REVIEW ARTICLE

# Governance and Risk Management Frameworks for Digital Transformation in Higher Education: A Comparative Review

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## Abstract

*Purpose – The digital transformation of higher education introduces institutional risks that existing governance frameworks are not always equipped to manage. While the literature on educational technology has grown substantially, the intersection between digitalization, change management, and risk governance in the university context remains underexplored. This review examines how three classical change management models – Kotter's eight-step process, Lewin's Unfreeze-Change-Refreeze cycle, and Hiatt's ADKAR framework – can be adapted as risk governance instruments for managing digital transformation in universities. Methodology – Using a narrative literature review of 48 sources (2017–2025) identified through systematic database searches, combined with a comparative analysis of two vocational training projects (HOLOTRAIN and We Grow People), the study identifies eight risk categories specific to educational digitalization and assesses three change management models across six governance dimensions. Findings – The comparative assessment reveals that no single framework is sufficient; hybrid approaches that combine Kotter's emphasis on urgency and coalition-building, Lewin's attention to cultural anchoring, and ADKAR's focus on individual readiness produce the most sustainable results. Implications – Five strategic recommendations for university leaders are proposed: developing a coherent institutional digital vision, strengthening staff digital competencies, institutionalizing ethics committees, adopting adaptive hybrid change management, and establishing monitoring systems with measurable indicators tied to specific risk categories.*

**Keywords:** digital transformation; higher education governance; change management; institutional risk; educational technology; ethical governance

**JEL Classification:** I23; M10; O33; D81

## 1. INTRODUCTION

The digital transformation of higher education is no longer an optional modernization step. It represents a structural reconfiguration of universities in response to the pressures of a knowledge-based economy, accelerated by the rapid development of artificial intelligence (AI), augmented and virtual reality (AR/VR), and adaptive learning platforms (Lima et al., 2024; Mustafa, 2025; Salmon, 2019). European policy frameworks, particularly the Digital Education Action Plan 2021 to 2027, have set ambitious targets for digital competence, infrastructure, and pedagogical innovation across member states. Yet institutional adoption has been uneven, and the management of associated risks remains fragmented.

From a governance perspective, digital transformation introduces a range of institutional risks that university leaders must identify, assess, and mitigate. These include data protection obligations under GDPR, the risk of algorithmic bias in AI-assisted assessment, digital exclusion of students and staff with unequal access to technology, threats to academic integrity from generative AI, and cultural resistance within academic communities accustomed to traditional pedagogies (Abuadas et al., 2025; Zainuddin and Hamdani, 2025). The management of these risks requires more than technological expertise; it demands governance frameworks that integrate strategic leadership, ethical oversight, and organizational change management. The growing body of work on AI governance in education (UNESCO, 2021; Holmes et al., 2022; Pedro et al., 2019) has begun to articulate the principles that should guide institutional responses, but the connection between these principles and operational change management practice is still weak.

Classical change management models offer useful starting points. Kotter's (1996) eight-step process emphasizes urgency, coalition-building, and cultural embedding. Lewin's (1951) Unfreeze-Change-Refreeze model provides a gradual structuring approach well suited to institutions with strong traditions. Hiatt's (2006) ADKAR framework focuses on individual readiness, addressing the personal dimensions of awareness, desire, knowledge, ability, and reinforcement that determine whether organizational change is adopted or resisted. While these models were not designed specifically for educational contexts, their principles are increasingly applied to university digitalization, though rarely with explicit attention to the risk dimension (Dongare and Gaikwad, 2023; Sisouvong and Pasanchay, 2024). Critical reviews of change management theory (By, 2005; Stouten et al., 2018) have argued that contingency-based approaches, rather than rigid adherence to any single model, are more likely to succeed in complex institutional environments.

This review addresses the gap between the educational technology literature, which focuses predominantly on pedagogical outcomes, and the risk governance literature, which has given limited attention to higher education. The objectives are threefold. First, to identify and categorize the institutional risks associated with digital transformation in universities. Second, to comparatively assess three classical change management models as potential risk governance frameworks for

 

educational digitalization. Third, to synthesize strategic recommendations that connect risk identification with managerial intervention, drawing on both the theoretical literature and on practical experience from vocational training projects that provide transferable lessons for the university sector.

The structure of the paper is as follows. Section 2 reviews the literature on digitalization, change management, and risk dimensions in higher education. Section 3 describes the methodology, including the search strategy and analytical framework. Section 4 presents results, including the comparative model assessment and case study analysis. Section 5 discusses implications. Section 6 concludes with strategic recommendations.

## 2. LITERATURE REVIEW

### 2.1. Digital Transformation and Institutional Risk in Higher Education

The Education 4.0 paradigm has shifted the discourse from whether universities should adopt digital technologies to how they should manage the transformation process (Lima et al., 2024; Salmon, 2019). Recent systematic reviews confirm that AI applications in higher education have expanded rapidly, touching assessment, content delivery, student support, and institutional administration (Crompton and Burke, 2023; Chiu et al., 2023). AI contributes to personalized learning through adaptive feedback, automated assessment, and conversational tutoring (Abuadas et al., 2025; Zainuddin and Hamdani, 2025). AR and VR create immersive learning environments in fields ranging from medicine and engineering to hospitality and customer service (Wang, 2024; Salvetti et al., 2025). Text-to-speech technologies and AI-driven avatars extend access for students with disabilities or diverse learning styles (Salvetti et al., 2025). Each of these technologies offers pedagogical benefits, but each also introduces specific institutional risks that require governance attention.

