutional leaders. For policy, it aligns institutional-level evidence with national reform agendas and highlights equity considerations, notably the rural–urban divide. For research, it supplies a transparent evidence map and a prioritised future agenda that subsequent studies can build upon, structured so that each identified gap maps onto a corresponding, actionable line of future inquiry.



The review is also timely given the convergence of three policy currents in Thailand: the maturation of the Thailand 4.0 agenda, the post-pandemic normalisation of hybrid and online instructional modes, and the accelerating national conversation on artificial intelligence and learning analytics in education. Educational leaders and institutional planners currently draw on a scattered mix of ministry circulars, vendor white papers, and single-institution case studies when designing digital-transformation roadmaps, with few syntheses that connect leadership behaviour, governance architecture, and innovation outcomes into one evidence base. By consolidating the available peer-reviewed literature into thematic findings, a conceptual framework, and a prioritised research agenda, this review is intended to function as a reference point that university administrators, quality-assurance offices, and Ministry of Higher Education, Science, Research and Innovation (MHESI) planners can consult when calibrating their own digital-transformation strategies, while simultaneously giving graduate researchers a structured starting point for empirical work that tests, extends, or challenges the patterns identified here.

2. Literature Review

This section reviews the theoretical foundations and thematic literature that inform the study. It proceeds from the theories that explain digital transformation, through the leadership and governance literatures, to institutional innovation, culminating in the conceptual framework that guides the synthesis.

2.1 Theories of Digital Transformation

Four theoretical lenses recur across the digital-transformation literature. Digital transformation theory itself, as synthesised by Vial (2019), conceptualises transformation as a socio-technical process in which technology use, driven by strategic responses, produces structural and value-proposition change; disruptions and organisational barriers moderate the path from technology to outcome. This process orientation counters the naïve equation of transformation with procurement and foregrounds leadership and organisational conditions.

The Technology Acceptance Model (Davis, 1989) and its unified successor, the Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, Davis, & Davis, 2003), explain individual-level adoption through perceived usefulness, ease of use, social influence, and facilitating conditions. In educational settings these constructs illuminate why teacher and administrator readiness is so consequential: transformation stalls where end-users do not perceive value or lack enabling support. Diffusion of Innovations theory (Rogers, 2003) complements this by modelling how innovations spread through a social system via perceived relative advantage, compatibility, complexity, trialability, and observability, and by identifying the role of change agents and opinion leaders—an apt description of the digital leader.

Finally, digital-maturity models provide a developmental scaffold, arraying organisations along stages from initial digitisation to full transformation across dimensions such as strategy, culture, technology, and governance. Thai applications of these frameworks—for example the component structures identified by Tungpantong et al. (2022)—demonstrate their utility for diagnosing institutional readiness, though critics caution that maturity models can imply a mechanistic linearity that understates political and cultural contingency.

2.2 Educational Leadership in the Digital Era

The leadership literature has generated several partially overlapping constructs relevant to transformation. Digital leadership denotes the capacity to set a technology-enabled vision, model digital practice, and cultivate the conditions for organisational learning; Sheninger (2019) articulates pillars spanning communication, learning environments, and professional growth. Transformational leadership, with its emphasis on inspirational motivation and intellectual stimulation, is frequently invoked to explain how leaders mobilise commitment to change. Distributed leadership (Spillane, 2006; Harris, 2013) reframes leadership as a property of interactions across the organisation rather than the attribute of a single figure, a perspective well suited to the cross-functional demands of digitalisation. Technology leadership, finally, foregrounds the specific competencies—infrastructure planning, data literacy, and digital pedagogy stewardship—required to steward transformation.

Empirical Thai work substantiates these constructs. Prayoonvong and Limwongthong (2025) identify five dimensions of effective school leadership in Bangkok's digital transformation—digital-competency integration, strategic crisis navigation, adaptive instructional leadership, student-centred digital pedagogies, and continuous professional self-development—and report that administrators strong across these dimensions achieve markedly higher teacher satisfaction and transformation success. Such findings echo Leithwood, Harris, and Hopkins (2020), who reaffirm that leadership effects on organisational outcomes operate largely through the cultivation of capacity and commitment rather than through direct intervention.

A recurring debate concerns whether digital leadership constitutes a genuinely distinct construct or a contextual application of established leadership models. The weight of evidence suggests the latter with important qualifications: the enduring functions of leadership—setting direction, developing people, redesigning the organisation, and managing the instructional programme—persist, but their enactment in digital contexts demands



new competencies, particularly data literacy, comfort with ambiguity, and the capacity to lead distributed and sometimes virtual teams. Digital leadership, on this reading, is less a replacement for transformational or distributed leadership than an extension of them into a terrain where the pace of change is faster and the tools more consequential. This framing guards against the tendency to treat every technological shift as requiring an entirely new leadership paradigm, while acknowledging the real novelty that digitalisation introduces.

