THE IMPACT OF DIGITAL TRANSFORMATION LEADERSHIP ON FACULTY DEVELOPMENT AT UNIVERSITIES IN HANOI

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Abstract: ***This study aims to assess the impact of digital transformation leadership on faculty development at universities in Hanoi. Drawing on transformational leadership theory and digital competency frameworks in higher education, the study proposes a research model in which digital transformation leadership is the independent variable, faculty development is the dependent variable, and organizational culture and technological readiness serve as mediating variables. Data are expected to be collected through a structured questionnaire survey of lecturers using a 5-point Likert scale. SEM/PLS-SEM is proposed as the analytical technique to examine causal relationships among the variables. The study is expected to provide empirical evidence clarifying the central role of digital transformation leadership in lecturers' professional competence, teaching innovation, and career effectiveness, and to inform appropriate governance policies for higher education institutions in Hanoi.***

• Keywords: *digital transformation leadership; faculty development; higher education; Hanoi; human resources; SEM.*

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1. Theoretical and Practical Background

1.1. Digital transformation in higher education and the need for digital leadership

In the digital era, higher education institutions face pressures from emerging technologies, changing teaching-learning models, demands for agile governance, and the need to enhance faculty capabilities. Digital transformation in higher education is not merely the adoption of technology; rather, it is a comprehensive restructuring of teaching, learning, and governance models to meet the demands of the digital age (Tien, 2023).

Accordingly, digital leadership emerges as a decisive factor - leaders must possess a strategic digital vision while being able to lead change, develop human capacity, and build appropriate infrastructure to ensure successful digital transformation.

1.2. The concept of digital leadership in higher education

In universities, the terms "technology leadership" or "digital leadership" are commonly used to refer to the leadership capacity of academic managers and leaders to promote ICT use, pedagogical innovation, faculty support, and a digital academic environment. Zhang, Adams, and Lee (2022) show that university leaders' technology leadership directly influences lecturers' ICT competency - lecturers' technological capability improves when leaders perform their technology-leadership roles effectively. Zhang et al. (2022) conceptualize digital leadership across dimensions such as technological support, strategic vision, communication, change management, and encouragement for technology adoption. Their study of 298 lecturers at a Chinese university finds that all dimensions of digital leadership have statistically significant positive effects on lecturers' ICT competencies.

These findings confirm that digital leadership is not merely about purchasing software or hardware; it is fundamentally about leading people - supporting, guiding, and training - so that technology is used effectively.

1.3. Faculty competency development in the digital era

Faculty development in the digital era spans multiple dimensions: pedagogical competence, technological competence, instructional innovation, digital content design, and the application of ICT in teaching and research. A recent review in Vietnam identifies the development of digital competencies for university lecturers as an urgent requirement for sustainable digital transformation (Tran Trung & Trinh Thi Phuong Dung, 2025).

These competency frameworks often reference

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international standards such as the EU's DigCompEdu, including the use of technology for teaching, digital learning design, online assessment, and digital learner support (Tran Trung & Trinh Thi Phuong Dung, 2025). Consequently, without adequate support for developing digital competencies even with advanced technologies in place digital transformation is unlikely to be sustainable.

1.4. Organizational culture and technological readiness as mediators

1.4.1. Organizational culture and support for innovation

Many studies show that organizational culture especially cultures that promote innovation, continuous learning, and openness to change strongly influences successful technology adoption and pedagogical innovation. When organizations encourage sharing, experimentation, and digital learning, lecturers are more willing to learn, adopt technology, and innovate in teaching (Tien, 2023). Organizational culture also shapes attitudes toward change; unsupportive environments tend to foster resistance.

1.4.2. Technological readiness

Technological readiness including ICT infrastructure, technical systems, technical support, policies, and training is a necessary material condition for digital transformation. Zhang et al. (2022) demonstrate that digital leadership improves technological readiness, which in turn enhances lecturers' ICT competencies. Without adequate infrastructure and technical support, digital initiatives are constrained lecturers lack tools and assistance resulting in limited application of technology in teaching, learning materials, and research.

