EDUCATION LEADERSHIP STRATEGIES FOR ENHANCING EDUCATION QUALITY IN HIGHER EDUCATION INSTITUTIONS IN PINGDINGSHAN CITY, CHINA*

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Abstract

This study aims to: 1) examine the impact of educational leadership on quality education through digital technology innovation; 2) develop leadership strategies that enhance teaching quality via digital innovation and technology integration; and 3) evaluate their effectiveness in improving teaching and learning engagement in Pingdingshan's higher education institutions. A quantitative survey of 400 faculty and students was analyzed using Structural Equation Modeling (SEM). Results show that: 1) leadership positively affects digital innovation (β = 0.58, p < .001) and technology integration (β = 0.32, p < .001); 2) these mediators significantly enhance teaching effectiveness and student engagement, explaining 48.6% and 42.7% of variance; and 3) leadership influences outcomes primarily through these mediating factors, confirming partial mediation and highlighting the importance of leadership-driven digital transformation in higher education.

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Introduction

The rapid growth of digital technologies has reshaped higher education, making learning more flexible and interactive. However, technology adoption alone does not ensure improved teaching or engagement; success depends on innovative pedagogy, effective integration, and strong leadership support. Educational leadership is crucial for setting vision, allocating resources, and fostering a culture of innovation. It aligns digital initiatives with instructional goals while minimizing resistance to change.

Digital innovation and technology integration are key processes linking leadership to educational quality. Digital innovation introduces technology-enabled teaching models, whereas technology integration emphasizes the purposeful use of digital tools in instruction. Although these processes are vital, empirical evidence on their mediating roles in higher education, particularly in China, is limited. Teaching effectiveness and student engagement are central indicators of educational quality. Understanding how leadership enhances these outcomes through innovation and integration is essential for institutional improvement.

Using data from 400 university instructors in Pingdingshan, China, this study employs structural equation modeling (SEM) to examine the mediating effects of digital innovation and technology integration, providing insights into how leadership indirectly promotes teaching quality and student engagement in digital learning environments.

Objectives

1. To examine the current challenges and issues related to the impact of educational leadership on quality education through digital technology innovation support in higher education.

2. To develop educational leadership strategies aimed at enhancing teaching quality through effective support for digital technology innovation.

3. To evaluate the effectiveness of educational leadership strategies in improving teaching effectiveness and student learning engagement in higher education institutions in China.

Literature Review

Concepts and Theories Regarding Digital Transformation in Higher Education:Digital transformation reshapes higher education by integrating AI and online learning systems to enhance flexibility and interactivity (Bond, Bedenlier, Marín, & Händel, 2020). Yet, technology alone cannot ensure quality; its success depends on leadership and pedagogical alignment (Rasool, Samma, Wang, Zhao, & Zhang, 2022). In China, Education Informatization 2.0 accelerated adoption, but disparities persist. Effective transformation requires visionary leadership that links digital tools with instructional improvement (Wang, Liu, & Han, 2024).

Concepts and Theories Regarding Educational Leadership:Educational leadership in the digital era emphasizes vision, empowerment, and innovation (Bush, 2020). Transformational and distributed leadership models encourage collaboration and professional growth (Leithwood, Harris, & Hopkins, 2020; Zhang, Ordóñez de Pablos, & Xu, 2021). Leadership’s influence is largely indirect, operating through organizational culture and innovation capacity (Hallinger, 2021). Ethical and inclusive leadership ensures equitable access and sustainable digital transformation (Niță & Guțu, 2023).

Concepts and Theories Regarding Digital Innovation and Technology Integration:Digital innovation introduces new pedagogical practices such as blended and AI-supported learning (Bond et al., 2020). Technology integration emphasizes the meaningful use of digital tools to enhance instruction and assessment (Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2017; Teng & Wang, 2021). Together, innovation and integration form the mechanisms through which leadership improves educational quality (Hallinger, 2021).