2.3 Educational Governance and Digitalisation

Governance concerns the structures and processes through which decisions are made, resources allocated, and accountability enforced. In the digital context, e-governance introduces platform-based administration, digital records, and online quality-assurance systems; data-driven decision-making shifts authority toward those who can interpret institutional analytics; and policy implementation becomes a test of the alignment between national mandates and institutional capability. Governance maturity thus conditions whether digital investment translates into coordinated action or into fragmented, duplicative systems.

In Thailand, governance reform has been prominent. National quality-assurance infrastructures such as the CHE QA Online system illustrate the coupling of governance and digitalisation, and studies of institutional management models in the digital era emphasise the modernisation of administrative systems, the strengthening of governance structures, and the promotion of data-driven decision-making as levers of agility and accountability (Sirilak & Wannasri, 2023). Critical scholarship cautions, however, that governance-by-metrics—the proliferation of KPIs and OKRs—can reshape professional identities and priorities in ways that are not always aligned with educational values, underscoring the political dimension of digital governance.

The literature further distinguishes the technical from the adaptive dimensions of digital governance. The technical dimension concerns systems, data pipelines, interoperability, and reporting; the adaptive dimension concerns the human and political work of clarifying decision rights, building trust in data, and negotiating the redistribution of authority that analytics can provoke. Institutions that invest heavily in the technical dimension while neglecting the adaptive one frequently accumulate dashboards without decisions—rich in information yet poor in the organisational routines that convert information into action. Effective digital governance, the evidence suggests, is therefore as much a matter of culture and capability as of infrastructure, and it is precisely at this intersection that leadership and governance become inseparable.

2.4 Institutional Innovation and Organisational Change

Institutional innovation refers to the creation of new practices, services, structures, and cultures through which transformation is realised. The literature spans smart-school and smart-campus models, digital learning ecosystems, innovation management, and organisational agility. A recurring insight is that sustainable innovation depends less on isolated technological novelty than on an innovation culture—shared norms that legitimise experimentation, tolerate intelligent failure, and reward collaborative problem-solving. Fullan (2016) emphasises that durable change requires attention to the moral purpose, capacity building, and coherence-making that allow innovations to take root rather than remain pilot projects.

Thai contributions to this strand increasingly frame transformation as the construction of high-performance digital education organisations, integrating enterprise architecture, information-systems success, and human-performance considerations. These accounts position institutional innovation as the connective tissue between leadership vision and governance structures, converting strategic intent into embedded practice.

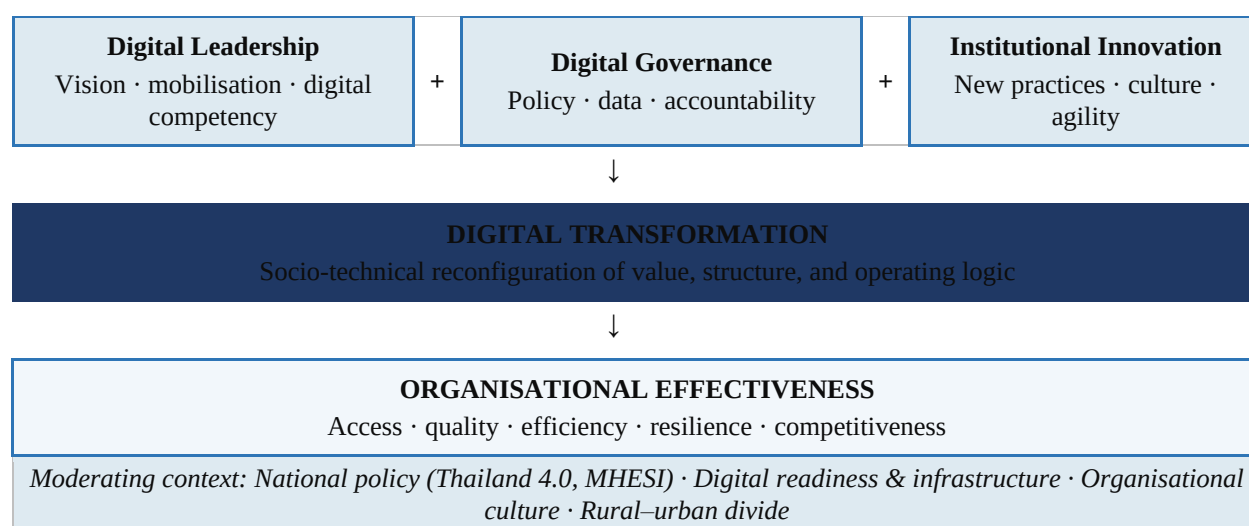
Organisational agility deserves particular emphasis as an innovation capability. Agility denotes the capacity to sense environmental change and reconfigure resources and routines in response—precisely the capacity that rapid digital and pandemic-driven disruption demands. Agile institutions distribute decision-making, iterate rapidly through cycles of experimentation and feedback, and treat digital platforms as enablers of responsiveness

rather than as ends in themselves. The literature suggests that agility is difficult to graft onto rigidly hierarchical structures, which helps explain why distributed leadership and adaptive governance are so frequently paired with successful innovation. In the Thai context, where administrative traditions tend toward centralisation, the cultivation of agility represents both a significant opportunity and a substantial change-management challenge.