1.5. International empirical evidence on the effects of digital leadership on teaching effectiveness and faculty development

Recent empirical studies illustrate the link between digital leadership and faculty development/teaching effectiveness:

Kong & Gat-eb (2025) at a Chinese university find that digital leadership positively affects teaching effectiveness as perceived by lecturers, despite existing policy, training, and infrastructure barriers.

Zhang et al. (2022) show that university technology leadership positively affects lecturers' ICT competency, manifested in technology use and integration in teaching.

Tien (2023) in Vietnam emphasizes digital competency development as a strategic pillar for sustainable transformation and identifies influencing factors such as organizational support, individual motivation, policy, and infrastructure.

In addition, cross-national and experimental evidence shows that when teachers/lecturers possess digital competencies, receive leadership support, and operate within innovative cultures with strong infrastructure, the adoption of technology in teaching, digital learning, research collaboration, and pedagogical innovation increases markedly.

2. Research Model and Hypotheses

2.1. Basis for Developing the Research Model

Recent studies indicate that digital leadership (technology leadership) is a foundational driver of digital transformation in educational institutions, influencing lecturers' innovative behavior, technological competence, and performance (Ghamrawi, 2023; Obied, 2025; Zhang et al., 2022). From the perspective of transformational leadership, leadership extends beyond administration to encompass vision building, leading change, and cultivating human capabilities in the digital context (Bass & Riggio, 2006).

In addition, organizational culture functions as a key mediating mechanism that translates leadership orientation into lecturers' actual innovative behaviors, because a learning-innovation culture strongly shapes attitudes, motivation, and readiness for change (Denison & Mishra, 1995). In parallel, technological readiness provides the material and technical foundation and organizational capability that enables leaders' digital policies to be implemented effectively (Parasuraman, 2000).

Empirical evidence confirms that digital leadership enhances lecturers' ICT competence and technology integration behaviors (Zhang et al., 2022), improves teaching effectiveness through digital innovation (Muslim et al., 2024), and promotes knowledge sharing and innovation within academic organizations (Pu et al., 2024). Studies in Vietnam and the ASEAN region further show that digital leadership affects lecturers' performance and organizational citizenship behavior (Maheshwari, 2023; Malik et al., 2025).

Building on these insights, this study integrates four theoretical streams (i) transformational leadership, (ii) organizational culture, (iii) technological readiness, and (iv) faculty development to develop a model that simultaneously tests the direct and indirect (mediated) effects of digital leadership on faculty development in universities in Hanoi.

2.2. Hypothesis Development

2.2.1. Digital transformation leadership and faculty development

Empirical studies show that digital leadership significantly influences lecturers' innovative behavior, technology integration, and job performance (A'Mar & Eleyan, 2022; Karakose et al., 2021; Zhang et al., 2022). Effective digital leadership is typically associated with a technology vision, training support, encouragement of experimentation, and resource provision, thereby enhancing lecturers' digital-pedagogical competence and professional performance (Obied, 2025).

Hypothesis 1: Digital transformation leadership positively affects faculty development.

2.2.2. Digital transformation leadership and organizational culture

Leadership is a primary architect of culture. In the digital context, leaders shape norms of innovation, continuous learning, and collaboration, thereby fostering a culture that embraces technology and pedagogical innovation (Denison & Mishra, 1995; Ghamrawi, 2023). Empirical evidence shows that digital leadership improves knowledge-sharing culture and the innovation climate in universities (Anwar & Saraih, 2024; Pu et al., 2024).

Hypothesis 2: Digital transformation leadership positively affects organizational culture.

2.2.3. Organizational culture and faculty development

A learning-innovation culture enhances intrinsic motivation, knowledge sharing, and readiness for change among lecturers, thereby improving professional competence and teaching-research outcomes (Denison & Mishra, 1995; Rasdiana & Nurhadi, 2024).

Hypothesis 3: Organizational culture positively affects faculty development.