Selwyn (2019) argues that educational technology discourse tends to emphasize optimistic narratives of transformation while underplaying the structural, political, and ethical challenges that implementation entails. Williamson (2020) extends this critique to the platform economy in education, showing how digital infrastructure choices create dependencies on commercial providers that limit institutional autonomy. Bond et al. (2024) reinforce this point through a systematic review showing that successful digital adoption depends not on the technology itself but on the institutional capacity to integrate it into existing pedagogical and governance structures. Tondeur et al. (2017) demonstrate, through a synthesis of qualitative studies, that teacher beliefs about pedagogy and technology interact with institutional support structures in determining whether digital tools are adopted substantively or merely symbolically. This finding has direct governance implications: universities that invest in infrastructure without addressing the belief systems and professional identities of their teaching staff risk producing compliance without commitment. Mustafa (2025) positions digital leadership as the critical mediating variable: leaders who can articulate coherent visions, ensure continuous staff

 

training, and balance innovation with academic tradition are more likely to achieve sustainable transformation.

The risk dimension of educational digitalization has received growing but still insufficient attention. Data protection represents the most legally formalized risk category, with GDPR compliance imposing obligations on how student data are collected, stored, processed, and shared (European Commission, 2021). The practical challenges of implementing GDPR in university digital learning environments are considerable: learning analytics systems routinely collect granular behavioral data, and the boundaries between educational purpose and surveillance are not always clear (Prinsloo and Slade, 2016; Tsai and Gasevic, 2017). Universities must navigate the tension between the pedagogical value of data-driven personalization and the privacy rights of students, a balance that requires governance structures capable of making context-sensitive decisions rather than applying blanket rules.

Algorithmic bias in AI-assisted assessment creates risks of unfair grading or resource allocation that are difficult to detect without dedicated audit mechanisms (Holmes et al., 2022; Zawacki-Richter et al., 2019; Swiecki et al., 2022). The problem is not limited to assessment: recommendation systems, automated feedback tools, and adaptive learning platforms all embed assumptions about what constitutes effective learning, and these assumptions may systematically disadvantage certain student populations (Gonzalez-Calatayud et al., 2021). Mittelstadt (2019) argues that ethical principles alone are insufficient without institutional mechanisms for translating principles into practice, including regular algorithmic audits, transparent reporting, and accessible complaint procedures. This observation applies with particular force to higher education, where the consequences of biased automated decisions can affect academic progression, financial support, and career trajectories.

Digital exclusion affects students and staff who lack access to hardware, connectivity, or digital skills, potentially exacerbating rather than reducing existing inequalities (Solarte Chapi et al., 2025). Generative AI raises concerns about academic integrity that institutions are only beginning to address through formal policies (Zainuddin and Hamdani, 2025). Cultural resistance among faculty, particularly in institutions with strong traditional identities, can undermine adoption even when technical infrastructure is adequate (Sisouvong and Pasanchay, 2024). Shattock (2013) observes that universities operate under governance structures that distribute authority across multiple centres of decision-making, which makes coordinated responses to technological disruption inherently difficult.

### 2.2. Change Management Models for Educational Digitalization

Change management provides the theoretical infrastructure for understanding how organizations transition from current to desired states, and the frameworks developed in the business management literature have increasingly been applied to educational settings (Dongare and Gaikwad, 2023). Critical reviews of this transfer (By, 2005; Stouten et al., 2018) caution that change management

 

models developed in corporate contexts do not always translate straightforwardly to organizations with different authority structures, professional cultures, and accountability mechanisms.

Kotter's (1996) eight-step model begins with creating a sense of urgency, proceeds through coalition-building and vision communication, and concludes with anchoring changes in organizational culture. Its strength lies in mobilizing institutional leadership and generating momentum for reform. Applied to university digitalization, it supports the rapid deployment of new technologies and the political management of stakeholder resistance. Its limitation is that it presupposes a degree of hierarchical authority that many academic institutions, with their collegial governance traditions, may not possess (Dongare and Gaikwad, 2023). Appelbaum et al. (2012) note that Kotter's model has been widely adopted but rarely subjected to rigorous empirical testing, and that its sequential logic may oversimplify the iterative reality of organizational change.

Lewin's (1951) three-phase model of Unfreeze-Change-Refreeze offers a more gradual approach. The unfreezing phase prepares the organization for change by challenging existing norms; the change phase introduces new practices; the refreezing phase stabilizes the new state as the institutional norm. This framework is well suited to universities with strong traditions and a need for progressive rather than disruptive reform. Its risk governance potential lies in the emphasis on cultural stabilization: by insisting that change must be anchored before moving forward, Lewin's model reduces the risk of superficial adoption that reverts under pressure (Sisouvong and Pasanchay, 2024). Burnes (2004) provides a re-appraisal of Lewin's work that challenges the common characterization of it as static or simplistic, arguing instead that Lewin's approach was fundamentally concerned with the dynamics of group behaviour and the conditions under which lasting change becomes possible.