2.5 Conceptual Framework

Synthesising these literatures, the study adopts a conceptual framework in which three institutional capabilities—digital leadership, digital governance, and institutional innovation—jointly drive digital transformation, which in turn shapes organisational effectiveness. Leadership supplies vision and mobilisation; governance supplies structure, data, and accountability; and innovation supplies the novel practices through which transformation is enacted. The relationships are reciprocal and are moderated by contextual conditions—national policy (Thailand 4.0, MHESI reform), digital readiness and infrastructure, and organisational culture—that accelerate or constrain the process. Figure 2 depicts this framework, which structures the thematic synthesis that follows.

Figure 2. Conceptual Framework of Digital Transformation in Thai Educational Management



Reciprocal relationships link the three capabilities; contextual conditions moderate the strength and equity of transformation.



3. Methodology

3.1 Research Design

The study employs a systematic review of related literature (SRRL). A systematic review is a transparent, reproducible method for identifying, appraising, and synthesising the available evidence on a defined question, minimising bias relative to narrative reviews (Page et al., 2021). Given the descriptive and heterogeneous nature of the underlying studies, a qualitative thematic synthesis was adopted rather than a statistical meta-analysis.

3.2 Review Protocol: PRISMA 2020

The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement (Page et al., 2021), progressing through the identification, screening, eligibility, and inclusion phases. The protocol specified the research questions, databases, search strings, eligibility criteria, screening procedure, data-extraction fields, and synthesis method in advance. The four phases are summarised in the flow diagram in Figure 1.

3.3 Information Sources (Databases)

Six sources were searched to balance coverage of indexed, peer-reviewed literature with grey-literature reach:

- **Scopus** — multidisciplinary indexed coverage;
- **Web of Science** — citation-indexed peer-reviewed literature;
- **ERIC** — education-specific database;
- **ScienceDirect** — full-text journal articles;
- **SpringerLink** — full-text journal and book chapters;
- **Google Scholar** — breadth and grey-literature capture (screened for peer-reviewed status).

3.4 Search Strategy and Keywords

Boolean strings combined the core construct with the domain and country. Representative strings included:

“Digital Transformation” AND “Educational Management” AND “Thailand”

(“Digital Leadership” OR “Technology Leadership”) AND Thailand AND (school OR university)

“Educational Governance” AND (digital OR e-governance) AND Thailand

(“Institutional Innovation” OR “smart school” OR “digital maturity”) AND education AND Thailand

Searches were limited to title, abstract, and keyword fields where supported, and were re-run to capture records published up to the review cut-off.

3.5 Eligibility Criteria

Inclusion criteria

- Published between 2015 and 2026;
- Peer-reviewed journal articles, indexed conference papers, or scholarly book chapters;
- Written in English;
- Focused on Thailand (or including Thailand as a distinct case);

- Addressing digital transformation, leadership, governance, or innovation within educational management.