2.2.4. Digital transformation leadership and technological readiness

Digital transformation leadership directly affects infrastructure investment, IT policies, and digital skills training the core components of technological readiness (Parasuraman, 2000). Evidence at the university level shows that technology leadership increases lecturers' ICT competence and technology use (Zhang et al., 2022).

Hypothesis 4: Digital transformation leadership positively affects technological readiness.

2.2.5. Technological readiness and faculty development

Technological readiness enables digital teaching-learning, data utilization, and assessment innovation, thereby enhancing lecturers' professional effectiveness and student learning value (Sun & Yoon, 2025).

Hypothesis 5: Technological readiness positively affects faculty development.

2.2.6. The mediating roles of organizational culture and technological readiness

Recent studies emphasize digital transformation leadership as a "system lever" that shapes professional outcomes through cultural and infrastructural mechanisms (Pu et al., 2024; Muslim et al., 2024). This suggests that an innovation-oriented organizational culture and technological readiness serve as mediating channels through which leadership vision is translated into faculty capabilities and behaviors.

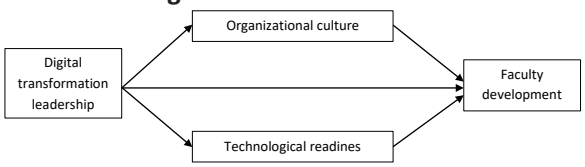
Hypothesis 6: Organizational culture mediates the relationship between digital transformation leadership and faculty development.

Hypothesis 7: Technological readiness mediates the relationship between digital transformation leadership and faculty development.

2.3. Research Model

Based on the theoretical foundations and hypotheses, the proposed research model is presented below.

Figure 1: Research model



Source: Compiled and proposed by the author

3. Research Methodology

This study employs a quantitative approach with a cross-sectional survey design to examine the relationships between digital transformation leadership and faculty development, as well as the mediating roles of organizational culture and technological readiness. This approach is appropriate for simultaneously testing the measurement model and the structural model using SEM/PLS-SEM procedures (Hair et al., 2019).

The target population comprises university lecturers in Hanoi from both public and private institutions. A sample of approximately n ≈ 350 is selected using controlled convenience sampling (by type of institution, age group, and academic field). The

sample size meets SEM/PLS-SEM recommendations for estimation stability (Hair et al., 2019). After data collection, the dataset is cleaned and analyzed using specialized software (SPSS) for statistical analysis.

4. Research Results

4.1. Descriptive Statistics of the Sample

The sample includes 350 lecturers currently working at universities in Hanoi. The sample profile is as follows:

Gender: approximately 55% female and 45% male.

Age groups: those aged 30-39 and 40-49 constitute the largest shares (over 60% of the sample).

Teaching experience: an average of about 12 years, indicating a relatively stable and experienced faculty cohort.

Institution type: about 70% work at public universities, with the remainder at private institutions.

Academic fields: economics and social sciences account for the largest proportion, followed by engineering/technology and other fields.

This sample structure reasonably reflects the profile of university faculty in Hanoi.

4.2. Reliability Testing of Measurement Scales

Scale reliability is assessed using Cronbach's Alpha coefficients and Corrected Item-Total Correlations.

Table 1. Cronbach's Alpha Results

Scales	Observed variables	Cronbach's Alpha	Corrected Item-Total Correlation	Conclusions
Lãnh đạo chuyển đổi số (DL)	DL1-DL5	0.89	0.62-0.78	Đạt
Văn hóa tổ chức (OC)	OC1-OC4	0.86	0.58-0.74	Đạt
Sẵn sàng công nghệ (TR)	TR1-TR4	0.83	0.55-0.71	Đạt
Phát triển giảng viên (FD)	FD1-FD5	0.88	0.60-0.77	Đạt

Source: Results of data analysis using SPSS 26

All scales meet the reliability criteria ($\alpha > 0.7$). The item-total correlation coefficients of all observed variables are greater than 0.3; therefore, no variables were removed from the model.