Hiatt's (2006) ADKAR model shifts the focus from organizational to individual readiness. The five elements – Awareness of the need for change, Desire to participate, Knowledge of how to change, Ability to implement, and Reinforcement to sustain – provide a structured approach to addressing the personal barriers that often determine whether institutional change succeeds or fails. In educational contexts, ADKAR is particularly relevant for managing the digital skill gaps and attitudinal resistance that faculty may exhibit when confronted with AI tools or immersive technologies (Ahmad and Mohebi, 2025). The model's limitation, however, is that it operates at the individual level and does not generate the institutional vision or strategic direction that digital transformation requires. When individual readiness is high but institutional direction is absent, ADKAR offers no mechanism for resolving the gap, a scenario that is not uncommon in loosely coupled organizations like universities where faculty may be individually willing to innovate but lack a coordinated institutional framework for doing so (Kezar, 2018; Errida and Lotfi, 2021).

The emerging consensus in the literature is that no single model is sufficient for managing the complexity of university digitalization. Hybrid approaches that draw selectively on the strengths of each framework are more likely to produce sustainable outcomes (Dongare and Gaikwad, 2023; Sisouvong and Pasanchay, 2024). This consensus aligns with the broader argument in organizational

 

theory that effective change management requires contingency thinking rather than adherence to any single prescriptive framework (Burnes, 2004; Stouten et al., 2018).

### 2.3. Ethical Governance and the Risk Landscape

Ethical governance structures are essential for maintaining institutional legitimacy during digital transformation. The creation of ethics committees, digital observatories, and regular evaluation mechanisms ensures that technological adoption proceeds within boundaries that the academic community considers legitimate (Abuadas et al., 2025). Holmes et al. (2022) provide a framework for ethical AI in education, identifying transparency, fairness, accountability, and human oversight as core principles. The OECD (2023) reinforces these principles at the policy level, calling for governance frameworks that ensure AI systems in education are explainable, contestable, and regularly audited for fairness. UNESCO (2021) articulates a similar set of requirements, emphasizing that AI governance in education must protect human agency, ensure inclusiveness, and maintain transparency in how automated decisions affect learning outcomes.

Floridi et al. (2018) propose a broader ethical framework for AI that identifies five principles – beneficence, non-maleficence, autonomy, justice, and explicability – which apply with particular force in educational settings where automated systems interact with vulnerable populations. The European Commission (2022) has issued specific ethical guidelines for AI and data use in teaching and learning, reflecting the growing policy recognition that educational AI governance requires sector-specific frameworks rather than generic technology regulation. Pedro et al. (2019) translate these principles into policy guidance for educational institutions, noting that the rapid pace of AI deployment in education has outpaced the development of governance frameworks capable of ensuring responsible use. The risk management literature (ISO, 2018; COSO, 2017) provides established methodologies for systematic risk identification, assessment, and treatment that could be adapted to the educational digitalization context, but this adaptation has not yet been undertaken systematically in the higher education literature.

Vasile and Croitoru (2021) discuss governance transparency and institutional accountability in the context of audit practices, principles that apply directly to how universities should govern their digital transformation. Vasile and Pantazi (2021) extend this to financial reporting standards, arguing that standardized accountability frameworks are preconditions for institutional trust, a point equally valid for the governance of educational technology budgets and outcomes. Luckin et al. (2016) argue that AI in education requires not just ethical guidelines but institutional infrastructure for ongoing monitoring, evaluation, and adjustment, an argument that connects ethical governance to the risk management function.

 

## 3. METHODOLOGY

This study employs a qualitative approach combining a narrative literature review with comparative case study analysis. The design is exploratory and interpretive, aimed at developing a strategic framework for risk governance in university digital transformation rather than testing specific hypotheses.

The literature search was conducted between January and March 2026 using four electronic databases: Scopus, Web of Science, Google Scholar, and ERIC. The search combined terms from three thematic clusters: (1) digitalization and educational technology ("digital transformation," "educational technology," "AI in education," "augmented reality," "virtual reality"); (2) change management ("change management," "Kotter," "Lewin," "ADKAR," "organizational change"); and (3) higher education governance and risk ("higher education governance," "institutional risk," "risk management," "ethical governance," "data protection"). Boolean operators AND and OR were used to combine clusters. The primary search window covered 2019 to 2025, with three foundational works (Kotter, 1996; Lewin, 1951; Hiatt, 2006) included regardless of date. Inclusion criteria required that sources be published in English, available through DOI or open access, and directly relevant to at least two of the three thematic clusters. Sources focused exclusively on K-12 education, purely technical system descriptions, or non-peer-reviewed opinion pieces were excluded. An initial pool of approximately 120 records was screened by title and abstract, yielding 58 sources for full-text review, of which 48 were retained in the final reference list based on their direct contribution to the analytical framework.

Two case studies were selected for comparative analysis: the HOLOTRAIN platform, an EU-funded project integrating holographic simulations and AI for vocational training, and We Grow People, a multi-stakeholder initiative combining AI and AR/VR with equity-focused implementation in vocational education. Although both projects belong to vocational training rather than higher education, they were selected for the transferability of their governance models and their relevance to the risk dimensions under investigation. Information about both projects was drawn from the author's direct participation in their advisory and implementation activities, supplemented by project documentation including deliverable reports, consortium meeting records, and pilot evaluation summaries. The author's involvement is disclosed in the Acknowledgments section.

The analysis proceeded in four stages: (1) thematic coding of recurring concepts across the literature; (2) mapping coded themes to the three change management models; (3) comparative analysis of the case studies across governance, technology, and risk management dimensions; and (4) synthesis of findings into a strategic framework with five actionable recommendations.

