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Digital Leadership and Organizational Climate in Higher Vocational Colleges: Mediating Effects of Organizational Support on Teachers' Work Performance in Pingdingshan City under Henan Province

Wang Le[1*], Peerapong Tipanark[2], Pornthep Muangman[3]

[1] *Faculty of Education, Bangkokthonburi University, Thailand*
[2] *Faculty of Education, Bangkokthonburi University, Thailand*
[3] *Faculty of Education, Bangkokthonburi University, Thailand*
* *Corresponding author. E-mail: dr.thiwat@gmail.com*

Abstract

The objectives of this research were: (1) To propose the model of digital leadership and organizational climate effects on teachers' work performance that the organizational support as a mediating role of higher vocational colleges in Pingdingshan city; (2) To investigate the direct and indirect effects of digital leadership and organizational climate on teachers' work performance of higher vocational colleges in Pingdingshan city. The research population comprised 2,239 teachers from three higher vocational colleges in Pingdingshan City, Henan Province. A sample of 392 teachers was selected using a proportional stratified random sampling method. Data were collected using a five-point rating scale questionnaire, and data analysis was conducted using Confirmatory Factor Analysis and Structural Equation Modeling. Research results revealed that:(1) The proposed model demonstrated a fit with the empirical data, as evidenced by fit indices such as Chi-square=223.749, GFI=0.941, AGFI=0.913, CFI=0.949, TLI=0.935, RMR=0.015, and RMSEA=0.066, all meeting the standard criteria at a high level; (2) Digital leadership and organizational climate had direct effects on teachers' work performance. Moreover, organizational support acted as a mediator, transmitting the effects of digital leadership and organizational climate on teachers' work performance in higher vocational colleges in Pingdingshan City.

Keywords: Digital Leadership, Organizational Climate, Organizational Support, Teachers' Work Performance, Mediating Effect

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Introduction

In the contemporary educational landscape, digital transformation is significantly reshaping how educational institutions operate, particularly in higher vocational colleges (Al-Harbi & Al-Sarheed, 2022). Digital leadership, defined as the strategic use of digital tools to enhance educational practices and foster an engaging learning environment, is becoming increasingly crucial (Chung, 2021). Simultaneously, the organizational climate, encompassing the collective perceptions of the work environment, plays a pivotal role in shaping teachers' attitudes, behaviors, and performance (Cortellazzo, Bruni, & Zampieri, 2019).

Higher vocational colleges, which focus on providing students with practical skills and knowledge for specific trades, face unique challenges in integrating digital technologies while maintaining a supportive organizational climate (Eisenberger, Huntington, Hutchison, & Sowa, 1986; Zhang & Zheng, 2023). In Pingdingshan City, Henan Province, understanding how digital leadership and organizational climate influence teachers' work performance is particularly pressing (Shen, 2023). This study aims to explore these dynamics and examine the mediating role of organizational support (JianFeng & Worapongpat, 2024).Understanding the interactions between digital leadership, organizational climate, and organizational support is essential for enhancing the overall effectiveness of vocational education (Liu, 2022). This study seeks to address the gap in the literature regarding the combined effects of these factors on teachers' work performance in vocational colleges (Mo, 2021).

Therefore, this research aims to fill the gap in the literature by exploring the complex relationships between digital leadership, organizational climate, and organizational support in higher vocational colleges. By doing so, it provides valuable insights that can inform the development of strategies to enhance teacher performance and overall educational outcomes in vocational education settings. The findings of this research will contribute to the broader understanding of how digital transformation and supportive work environments can drive educational excellence.

Questions

1.How does digital leadership and organizational climate influence teachers' work performance in higher vocational colleges in Pingdingshan city?

2. How do digital leadership and organizational climate collectively impact teachers' work performance through organizational support?

Objectives

1. To propose the model of digital leadership and organizational climate effects on teachers' work performance, with organizational support as a mediating role of higher vocational colleges in Pingdingshan city.

2. To investigate the direct and indirect effects of digital leadership and organizational climate on teachers' work performance in higher vocational colleges in Pingdingshan city.

Hypothesis

H1: Digital Leadership had a direct effect on Organizational Support.
H2: Organizational Climate had a direct effect on Organizational Support.
H3: Digital Leadership had a direct effect on Teachers' Work Performance.
H4: Organizational Climate had a direct effect on Teachers' Work Performance.
H5: Organizational Support had a direct effect on Teachers' Work Performance.

H6: Digital Leadership had an indirect effect on Teachers' Work Performance through Organizational support.

H7: Organizational climate had an indirect effect on Teachers' Work Performance through organizational support.

Literature Reviews

This section reviews relevant literature to clarify the key concepts, theoretical underpinnings, and research gaps that inform this study. It focuses on four core constructs: digital leadership, organizational climate, organizational support, and teachers' work performance. It also synthesizes findings on the interrelationships among these variables to justify the proposed research model.