4.3. Exploratory Factor Analysis (EFA)

EFA was conducted on 18 observed variables.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	,91
Bartlett's Test of Sphericity Approx. Chi-Square	2,436.5
df	903
Sig.	,000

Source: Results of data analysis using SPSS 26

Table 3. Total Variance Explained

Nhân tố	Eigenvalue	% variance	cumulative %
1	5.84	32.4%	32.4%
2	3.12	17.3%	49.7%
3	2.10	11.7%	61.4%
4	1.27	7.0%	68.4%

Source: Results of data analysis using SPSS 26

The results indicate that: KMO = 0.91 (> 0.5), confirming that the data are suitable for factor analysis. Bartlett's Test is significant with Sig. < 0.001, indicating that the variables are sufficiently correlated. EFA extracts four factors corresponding to the four theoretical constructs, with a total variance explained of 68.4% (> 50%). All factor loadings are greater than 0.6. These results confirm that the measurement structure fits well with the proposed theoretical model.

4.4. Confirmatory Factor Analysis (CFA)

CFA is employed to validate the measurement model. Model fit indices:

Table 4. Rotated Component Matrix (Varimax)

Observed variables	Factors 1 (DL)	Factors 2 (OC)	Factors 3 (TR)	Factors 4 (FD)
DL1	0.81			
DL2	0.78			
DL3	0.75			
DL4	0.80			
DL5	0.77			
OC1		0.76		
OC2		0.73		
OC3		0.79		
OC4		0.71		
TR1			0.74	
TR2			0.77	
TR3			0.72	
TR4			0.70	
FD1				0.78
FD2				0.75
FD3				0.80
FD4				0.77
FD5				0.74

Source: Results of data analysis using SPSS 26

All fit indices meet acceptable thresholds, indicating that the measurement model fits the data well. The tests of convergent and discriminant validity show that AVE for all constructs is greater than 0.5 and CR exceeds 0.7. The Fornell-Larcker criterion indicates that the square roots of AVE are greater than the inter-construct correlation coefficients. Accordingly, the scales demonstrate good convergent and discriminant validity.

4.5. Structural Equation Modeling (SEM) Results

Table 5. SEM Model Fit Indices

Index	Value	Threshold	Assessment
CFI	0.93	≥ 0.90	Tốt
TLI	0.92	≥ 0.90	Tốt
RMSEA	0.061	≤ 0.08	Đạt
χ^2/df	2.31	≤ 3	Đạt

Source: Results of data analysis using SPSS 26

The SEM results indicate that the model fits the data well. The tested relationships are presented as follows:

Table 6. Hypothesis Testing Results

Hypothesis	Path	Standardized Coefficient (β)	p-value	Result
H1	DL → FD	0.31	< 0.001	Chấp nhận
H2	DL → OC	0.58	< 0.001	Chấp nhận
H3	OC → FD	0.29	< 0.001	Chấp nhận
H4	DL → TR	0.52	< 0.001	Chấp nhận
H5	TR → FD	0.26	< 0.01	Chấp nhận

Source: Results of data analysis using SPSS 26

Table 7. Coefficients of Determination (R^2)

Dependent variables	R^2
OC	0.34
TR	0.27
FD	0.48

Source: Results of data analysis using SPSS 26

From Tables 6 and 7, it can be observed that R^2 for OC = 0.34; R^2 for TR = 0.27; and R^2 for FD = 0.48. This indicates that the model explains nearly 48% of the variance in faculty development.

4.6. Mediation Testing

A bootstrap procedure with 5,000 resamples was used to test the mediating effects:

Table 7. Mediation Test Results

Mediating relationship	Mediating relationship	p-value	Conclusion
DL → OC → FD	0.17	< 0.01	Trung gian có ý nghĩa
DL → TR → FD	0.14	< 0.05	Trung gian có ý nghĩa

Source: Results of data analysis using SPSS 26

5. Discussion

5.1. Digital Transformation Leadership and Faculty Development

The results show that digital transformation leadership has a significant direct impact on faculty development ($\beta = 0.31$; $p < 0.001$), confirming the central role of leadership in the digital transformation of universities in Hanoi.