The comparative model assessment in Table 2 was conducted by the author based on a structured evaluation of each model against six governance dimensions derived from the literature. Qualitative ratings (Strong, Moderate, Weak) were assigned based on the following criteria: Strong

 

indicates that the model explicitly and substantively addresses the dimension as a core component; Moderate indicates partial or indirect coverage; Weak indicates that the dimension is not a central feature of the model. The numerical scores in Figure 2 translate these ratings on a 1-to-5 scale (Weak = 1–2, Moderate = 3, Strong = 4–5) to enable visual comparison. These are interpretive assessments grounded in the reviewed literature, not empirical measurements, and should be understood accordingly.

Limitations include the narrative rather than systematic nature of the review, which means the literature base, while substantially broader than the initial submission, is not exhaustive. The two case studies originate in vocational training rather than higher education, which limits direct transferability despite the governance analogies drawn. The comparative model assessment involves qualitative judgements that, while grounded in the literature, are not derived from empirical measurement. These limitations are mitigated by reliance on established theoretical models and by the comparative design that triangulates findings across multiple sources.

## 4. RESULTS

### 4.1. Risk Categories in Educational Digital Transformation

The literature review identifies eight distinct risk categories associated with digital transformation in higher education, presented in Table 1. These categories emerged from the thematic coding of the reviewed sources and reflect the areas where governance attention is most needed.

**Table 1. Risk categories in educational digital transformation**

| Risk Category | Description | Primary Sources |
|---|---|---|
| Data protection | GDPR compliance, student data privacy, learning analytics surveillance risks | European Commission, 2021; Holmes et al., 2022; Prinsloo and Slade, 2016 |
| Algorithmic bias | Unfair assessment or resource allocation through biased AI systems | Holmes et al., 2022; Zawacki-Richter et al., 2019; Mittelstadt, 2019 |
| Digital exclusion | Unequal access to technology among students and staff | Solarte Chapi et al., 2025; Mustafa, 2025 |
| Academic integrity | Generative AI threats to original work and examination validity | Zainuddin and Hamdani, 2025 |
| Cultural resistance | Faculty opposition to pedagogical change and digital tools | Sisouvong and Pasanchay, 2024; Dongare and Gaikwad, 2023 |
| Infrastructure failure | Technical system breakdowns, connectivity gaps, platform instability | Bond et al., 2024 |
| Staff skill gaps | Insufficient digital competencies among teaching and administrative staff | Ahmad and Mohebi, 2025; Solarte Chapi et al., 2025 |

 

| | | |
|---|---|---|
| Vendor dependency | Lock-in to proprietary platforms limiting institutional autonomy | Selwyn, 2019; Williamson, 2020 |

*Source: Author's synthesis based on the reviewed literature.*

These risk categories are mapped in Figure 1 according to their estimated probability and impact on institutional objectives. The positioning reflects the author's assessment based on the frequency and severity of each risk as reported across the reviewed sources. Data protection and algorithmic bias are positioned as high-impact risks due to their legal and ethical consequences, while cultural resistance and staff skill gaps are estimated as having high probability given the well-documented challenges of institutional change in academic settings.

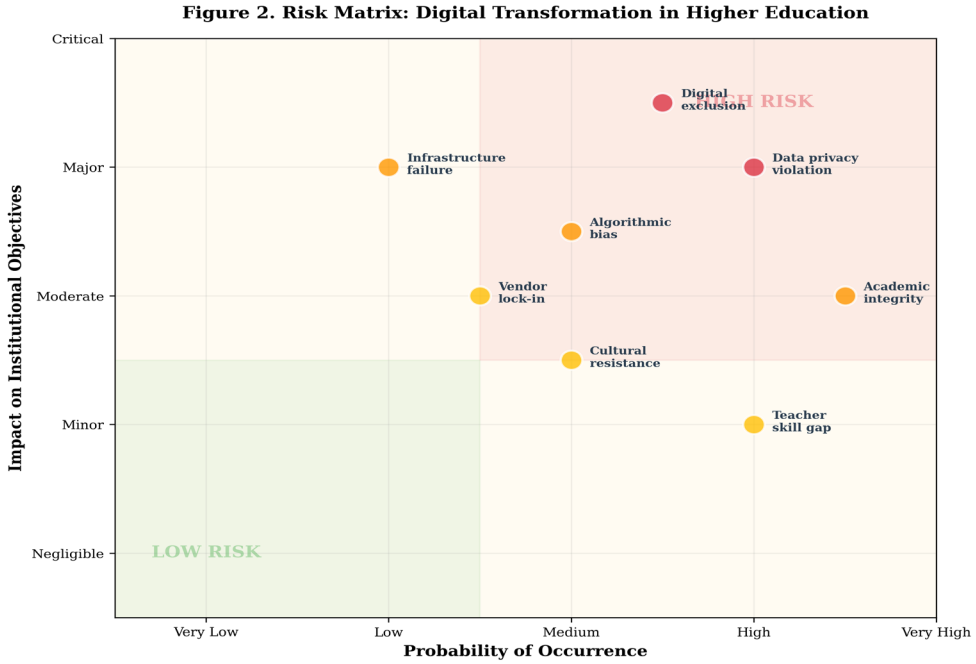


Figure 1. Risk matrix: digital transformation in higher education. Risks are positioned by estimated probability of occurrence and impact on institutional objectives. Source: Author's own elaboration based on the reviewed literature.