Methodology

This study employed a quantitative survey design to examine relationships among educational leadership, digital innovation, technology integration, teaching effectiveness, and student engagement. Data were collected from 400 respondents (faculty and students) from three universities in Pingdingshan, China. A validated questionnaire using a five-point Likert scale showed high reliability (α = 0.93–0.95). Data were gathered between March and May 2024 under ethical approval. Using SPSS 26.0 and AMOS 26.0, Structural Equation Modeling (SEM) confirmed good model fit (CFI = 0.959, RMSEA = 0.046). Leadership significantly influenced digital innovation (β = 0.58) and technology integration (β = 0.32), which mediated effects on teaching effectiveness and student engagement.

Results

Table 1 presents the descriptive statistics and reliability results of the five constructs: educational leadership, digital innovation, technology integration, teaching effectiveness, and student engagement. All constructs exhibited acceptable internal consistency, with Cronbach's alpha coefficients ranging from 0.938 to 0.951 and AVE values exceeding 0.75. Respondents reported

moderate to high levels across all variables, indicating a generally positive perception of leadership, innovation, and learning engagement.

Table 1 Descriptive statistics and reliability of constructs (n = 400)

Construct	Mean	SD	Cronbach's α	CR	AVE
Educational Leadershi	3.80	0.66	0.951	0.95	0.78
Digital Innovation	3.54	0.59	0.938	0.95	0.77
Technology Integration	3.70	0.65	0.946	0.94	0.75
Teaching Effectiveness	3.88	0.66	0.945	0.96	0.80
Student Engagement	3.82	0.64	0.950	0.95	0.78

Correlation analysis showed positive and significant relationships among all constructs ($p < .001$). Multiple regression results revealed that educational leadership, digital innovation, and technology integration jointly explained 48.6% of the variance in teaching effectiveness and 42.7% in student engagement.

The structural equation modeling (SEM) demonstrated a satisfactory fit (CFI = 0.959, TLI = 0.954, RMSEA = 0.046, SRMR = 0.045). As shown in Table 2, educational leadership had significant effects on digital innovation (β = 0.58, $p < .001$) and technology integration (β = 0.32, $p < .001$). Both mediators significantly influenced teaching effectiveness and student engagement, confirming partial mediation effects. These results highlight that leadership contributes to educational outcomes primarily through fostering innovation and supporting the integration of digital technologies in teaching and learning.

Table2 Standardized SEM path coefficients

Path	β	p
Leadership ⟶ Digital Innovation	0.58	< .001
Digital Innovation ⟶ Technological Integration	0.66	< .001
Leadership ⟶ Teaching Effectiveness	0.28	< .001
Leadership ⟶ Student Engagement	0.22	< .001
Digital Innovation ⟶ Teaching Effectiveness	0.13	.012
Digital Innovation ⟶ Student Engagement	0.12	.021
Technological Integration ⟶ Teaching Effectiveness	0.24	< .001
Technological Integration ⟶ Student Engagement	0.31	< .001

Educational leadership significantly enhances digital innovation and technology integration, which subsequently improve teaching effectiveness and student engagement. The indirect effects indicate that leadership impacts educational quality through digital transformation processes, confirming its mediating mechanisms and strategic importance in higher education.

Discussion

The results of research objective 1 showed that educational leadership positively influences digital innovation and technology integration because effective leaders provide vision, resources, and a culture of experimentation. This supports transformational and distributed leadership theories emphasizing empowerment and innovation (Bush, 2020; Leithwood et al., 2020; Zhang et al., 2021).Research objective 2 found that digital innovation and technology integration enhance teaching effectiveness and student engagement by improving interaction, feedback, and flexibility. This aligns with constructivist learning theory and prior findings on technology-enabled active learning (Bond et al., 2020; Teng & Wang, 2021).Research objective 3 confirmed partial mediation, indicating that leadership affects outcomes indirectly through

innovation and integration. This supports Hallinger's (2021) mediation model, emphasizing leadership-driven organizational capacity as the foundation of digital transformation.

Recommendations

Higher education leaders should articulate a clear digital strategy, ensure adequate infrastructure, and incentivize faculty innovation. Faculty members are encouraged to integrate technology purposefully into instruction and engage in professional training. Institutions and policymakers should promote equitable access, reward effective digital teaching, and embed innovation criteria into evaluation systems. These measures strengthen the indirect impact of leadership on teaching quality and student engagement through digital innovation and integration.

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