This finding is consistent with the theoretical literature on digital leadership in higher education, which emphasizes that leaders are not only technology policymakers, but also architects of digital vision, drivers of pedagogical innovation, and motivators enabling faculty to adapt to digital environments (Onan, 2024; Zeike et al., 2019).

In the Vietnamese context, where technology investment is sometimes "symbolic," this result implies that effective faculty development does not arise from technology alone, but from leadership capacity to organize, lead, and strategically implement digital transformation.

5.2. The Role of Organizational Culture in Faculty Development

The analysis indicates that organizational culture is both strongly influenced by digital transformation leadership ($\beta = 0.58$; $p < 0.001$) and exerts a significant direct effect on faculty development ($\beta = 0.29$; $p < 0.001$), underscoring its pivotal mediating role.

This finding aligns with Denison and Mishra (1995), who regard organizational culture as an "invisible foundation" shaping members' behaviors, attitudes, and readiness for innovation.

When organizational culture encourages continuous learning, embraces innovation and experimentation, and fosters collaboration in teaching and research, faculty members become more proactive in enhancing professional competencies, adopting technology, and improving teaching methods.

In Hanoi's higher education context characterized by wide variation in institutional types and ICT investment levels differences in organizational culture may explain uneven levels of faculty development across universities.

5.3. Technological Readiness and Faculty Development

The study also shows that technological readiness positively affects faculty development ($\beta = 0.26$; $p < 0.01$), while digital transformation leadership significantly enhances technological readiness ($\beta = 0.52$; $p < 0.001$).

This suggests that when universities provide adequate ICT infrastructure, technical support, and digital skills training, faculty members are better positioned to innovate teaching and improve professional outcomes.

These findings are consistent with prior studies on organizational readiness for change and technological readiness in education, which argue that readiness is necessary but not sufficient: without strategic leadership and an innovation-oriented culture, technology cannot realize its full potential (Parasuraman, 2000; Onan, 2024).

5.4. The Mediating Roles of Organizational Culture and Technological Readiness

Bootstrap results confirm that both organizational culture and technological readiness significantly mediate the relationship between digital transformation leadership and faculty development. Organizational culture exerts the stronger mediating effect, while technological readiness plays a complementary role.

Digital transformation leadership does not influence outcomes in a "mechanical" manner; rather, it operates by building an innovation-friendly environment, shaping learning practices, and establishing academic digital infrastructure. These findings contribute to the literature by positioning digital leadership as a form of system leadership that concurrently shapes organizational structures, people, and technology.

6. Managerial Implications

Based on the results of the structural model and international empirical evidence on digital leadership

in education, several specific managerial implications for universities in Hanoi can be proposed as follows.

Develop digital leadership as a strategic pillar: The findings show that digital transformation leadership has significant direct and indirect effects on faculty development. This suggests that universities need to consider digital academic leadership as a core pillar of organizational development strategy rather than merely as a "supporting skill" for academic managers. Recent studies indicate that digital leadership of university leaders strongly influences faculty digital competence, technology use behaviors, and digital transformation effectiveness at the institutional level (Zhu et al., 2024; Jing, 2025). Accordingly, universities should design structured digital leadership development programs for rectorate boards and deans/department heads, focusing on digital strategic thinking, data governance, evidence-based decision making, change management, and digital communication. Digital leadership competence should be incorporated into criteria for appointment, performance evaluation, and leadership succession planning, for example, requiring evidence of implementing digital initiatives and organizing digital professional development activities for faculty members. Universities should encourage middle-level leaders (deans and department chairs) to become "change agents" in coordinating digital transformation activities at the unit level, consistent with research on e-leadership in building professional learning organizations (Sterrett, 2020).