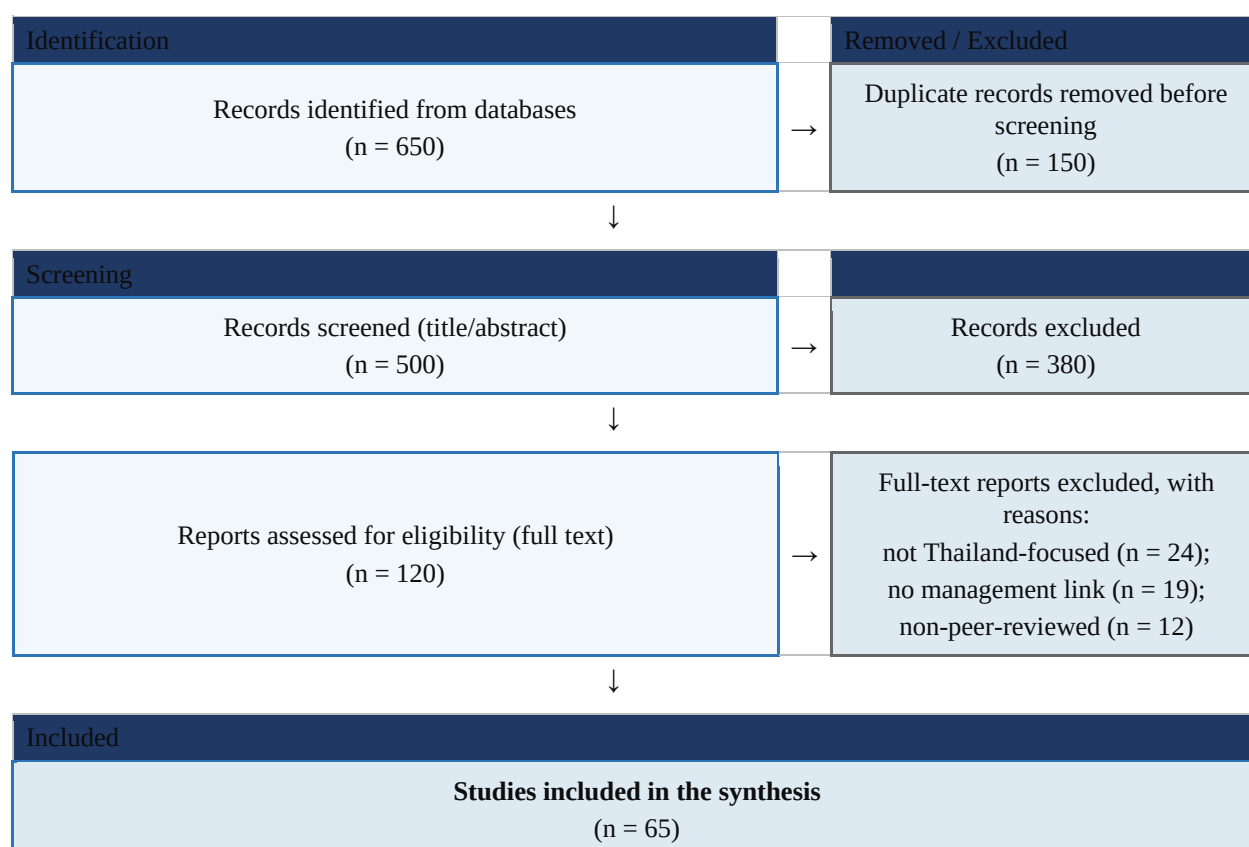
Exclusion criteria

- Non-educational or purely technical contexts with no management relevance;
- Editorials, conference abstracts without full text, and opinion pieces;
- Duplicates across databases;
- Studies lacking a discernible link to leadership, governance, or institutional innovation.

3.6 Study Selection (Screening Process)

Records were de-duplicated and screened by title and abstract against the eligibility criteria; potentially relevant reports were retrieved and assessed in full text. Figure 1 presents the PRISMA flow. **The counts shown are illustrative placeholders and must be replaced with the results of the executed search before submission.**

Figure 1. PRISMA 2020 Flow Diagram (illustrative counts — replace with executed search)



Structure follows PRISMA 2020 (Page et al., 2021). Counts are placeholders pending the executed search.

3.7 Data Extraction

A structured extraction matrix captured, for each included study: authors and year; institutional level (basic education, higher education, or system); region; methodology and sample; the transformation dimension(s) addressed (leadership, governance, innovation); principal findings; and reported barriers or enablers. Table 1 summarises the characteristics of included studies, and Table 2 presents the thematic coding matrix.

3.8 Data Analysis: Thematic Synthesis



Analysis followed the six phases of thematic analysis (Braun & Clarke, 2006): familiarisation with the extracted data; generation of initial codes; searching for themes by clustering codes; reviewing themes against the data; defining and naming themes; and producing the synthesis. Coding combined a deductive scaffold (leadership, governance, innovation) with inductive openness to emergent categories such as barriers and future trajectories. Themes were refined iteratively until they offered a coherent, non-redundant account of the corpus.

3.9 Rigour and Trustworthiness

Several measures support the trustworthiness of the synthesis. Transparency was pursued by pre-specifying the protocol, documenting the search strings and eligibility criteria, and reporting the selection process through the PRISMA flow. Consistency in screening and extraction can be strengthened, in the executed review, by involving a second reviewer and calculating inter-rater agreement, with disagreements resolved through discussion. Credibility rests on grounding each theme in multiple independent studies rather than on isolated findings, and on retaining an audit trail linking codes to source material. Confirmability is served by distinguishing clearly between the evidence reported in the primary studies and the reviewer's interpretation of it. These practices align the review with recognised standards for qualitative evidence synthesis and provide a defensible basis for its conclusions.



4. Results and Discussion

The synthesis yielded five themes. The first three correspond to the review's core capabilities; the fourth consolidates cross-cutting barriers; and the fifth captures emerging trajectories. Each theme is presented with its principal findings and supporting studies, followed by an integrative discussion.

4.1 Theme 1 — Digital Leadership in Educational Institutions

Leadership emerged as the most consistently emphasised determinant of transformation. Studies converge on a multidimensional conception of the digital leader who combines a technology-enabled vision with the capacity to build staff competence and sustain change. Prayoonvong and Limwongthong (2025) distil five leadership dimensions—digital-competency integration, strategic crisis navigation, adaptive instructional leadership, student-centred digital pedagogies, and continuous professional self-development—and link leader proficiency to higher teacher satisfaction and transformation success. These dimensions map closely onto the pillars of digital leadership articulated by Sheninger (2019) and onto the distributed-leadership perspective (Spillane, 2006; Harris, 2013), which frames transformation as a coordinated organisational accomplishment rather than a solo endeavour.

Two implications follow. First, leadership competencies are learnable and therefore a legitimate target for professional development and selection, not an innate trait. Second, because leaders shape both governance structures and innovation culture, leadership functions as the pivotal mediator translating national policy into institutional capability—a pattern that recurs throughout the corpus and anchors the integrative model in Figure 3.