### 4.2. Comparative Assessment of Change Management Models

The three models are assessed across six governance dimensions relevant to university digital transformation. The dimensions were derived from the literature: leadership focus (the extent to which the model prioritizes institutional leadership), cultural anchoring (attention to embedding change in organizational culture), individual adaptation (focus on personal readiness), risk identification (explicit attention to identifying and addressing risks), flexibility (capacity for iterative application), and scalability (suitability for large, complex organizations). The results are presented in Table 2 and visualized in Figure 2.

**Table 2. Comparative assessment of change management models for university digitalization**

| Dimension | Kotter (1996) | Lewin (1951) | ADKAR (Hiatt, 2006) |
|---|---|---|---|

 

| | | | |
|---|---|---|---|
| Leadership focus | Strong: urgency, coalitions, vision | Moderate: requires champion but less structured | Weak: individual-centered, not leader-driven |
| Cultural anchoring | Moderate: final step is embedding | Strong: refreezing stabilizes new norms | Moderate: reinforcement sustains individually |
| Individual adaptation | Weak: organizational, not personal | Moderate: acknowledges personal transition | Strong: explicit personal readiness stages |
| Risk identification | Moderate: urgency implies risk awareness | Weak: not explicitly risk-oriented | Strong: knowledge/ability stages reveal gaps |
| Flexibility | Low: sequential, rigid structure | Moderate: three phases allow adaptation | High: non-sequential, iterative application |
| Scalability | Strong: designed for large organizations | Moderate: better for cohesive groups | Moderate: scales through aggregation |

*Source: Author's comparative assessment based on the reviewed literature.*

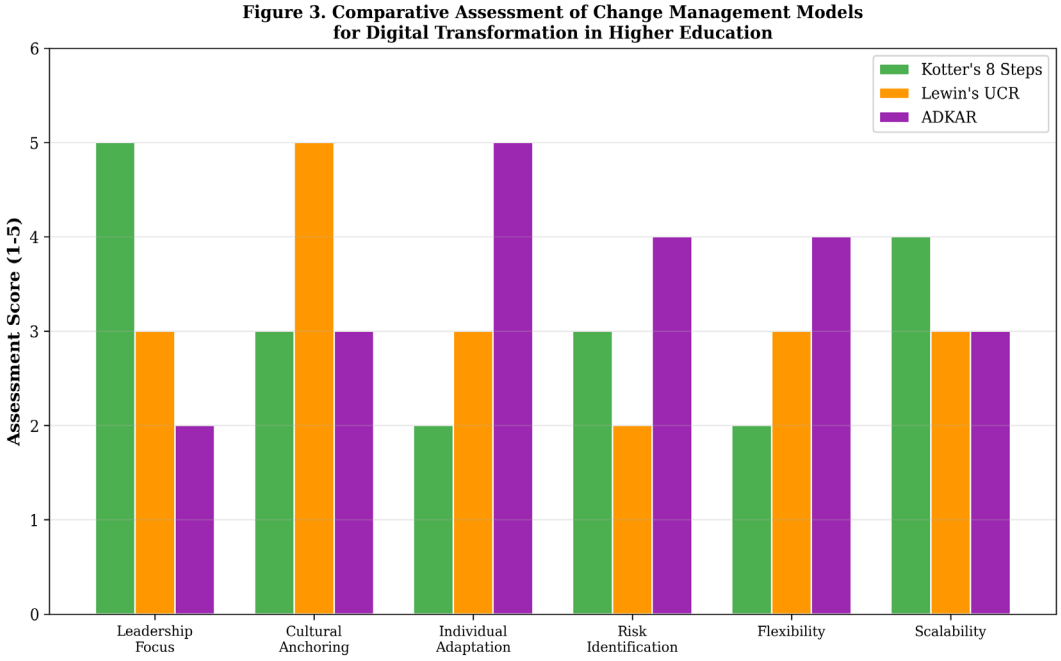


Figure 2. Comparative assessment of change management models across six governance dimensions (scores 1 to 5). Source: Author's own elaboration.

The comparative analysis confirms that each model addresses a different aspect of the governance challenge. Kotter provides the strongest framework for institutional mobilization but lacks attention to individual readiness. Lewin excels at cultural integration but offers limited tools for risk identification. ADKAR addresses the personal dimension most effectively but presupposes organizational direction that it does not itself generate. These complementarities support the case for hybrid approaches.

 

### 4.3. Case Study Evidence

Two vocational training projects illustrate how digital transformation governance operates in practice. The author's involvement in advisory and implementation capacities for both projects provides access to operational detail that is not available in published sources; this relationship is disclosed here and in the Acknowledgments section. The evidential weight of this section should be understood accordingly: it draws on first-hand observation and project documentation rather than independently published evaluations.

The We Grow People project, implemented across multiple European vocational training centres, exemplifies an equity-focused governance approach. Partnerships between schools, local authorities, and technology providers created digital ecosystems where learners practiced industrial procedures in simulated environments. AI enabled personalized learning pathways, while AR/VR provided realistic scenarios for construction, hospitality, and engineering. Teacher training was central: instructors were repositioned as digital facilitators. Governance relied on distributed partnerships with emphasis on inclusion and sustainability. Outcomes included higher student engagement, improved performance, and increased certification pass rates. The project demonstrates that even advanced technologies can be implemented within existing institutional networks when governance prioritizes accessibility and gradual integration.