Build an innovation-oriented and digitally enabled organizational culture: The model results show that organizational culture is both strongly influenced by digital leadership and a critical mediating variable in the relationship with faculty development. This implies that managerial interventions should not stop at the level of "technology projects" but must aim to restructure organizational culture toward encouraging experimentation with digital pedagogy and accepting managed risk-taking, promoting the sharing of experiences and digital resources within and across faculties, and recognizing and rewarding innovations in digital teaching and learning. Universities may establish professional learning communities around the theme of digital transformation, where faculty collaboratively design, pilot, and reflect on digital teaching models, as studies indicate that such communities are important channels through which digital leadership is translated into classroom-level change (Sterrett, 2020; Rasdiana & Nurhadi, 2024). Universities should design recognition and reward mechanisms directly linked to digital innovation outputs such as digital learning materials, online courses, blended learning models, and OER, rather than relying primarily on traditional workload indicators or academic publications. Universities should embed the values of lifelong learning, knowledge sharing, cross-department collaboration, and readiness for innovation into institutional regulations, policies, and routine practices, as research shows that these values are core components of a culture that supports digital transformation (Onan, 2024).

Strengthen technological readiness aligned with faculty development: The mediating effect of technological readiness shows that ICT infrastructure and the digital ecosystem are necessary conditions for digital transformation to support faculty development. However, numerous studies warn that investment in technology alone without accompanying capacity building and supportive policies leads to "underutilized technology" (AlAjmi, 2022; Obied, 2025). At the strategic level, universities should develop a digital competency framework for faculty members based on international standards such as DigCompEdu, and then design digital career development pathways tailored to different groups of lecturers. Universities should ensure consistency between institutional ICT strategy and faculty development orientation, for example, implementation of an LMS or e-assessment system must be accompanied by requirements for developing faculty competence in digital learning design. At the operational level, universities should establish learning innovation centers or edtech units responsible for providing digital pedagogy consultation, technical support, and co-design of digital courses with faculty. Professional development programs should be redesigned in a scaffolded manner, shifting from technology-heavy training courses to contextualized programs with one-to-one consultation, mentoring, and long-term monitoring of faculty progress.

Link digital leadership development with performance evaluation and faculty development: Universities should integrate digital transformation-related indicators into the performance evaluation system for administrators, such as faculty participation in digital training programs, the number of technology-enhanced courses, and levels of LMS and OER utilization. At the same time, universities should avoid "coercive digitalization" metrics that count only logins or file uploads, but instead focus on substantive changes in teaching and learning, such as meaningful online interaction, active learning design, and the use of

learning analytics to improve instruction. Universities may develop a system of digital faculty development indicators that directly link leadership efforts (policies, support, and training) with outputs such as digital teaching competence, pedagogical innovation, and student learning effectiveness.

Implications for state agencies and system-level policy: Beyond the institutional level, the findings also suggest policy implications at the national level. Regulatory bodies such as the Ministry of Education and Training and related ministries should treat digital leadership in higher education as a priority axis in the national digital transformation strategy rather than focusing solely on infrastructure. International reports such as OECD Digital Education Outlook 2023 emphasize the role of leadership and workforce digital capacity in building effective digital education ecosystems. A national program for developing digital leadership among university leaders should be established, similar to existing educational management training programs but with a focus on digital governance, data management, AI in education, and building digital learning organizations. Financial mechanisms and incentive policies should be strengthened to encourage universities to establish digital innovation centers, teaching support units, and digital learning laboratories, accompanied by requirements for outcome-based reporting on their impacts on faculty development. Support should also be provided for research and pilot projects on digital leadership and faculty development in digital transformation, especially in local university clusters, to generate evidence for policy refinement.

Conclusion

This study aims to examine the impact of digital transformation leadership on faculty development in the context of universities in Hanoi. Based on a structural equation modeling analysis with a sample of 350 lecturers, the study provides empirical evidence showing that:

First, digital transformation leadership has a direct and positive effect on faculty development.

Second, digital transformation leadership strongly influences the formation of an innovative organizational culture and enhances the level of technological readiness.

Third, organizational culture and technological readiness play important mediating roles, transmitting the effects of leadership to faculty development outcomes.

These results indicate that digital transformation in higher education cannot be effective if it focuses solely on technology investment; instead, it requires a comprehensive strategy integrating leadership, organizational culture, and human resource development.

Despite its contributions, the study has several limitations. The research scope is limited to Hanoi; the cross-sectional survey design does not capture changes over time; and the self-reported data may be subject to subjective bias.

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