The corpus also surfaces the affective and relational work of digital leadership, which is easily overlooked in competency inventories. Leading transformation entails managing uncertainty, sustaining morale through repeated cycles of change, and modelling a disposition of learning rather than of mastery. Where leaders present themselves as continuous learners—openly experimenting, acknowledging limits, and inviting contribution—staff anxiety about digital change tends to diminish and collective efficacy to rise. Conversely, where digital initiatives are experienced as top-down impositions accompanied by surveillance, resistance and superficial compliance are common. The evidence thus positions trust as a critical mediating resource: the same technology can enable empowerment or control depending on the leadership posture through which it is introduced.

4.2 Theme 2 — Digital Governance and Policy Implementation

The second theme concerns the structures through which digitalisation is steered. Studies of institutional management models emphasise the modernisation of administrative systems, the strengthening of governance structures, and the promotion of data-driven decision-making as levers of institutional agility and accountability (Sirilak & Wannasri, 2023). National quality-assurance platforms exemplify the coupling of governance with digital infrastructure, embedding data collection and reporting into routine administration. Tungpantong et al. (2022) show that governance-related components load meaningfully within the broader digital-transformation construct for Thai higher education, situating governance as an integral rather than peripheral dimension.

At the same time, the literature signals tension. Governance-by-metrics can reshape professional priorities and identities, and the alignment between national mandates and institutional capability is uneven. Effective digital governance therefore requires more than platforms and dashboards; it depends on decision rights, data literacy, and a culture that uses analytics to inform judgement rather than to displace it. Governance maturity, in this reading, moderates whether digital investment yields coordinated action or fragmented duplication.

A further strand within this theme concerns policy implementation as a distinct governance challenge. National digital agendas are typically formulated centrally but must be enacted locally, and the fidelity of implementation varies with institutional capability, leadership commitment, and resource endowment. The Thai evidence documents a recurrent gap between the intent of reform and its realisation on the ground—consistent with Buasuwan's (2018) observation that ambition frequently outpaces capacity. Governance mechanisms that

build implementation capability—through capacity-building, phased mandates, and feedback loops between institutions and central authorities—appear more effective than those relying on compliance alone. This suggests that governance should be understood not merely as the exercise of control but as the orchestration of capability across a multi-level system.

4.3 Theme 3 — Institutional Innovation and Organisational Change

The third theme addresses how transformation is enacted through new practices, structures, and cultures. Thai scholarship increasingly frames the goal as a high-performance digital education organisation that integrates enterprise architecture, information-systems success, and human-performance considerations. Across studies, an innovation culture—norms that legitimise experimentation and collaboration—distinguishes institutions that embed change from those whose initiatives remain isolated pilots. This resonates with Fullan (2016), for whom coherence-making and capacity-building convert innovation into durable practice.

Organisational change, the studies suggest, is neither automatic nor purely technical. It requires deliberate attention to structures (how work is organised), capabilities (what staff can do), and meaning (why the change matters). Where these are aligned, digital learning ecosystems and smart-campus practices mature; where they are not, technology adoption produces surface-level digitisation without transformation.

The distinction between sustaining and disruptive innovation is instructive here. Much of the innovation documented in Thai institutions is sustaining—improving existing processes through digital tools such as learning-management systems, online enrolment, and automated reporting. Genuinely disruptive innovation, which reconfigures the model of teaching, credentialing, or institutional organisation, is rarer and more difficult, because it threatens established routines and interests. The evidence suggests that sustaining innovation is a necessary foundation but is insufficient on its own to constitute transformation; institutions that remain at the sustaining level risk optimising an unchanged model rather than reimagining it. The leadership and governance conditions that permit disruptive innovation to be attempted safely—protected space for experimentation, tolerance of intelligent failure, and strategic patience—therefore emerge as decisive, and as comparatively underdeveloped in the current literature.

4.4 Theme 4 — Challenges to Digital Transformation

A robust fourth theme catalogues persistent barriers. Foremost is the **rural–urban digital divide**, which produces marked disparities in infrastructure, connectivity, and digital literacy across institutions and regions. **Readiness gaps** among teachers and administrators recur as a limiting factor, consistent with acceptance-model predictions that perceived value and facilitating conditions govern adoption (Davis, 1989; Venkatesh et al., 2003). **Funding and resource constraints** restrict sustained investment, while **policy–implementation gaps** emerge where national ambition outpaces institutional capability (Buasuwan, 2018).

These barriers are interdependent: infrastructure deficits compound readiness gaps, which in turn blunt the returns on funding. Addressing them piecemeal is therefore unlikely to succeed. The synthesis suggests that equity-oriented, capability-building strategies—targeted at the institutions and regions furthest from the digital frontier—are prerequisites for system-wide transformation rather than optional add-ons.

Beyond these material and human-capital barriers, the literature identifies cultural and organisational sources of resistance that are easily underestimated. Established routines, professional identities, and informal power structures can quietly absorb or neutralise digital initiatives, so that change is announced but not enacted. Change fatigue—the exhaustion produced by successive, poorly sequenced reforms—further erodes the capacity to sustain transformation, particularly where staff perceive initiatives as transient or externally imposed. These findings reinforce the review's central claim that transformation is a leadership and governance challenge as much as a technological one: the barriers that matter most are frequently social rather than technical, and they yield to social rather than technical remedies—trust, participation, sequencing, and the visible alignment of change with educational purpose.