The HOLOTRAIN platform represents a contrasting model. Developed through an EU-funded consortium, it integrates photorealistic holograms into augmented environments, with an AI module that adjusts content based on biometric indicators of stress, concentration, and engagement. Applied in soft skills training, medical education, and crisis management, pilot evaluations conducted within the consortium showed completion rates above 90% and improvements in transversal competencies. Governance was centralized under the consortium, with multidisciplinary teams including neuroscience and machine learning specialists. Performance was monitored through specific KPIs. The project illustrates the potential of radical technological innovation when supported by dedicated governance structures and substantial investment.

Together, the two projects demonstrate complementary strategic paths: one focused on equity and accessibility within existing structures, the other on disruptive innovation through dedicated infrastructure. Both, however, share a common governance feature that is relevant to the higher education context: explicit attention to how risks would be identified, monitored, and managed throughout the implementation process.

### 4.4. Conceptual Framework

The synthesis of the literature review, model comparison, and case study evidence produces the conceptual framework presented in Figure 3. Three interdependent pillars support effective risk governance for digital transformation: visionary leadership, ethical governance, and cultural alignment. These pillars operate through change management instruments (Kotter, Lewin, ADKAR in

 

hybrid combination) to address the identified risk categories while pursuing the desired outcomes of student engagement, digital competence, institutional resilience, and equitable access.

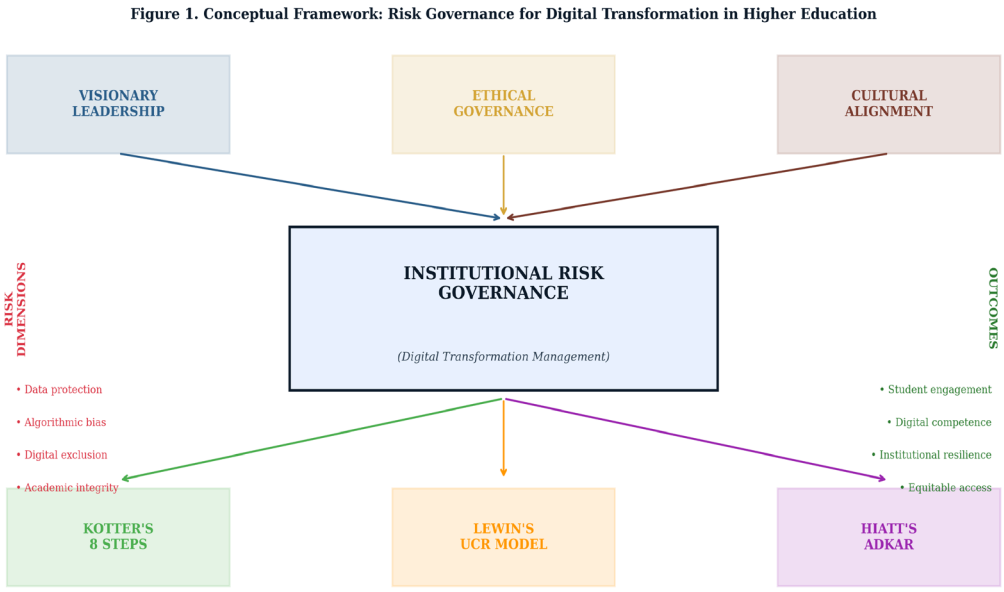


Figure 3. Conceptual framework: risk governance for digital transformation in higher education. Source: Author's own elaboration.

## 5. DISCUSSION

### 5.1. Toward Hybrid Risk Governance

The evidence assembled in this review points toward a clear conclusion: managing digital transformation in universities requires a governance approach that is simultaneously strategic, ethical, and personally attentive. No single change management model satisfies all three requirements. Kotter's sequential structure provides strategic direction but risks imposing a corporate logic that conflicts with academic collegial traditions. Lewin's emphasis on cultural embedding protects institutional identity but may slow adoption below the pace that competitive pressures demand. ADKAR's individual focus addresses the human dimension but cannot substitute for the institutional vision that digital transformation requires. The gap is particularly visible in scenarios where faculty members have developed individual digital competencies and express willingness to adopt new tools, but the institution has not articulated a coherent strategy for integrating these individual efforts into a coordinated transformation programme. ADKAR identifies the readiness but provides no mechanism for generating the strategic direction that would channel it productively.

The practical implication is that university leaders should design hybrid governance frameworks that draw selectively on each model's strengths. In the early stages of digital transformation, Kotter's urgency and coalition-building provide essential momentum. During implementation, ADKAR's attention to individual awareness, knowledge, and ability helps identify

 

and address staff resistance and skill gaps. In the consolidation phase, Lewin's refreezing mechanisms protect new practices from regression. This sequencing is not prescriptive but illustrative: the appropriate combination depends on each institution's starting conditions, governance culture, and available resources.

The finding resonates with broader organizational theory. Burnes (2004) argues that effective change management requires contingency thinking rather than adherence to any single model, because organizational contexts differ too substantially for universal prescriptions to apply. In higher education specifically, Kezar (2018) documents that universities operate as loosely coupled systems where reforms initiated at the leadership level often dissipate before reaching classroom practice, unless supported by the kind of individual engagement that ADKAR addresses and the cultural embedding that Lewin's model prioritizes. Stouten et al. (2018) reinforce this by showing that the most successful organizational change initiatives combine elements from multiple theoretical traditions rather than following any single model rigidly. The implication for risk governance is that hybrid frameworks are not merely convenient; they are structurally necessary given the organizational characteristics of academic institutions.

### 5.2. Risk Governance as Institutional Capability

The risk framework developed in this review suggests that university leaders should treat risk identification as an ongoing institutional function rather than a one-time exercise. The eight risk categories identified in Table 1 are not static; they evolve as technologies develop, as regulatory environments change, and as institutional experience accumulates. Data protection risks, for example, will intensify as AI systems process increasingly granular student data. Algorithmic bias risks may shift as institutions move from vendor-supplied to internally developed AI tools. Academic integrity challenges are likely to accelerate as generative AI capabilities expand.

This dynamic character argues for the institutionalization of risk monitoring, potentially through digital governance committees that combine technical, ethical, and pedagogical expertise. Such committees would function analogously to audit committees in corporate governance: providing independent oversight, periodic risk assessment, and recommendations for management action. The analogy to internal audit is instructive and can be developed with some specificity. Just as internal audit functions assess whether organizational processes achieve their intended objectives efficiently and in compliance with relevant regulations, a digital governance committee would assess whether educational technology deployments achieve their pedagogical objectives while managing the associated institutional risks. Three audit principles translate directly: independence (the committee should include members without direct responsibility for technology procurement or deployment), periodic assessment (risk profiles should be reviewed at regular intervals rather than only in response to incidents), and structured reporting (findings should be communicated to institutional leadership through formal channels that ensure accountability). The ISO 31000 (2018) framework for risk

 

management provides a methodology that could be adapted for this purpose, offering a structured approach to risk identification, analysis, evaluation, and treatment that is flexible enough to accommodate the particularities of higher education governance.

Bichsel (2012) documents how institutional analytics capabilities in US universities evolved from ad hoc reporting to strategic decision support, and a similar trajectory is plausible for digital risk governance. The key enabler is not technical sophistication but institutional commitment to treating digital risks as management-relevant information that informs resource allocation and policy design. Serdyukov (2017) makes a related argument about innovation in higher education, noting that sustainable innovation requires not only creative ideas but also the organizational infrastructure to evaluate, scale, and govern them. Without this infrastructure, digital transformation risks becoming a series of disconnected pilot projects that neither accumulate institutional learning nor deliver lasting improvements.

The case study evidence reinforces this point. The We Grow People project's success was built on distributed governance with clear accountability structures, while HOLOTRAIN's achievements depended on centralized oversight with rigorous KPI monitoring. Despite their different governance architectures, both projects shared a common feature: explicit attention to how risks (technical failure, stakeholder resistance, equity gaps) would be identified and managed. Universities that adopt digital technologies without comparable governance attention are likely to discover risks reactively, at higher cost and with greater institutional disruption.

### 5.3. Strategic Recommendations

Five strategic recommendations emerge from the analysis, synthesized in Figure 4. Each recommendation is connected to the specific risk categories it is designed to address, ensuring that the governance framework responds to identified threats rather than offering generic prescriptions.

**Figure 4. Strategic Recommendations for University Digital Transformation Governance**

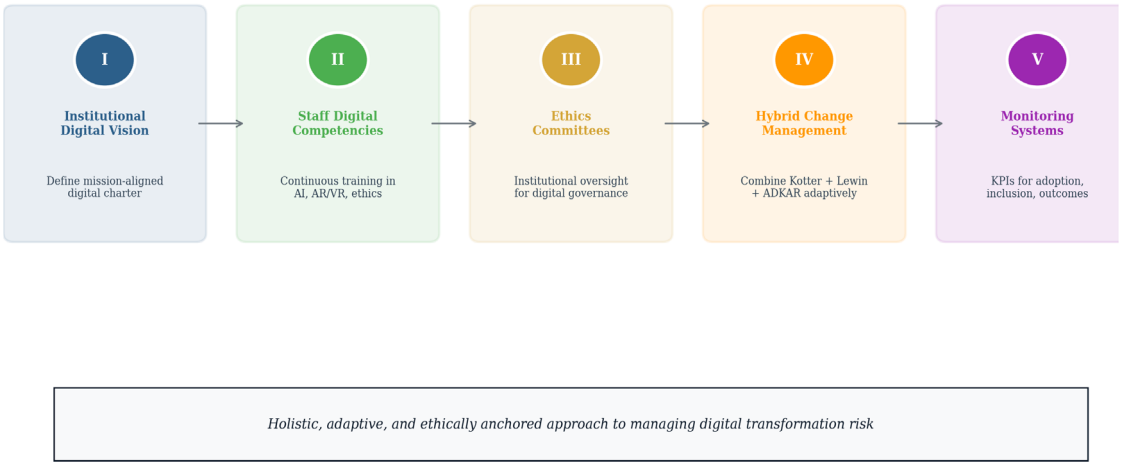


***Figure 4.***. Strategic recommendations for university digital transformation governance.

***Source:*** *Author's own elaboration.*

 

First, universities should develop and communicate a coherent institutional digital vision that aligns technological objectives with academic mission, potentially through formal documents such as a Digital Charter or a University Digital Governance Plan. Such documents serve a dual function: they provide strategic direction for technology investment decisions, and they establish the governance boundaries within which digitalization proceeds. This recommendation addresses primarily the risks of vendor dependency and infrastructure failure, since a clear institutional vision provides criteria for evaluating technology choices and reduces the likelihood of ad hoc procurement decisions that create platform lock-in.