A further barrier evident across the reviewed studies concerns measurement and accountability. Many institutions lack agreed indicators of digital maturity, which makes it difficult for leaders to benchmark progress, justify continued investment, or identify which interventions are actually producing results. In the absence of shared metrics, digital-transformation initiatives risk being evaluated on visibility—the number of devices deployed or platforms adopted—rather than on demonstrated improvements in teaching, learning, or administrative effectiveness. This measurement gap compounds the equity and readiness challenges already noted, because institutions that most need support are also the least able to demonstrate, in quantifiable terms, the value of receiving it.

Addressing this gap will require coordinated, sustained action from ministry bodies, quality-assurance agencies, and institutional leaders to co-develop shared digital-maturity indicators that are meaningful across diverse institutional types and regional contexts, rather than imposed uniformly without regard for starting-point disparities. Piloting such indicators in a small number of volunteer institutions before wider rollout would allow refinement based on real implementation experience.

4.5 Theme 5 — Future Trends and Emerging Directions

The fifth theme identifies the trajectories toward which the field is moving. Artificial intelligence and learning analytics feature prominently as tools for personalisation, early-warning systems, and administrative decision support. Smart-school and smart-campus models continue to mature, integrating connected infrastructure with data-informed management. Increasingly, the discourse extends toward Education 5.0, which augments the digital emphasis of Education 4.0 with a renewed focus on human-centredness, values, creativity, and well-being—positioning technology as an enabler of humane, personalised education rather than an end in itself.

These trajectories raise governance and ethical questions—around data privacy, algorithmic transparency, and equitable access—that the current Thai literature addresses only partially, signalling a priority for future inquiry.

The movement toward Education 5.0 warrants particular attention because it reframes the purpose of digital transformation itself. Where Education 4.0 emphasised the integration of advanced technologies and the cultivation of digital competencies for a technology-driven economy, Education 5.0 re-centres the human: creativity, ethics, empathy, well-being, and personalisation become the ends that technology serves. For educational management, this implies that the metrics of successful transformation should extend beyond efficiency and connectivity to include learner flourishing, equity, and the quality of the human relationships that education depends upon. This humanistic turn is only beginning to register in the Thai literature, and it invites a reconsideration of the leadership and governance capabilities the coming decade will require—capabilities oriented as much toward values and judgement as toward systems and data.

4.6 Discussion

Read together, the themes support three overarching claims. First, digital transformation in Thai educational management is a socio-technical, leadership-driven process, not a technology-procurement event—consistent with Vial (2019) and with the strategy-first argument of Kane et al. (2015). Second, the three capabilities are complementary: leadership without governance produces vision without structure; governance without innovation produces control without renewal; and innovation without leadership produces pilots without scale. Third, equity is constitutive rather than incidental: the rural–urban divide conditions the system-level returns to any transformation strategy.

Compared with the broader international and Southeast Asian literature, the Thai evidence is distinctive in its strong coupling of transformation to national economic policy (Thailand 4.0) and to centralised quality-assurance infrastructures, and in its explicit engagement with cultural context. It converges with global findings on the primacy of leadership and culture, but diverges in the salience of policy–capability alignment and regional disparity. Relative to established educational-management theory, the synthesis reinforces the enduring insight

that leadership effects operate through capacity and commitment (Leithwood et al., 2020), while extending it to the digital domain by specifying the governance and innovation conditions under which digital leadership becomes consequential.

The synthesis also invites reflection on methodology within the field. The predominance of cross-sectional, self-report, and instrument-validation designs limits causal inference and privileges a snapshot view of what is inherently a longitudinal process. Few studies trace institutions over time or triangulate perceptual data with organisational performance, and fewer still examine the mechanisms—rather than merely the correlates—of transformation. Strengthening the evidence base will require designs capable of capturing dynamics, context, and causality: longitudinal case studies, multilevel modelling that respects the nesting of individuals within institutions within regions, and mixed-methods work that pairs measurement with meaning. Such methodological maturation is the precondition for advancing from description toward explanation and, ultimately, toward actionable guidance for Thai educational managers.

Several limitations of the present review should temper its conclusions. The restriction to English-language sources may under-represent Thai-language scholarship and practitioner knowledge; the reliance on published literature introduces potential publication bias toward positive or novel findings; and thematic synthesis, while well suited to heterogeneous evidence, involves interpretive judgement that other reviewers might exercise differently. The illustrative status of the screening counts, moreover, means that the quantitative profile of the corpus reported here is provisional pending the executed search. These limitations do not undermine the review's substantive claims, which rest on convergent findings across multiple independent studies, but they do define the confidence with which those claims should be held and the care with which they should be extended.