Second, sustained investment in staff digital competencies, covering not only technical skills but also ethical governance and data literacy, is essential for creating the human capital capable of sustaining transformation. Tondeur et al. (2017) demonstrate that teacher beliefs about technology interact with institutional support in determining adoption outcomes, which means that training programmes must address attitudes and pedagogical convictions alongside technical proficiency. Ng et al. (2023) identify specific dimensions of teachers' AI digital competencies that training programmes should target, including data literacy, ethical awareness, and pedagogical integration skills. This recommendation targets the staff skill gaps and cultural resistance risk categories directly.

Third, the creation of dedicated ethics committees or digital observatories provides the institutional oversight necessary for maintaining legitimacy and trust. These structures should include representatives from academic staff, students, IT services, and external stakeholders, ensuring that governance decisions reflect the perspectives of all affected groups. This recommendation addresses the algorithmic bias, data protection, and academic integrity risk categories, providing the institutional mechanism through which ethical principles are translated into operational practice. The committee's mandate should include periodic algorithmic audits of AI-assisted systems, review of data protection compliance in learning analytics, and policy development for generative AI use.

Fourth, change management strategies should be explicitly hybrid, drawing on Kotter for mobilization, Lewin for cultural anchoring, and ADKAR for individual readiness, with the mix adjusted to institutional context. The comparative assessment in Table 2 provides a diagnostic tool for identifying which model's strengths are most needed at each stage of the transformation process.

Fifth, monitoring and evaluation systems with measurable indicators should be established and linked specifically to the eight risk categories identified in this review. For example, monitoring of algorithmic bias risks could track disparities in AI-generated assessment scores across demographic groups; monitoring of digital exclusion could measure technology access and usage gaps across student populations; monitoring of cultural resistance could track adoption rates and satisfaction levels among teaching staff. Bichsel (2012) documents how analytics capabilities in higher education evolve from basic reporting to strategic decision support, and digital transformation monitoring should follow a similar maturation trajectory.

 

### 5.4. Limitations

This review has several limitations that should be acknowledged. The literature search, while conducted across four databases with explicit search terms and selection criteria, is narrative rather than systematic, which means that relevant contributions may have been missed, particularly those published in languages other than English. The two case studies originate in vocational training rather than higher education, which limits direct transferability despite the governance analogies drawn. The author's direct involvement in both projects provides operational insight but also introduces a potential bias toward favourable interpretation. The comparative model assessment in Table 2 involves qualitative judgements that, while grounded in the literature and supported by a stated scoring rationale, are not derived from empirical measurement. The risk matrix in Figure 1 represents estimated rather than measured probabilities and impacts, and should be treated as a heuristic for governance planning rather than a precise risk quantification. Future research should address these gaps through empirical studies that test the proposed framework in university settings, ideally with longitudinal designs that track how risk profiles evolve during digital transformation implementation.

## 6. CONCLUSIONS

Digital transformation in higher education is not merely a technological upgrade; it is a governance challenge that requires institutions to identify, assess, and manage a range of institutional risks while pursuing the pedagogical and strategic benefits that new technologies offer. This review has demonstrated that classical change management models, when adapted and combined into hybrid frameworks, provide useful governance instruments for managing this complexity.

Three key findings deserve emphasis. First, the institutional risks of educational digitalization span eight categories – data protection, algorithmic fairness, digital inclusion, academic integrity, cultural resistance, infrastructure reliability, staff competencies, and vendor dependency – that require governance structures capable of addressing technical, ethical, and organizational dimensions simultaneously. Second, no single change management model is adequate for university digitalization; hybrid approaches that combine Kotter's strategic mobilization, Lewin's cultural anchoring, and ADKAR's individual readiness produce the most resilient governance frameworks. Third, practical experience from vocational training projects confirms that governance model choice shapes transformation outcomes: equity-focused approaches generate inclusive but incremental change, while innovation-focused approaches produce rapid but resource-intensive transformation.

For university leaders, the practical message is that digital transformation governance should be treated as an institutional capability, not a one-time project. This means embedding risk identification into institutional decision-making, investing in the ethical and managerial infrastructure that makes technology adoption sustainable, and establishing monitoring systems that enable continuous learning and adjustment. The analogy to internal audit functions is not merely illustrative;

 

it points to a governance architecture in which digital risk oversight becomes as routine and institutionally embedded as financial oversight. Universities that succeed in combining visionary leadership, cultural continuity, and responsible governance with the opportunities of emerging technologies will strengthen both their academic performance and their institutional resilience.

The present review has deliberately focused on governance frameworks rather than on the technologies themselves, because the evidence consistently shows that implementation outcomes depend more on how change is managed than on what technology is deployed. This finding should not be interpreted as minimizing the importance of technological choice, but rather as foregrounding the institutional conditions that determine whether any given technology delivers its intended benefits. Future research should test the proposed framework empirically, ideally through comparative case studies of universities at different stages of digital transformation and in different national governance contexts, to establish which combinations of change management approaches produce the best outcomes under which conditions.

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### AUTHOR CONTRIBUTIONS

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The author declares no conflict of interest.

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