The findings also carry implications beyond the Thai higher-education sector narrowly conceived. Basic and secondary education systems, technical-vocational institutions, and non-formal education providers face structurally similar tensions between centralised policy ambition and uneven local capacity, suggesting that the leadership-governance-innovation framework developed here may transfer, with appropriate adaptation, to those settings. Regionally, Thailand's experience offers a comparative reference point for other ASEAN member states pursuing analogous digital-economy and education-modernisation agendas, particularly those that combine strong central planning with decentralised service delivery, such as Indonesia, Vietnam, and the Philippines. Cross-national comparative work that tests whether the themes identified here recur, attenuate, or take different form under different governance traditions, linguistic contexts, and levels of economic development would meaningfully extend the generalisability of the present synthesis and help distinguish features of digital transformation that are genuinely universal from those that are artefacts of the Thai policy environment.

Summary Table. Themes, Key Findings, and Implications

Theme	Key Findings	Implications
1. Digital leadership	Multidimensional leader competencies (vision, crisis navigation, pedagogy, self-development) predict transformation success; leadership mediates policy→capability.	Invest in leadership development and selection; treat competencies as learnable.
2. Digital governance	Data-driven decision-making, modern administrative systems, and QA platforms enable agility; governance-by-metrics carries risks.	Build decision rights and data literacy; use analytics to inform, not replace, judgement.
3. Institutional innovation	Innovation culture distinguishes embedded change from isolated pilots; enterprise architecture and ecosystems support high performance.	Cultivate experimentation norms; align structures, capabilities, and meaning.

4. Challenges	Rural–urban divide, readiness gaps, funding limits, and policy–implementation gaps interact and compound.	Adopt equity-first, capability-building strategies targeting lagging institutions.
5. Emerging directions	AI, learning analytics, smart campuses, and Education 5.0 (human-centred) define the frontier.	Develop data-ethics governance; prepare leaders for AI-enabled management.

5. Conclusion

This systematic review synthesised the 2015–2026 literature on digital transformation in Thai educational management through the integrated lens of leadership, governance, and institutional innovation. The evidence indicates that transformation is a socio-technical process in which leadership supplies vision and mobilisation, governance supplies structure and accountability, and innovation supplies the practices through which change is enacted. Leadership recurs as the pivotal mediator translating national policy into institutional capability; governance maturity and innovation culture determine whether digital investment yields coordinated organisational value; and the rural–urban divide conditions the equity and reach of transformation across the system.

For leadership, the practical message is that digital-leadership competencies are learnable and consequential and therefore warrant deliberate development. For governance, the message is that data-driven administration must be matched by decision rights, data literacy, and values-sensitive use of metrics. For innovation, the message is that an experimentation culture and coherence-making distinguish embedded transformation from isolated pilots. Together these findings offer both an explanatory account and a practical agenda for Thai educational institutions navigating digital change.

More broadly, the review invites a reframing of how success in digital transformation is conceived. If transformation is a socio-technical and leadership-driven process rather than a procurement event, then its success cannot be measured by technology deployed or connectivity achieved alone. It must be judged by whether institutions have built the leadership, governance, and innovation capabilities that allow them to keep adapting—and by whether the benefits of adaptation reach learners equitably across the metropolitan centre and the rural provinces. As Thai education moves from the technology-centred aspirations of Education 4.0 toward the human-centred commitments of Education 5.0, this capability-and-equity conception of success offers a more durable compass than metrics of adoption, and a more faithful guide to the purpose that education ultimately serves.

6. Recommendations

For policymakers

- Pair national digital mandates with capability-building and financing mechanisms targeted at lagging institutions and regions to close the rural–urban divide.
- Embed data-ethics and privacy governance into national quality-assurance and analytics platforms.

For educational leaders

- Treat digital-leadership competencies as core to selection and professional development; distribute leadership across cross-functional teams.
- Align structures, capabilities, and meaning when introducing innovations so that pilots scale into embedded practice.

For schools and universities

- Invest in staff readiness and facilitating conditions, recognising that adoption depends on perceived value and support, not mandate alone.



- Cultivate an innovation culture that legitimises experimentation and collaborative problem-solving.

For researchers

- Prioritise longitudinal and mixed-methods designs that trace transformation over time and across institutional levels.
- Develop and validate integrated, theory-driven models linking leadership, governance, and innovation to organisational outcomes in the Thai context.
- Extend the geographic and linguistic scope of future syntheses to include Thai-language grey literature, ministry reports, and institutional self-studies, which likely capture practitioner knowledge absent from the indexed English-language corpus.
- Pursue comparative, multi-country designs situating Thailand alongside other ASEAN systems to test the transferability of the leadership-governance-innovation framework beyond a single national policy environment.

7. Research Gaps and Future Agenda

The synthesis exposes several gaps that define a forward agenda for the field.

Table 3. Research Gaps and Future Research Directions

Research Gap	Future Research Direction
Predominance of cross-sectional, descriptive designs	Longitudinal and process studies tracing how transformation unfolds over time.
Fragmented treatment of leadership, governance, and innovation	Integrated, theory-driven models tested with SEM or multilevel methods.
Under-representation of basic education and rural institutions	Comparative studies across institutional levels and regions, with equity focus.
Limited attention to AI and data ethics	Governance frameworks for AI, learning analytics, privacy, and algorithmic transparency.
Weak linkage to organisational outcomes	Studies connecting transformation capabilities to measurable effectiveness and learner outcomes.
Sparse engagement with Education 5.0 and human-centredness	Conceptual and empirical work on humane, values-based digital transformation.

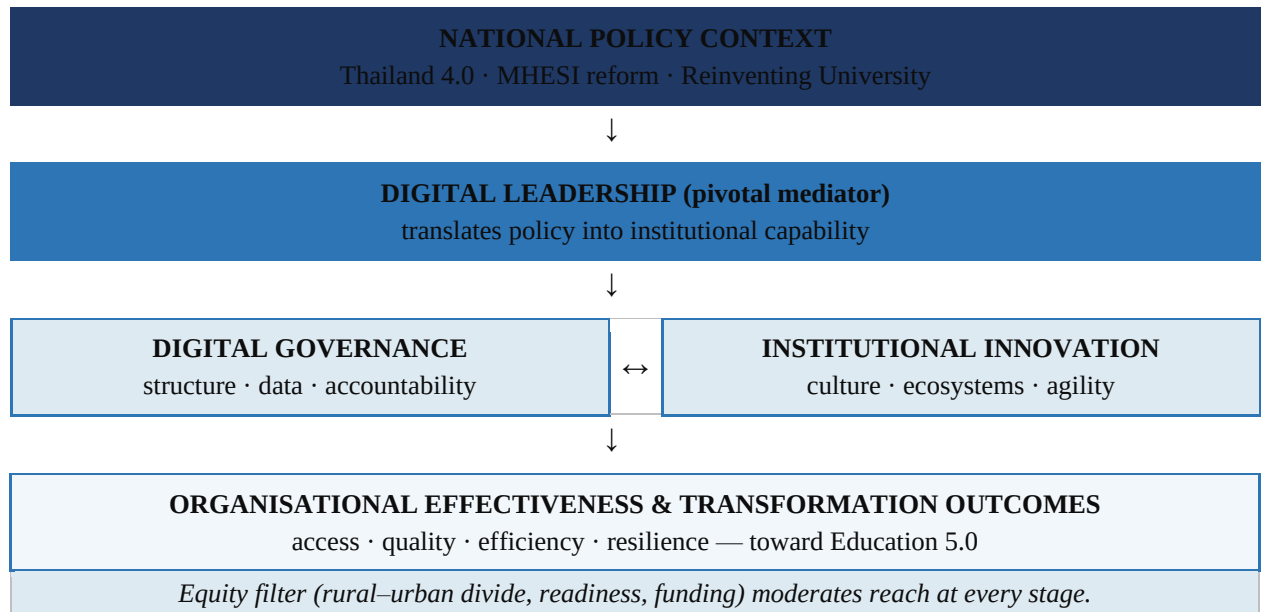
**Additional Outputs: Tables and Figures****Table 1. Characteristics of Included Studies (representative verified entries)**

Note. The entries below are real, verified studies retrieved during scoping and are provided as a representative sample. Populate the remaining rows with the full set of studies from your executed search before submission.

Study	Level / Region	Method / Sample	Focus & Key Finding
Prayoonvong & Limwongthong (2025)	Basic ed. / Bangkok	Mixed (n=342; 38 interviews)	Leadership — five digital-leadership dimensions predict transformation success.
Tungpantong, Nilsook & Wannapiroon (2022)	Higher ed. / national	CFA (n=300)	Governance/innovation — multi-component DT construct validated for Thai HEIs.
Laorach & Tuamsuk (2022)	Higher ed. / national	Survey	Innovation — factors influencing DT of Thai universities identified.
Sirilak & Wannasri (2023)	Higher ed. / national	Model development	Governance — management model for HEIs in the digital era.
Sukkerd & Khongmalai (2022)	Higher ed. / national	Qualitative	Governance — IT-staff competency development for university DT.
Ngampornchai & Adams (2016)	Higher ed. / NE Thailand	Survey	Readiness — student acceptance and e-learning readiness.
Buasuan (2018)	System / national	Conceptual	Policy — gap between Thailand 4.0 goals and institutional capacity.
Singun (2025)	Higher ed. / international	Systematic review	Barriers — multi-dimensional barriers to DT in HEIs.

Table 2. Thematic Coding Matrix

Theme	Representative Codes	Illustrative Sources
Digital leadership	digital vision; competency integration; crisis navigation; distributed leadership; professional growth	Prayoonvong & Limwongthong (2025); Sheninger (2019); Spillane (2006)
Digital governance	data-driven decisions; QA platforms; decision rights; governance-by-metrics; policy alignment	Sirilak & Wannasri (2023); Tungpantong et al. (2022)
Institutional innovation	innovation culture; enterprise architecture; digital ecosystem; organisational agility	Fullan (2016); Laorach & Tuamsuk (2022)
Challenges	rural–urban divide; readiness gaps; funding limits; policy–implementation gap	Buasuan (2018); Singun (2025)
Emerging directions	AI; learning analytics; smart campus; Education 5.0; data ethics	Vial (2019); Rogers (2003)

Figure 3. An Emerging Model of Digital Transformation in Thai Educational Management


The model positions digital leadership as the mediator between national policy and the reciprocal governance–innovation engine that drives outcomes, filtered by equity conditions.



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