Core Concepts and Dimensions

Digital leadership refers to the ability of school administrators to strategically guide digital transformation through the integration of digital tools, data-driven decision-making, and an innovation-oriented culture. Rizal, Adam, and Arifin (2021) propose a four-dimensional framework comprising digital thinking change ability, digital resource construction ability, digital ethical empathy, and digital cognitive practice. These dimensions emphasize not only technical competence but also ethical considerations and pedagogical integration. Similarly, Tadesse and Gillies (2017) highlight that digital leadership extends beyond technology use, shaping school vision, culture, and teacher engagement.

Organizational climate is generally defined as employees' shared perceptions of policies, practices, and procedures within their work environment. In vocational college settings, this climate is reflected in leadership patterns, teacher behaviors, management systems, and the alignment of academic environments with industry demands (Makjod, Worapongpat, Kangpheng, & Bhasabutr, 2025). A supportive climate fosters collaboration, innovation, and job satisfaction, ultimately enhancing performance.

Organizational support reflects the extent to which teachers feel valued and assisted by their institution. According to Wenhan (2021), perceived organizational support encompasses job resources, emotional recognition, and concern for employee well-being. Supportive institutions provide teachers not only with materials and professional opportunities but also with psychological safety and professional respect.

Teachers' work performance refers to the professional output and contributions of teachers across multiple domains. In the vocational education context, it primarily includes teaching performance, research productivity, and community service (Worapongpat, 2025a). Given the applied nature of vocational training, particular emphasis is placed on practical teaching effectiveness and collaboration with industry, reflecting the institutions' mission to align education with labor market needs

Interrelationships Among Variables

Existing research suggests a complex interplay among digital leadership, organizational climate, organizational support, and teachers' work performance. As digital transformation accelerates across educational systems, digital leadership has become a critical factor in promoting pedagogical innovation and the effective integration of technology in schools (Worapongpat, 2025b). Research increasingly shows that digital leadership not only directly influences teachers' instructional practices but also indirectly affects their performance by shaping the organizational climate and enhancing organizational support (Worapongpat, 2025c, 2025d). Teachers' work performance, often measured by teaching effectiveness, professional development, and organizational commitment, is widely recognized as a key determinant of educational quality (Worapongpat, 2025e).

Rather than operating in isolation, digital leadership functions within complex organizational systems. It helps create a collaborative climate that boosts teacher engagement,

innovation, and outcomes (Worapongpat, 2025f). In this context, organizational support both emotional and instrumental emerges as a critical mediator. When teachers perceive strong support, such as training, resources, and recognition, they are more willing to innovate and participate in professional learning, ultimately improving performance (Worapongpat, 2025g). Despite these findings, most studies examine these variables in isolation, lacking an integrated perspective. This study addresses this gap by proposing a model that explores the dynamic interactions among digital leadership, organizational climate, and organizational support in shaping teachers' work performance.

Research Gap and Significance

While prior studies have separately examined the impacts of digital leadership, organizational climate, and organizational support on teacher outcomes, research investigating their combined effects especially within the vocational education context in second-tier cities in China remains limited. In particular, the mediating role of organizational support is underexplored in this setting (Worapongpat & Arunyakanon, 2025). This study addresses this gap by constructing and empirically testing a comprehensive structural model connecting digital leadership, organizational climate, and teachers' work performance, with organizational support as a mediator. The findings are expected to contribute not only to academic theory but also to practical strategies for educational reform and performance enhancement in Chinese vocational colleges.

Methodology

Research Design Summary

Component	Detail
Study Population	2,239 teachers from three public higher vocational colleges in Pingdingshan City, Henan Province.
Colleges	1. Pingdingshan Industrial Vocational and Technical College (904 teachers). 2. Henan Quality Engineering Vocational College (799 teachers). 3. Pingdingshan Vocational and Technical College (536 teachers).
Sample Size	392 teachers.
Sampling Method	Stratified Proportional Random Sampling. This method ensured the sample accurately reflected the proportion of teachers in each of the three colleges.
Power Analysis	Sample size was determined using G-Power software based on the following parameters for a $\chi 2$ test: Df=71, α (Error probability) =0.05, effect size w=0.3 (medium), and statistical power =0.8.
Instrument Validation	Index of Item-Objective Congruence (IOC) was used for content validation of the questionnaire.
Data Analysis	Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) were used for inferential analysis to test the direct and indirect (mediating) effects.

Interpretation of Methodology

1. Robust Sampling: The use of Stratified Proportional Random Sampling is a strength, ensuring that the findings are generalizable to the entire population of teachers across the three specific colleges by maintaining the correct proportional representation.

2. Adequate Power: Determining the sample size with G-Power (setting power at 0.8 and the significance level α=0.05) indicates the researchers were systematic in ensuring the study had sufficient statistical power to detect the hypothesized effects.

3. Appropriate Analysis: The combination of CFA (to confirm the measurement model) and SEM (to test the structural model, including mediating effects) is the standard and appropriate approach for testing the complex conceptual framework presented in the study.

Results

1. To propose the model of digital leadership and organizational climate effects on teachers' work performance, with organizational support as a mediating role of higher vocational colleges in Pingdingshan city.

Confirmatory factor analysis established a four-construct measurement model with 14 dimensions and 42 indicators：

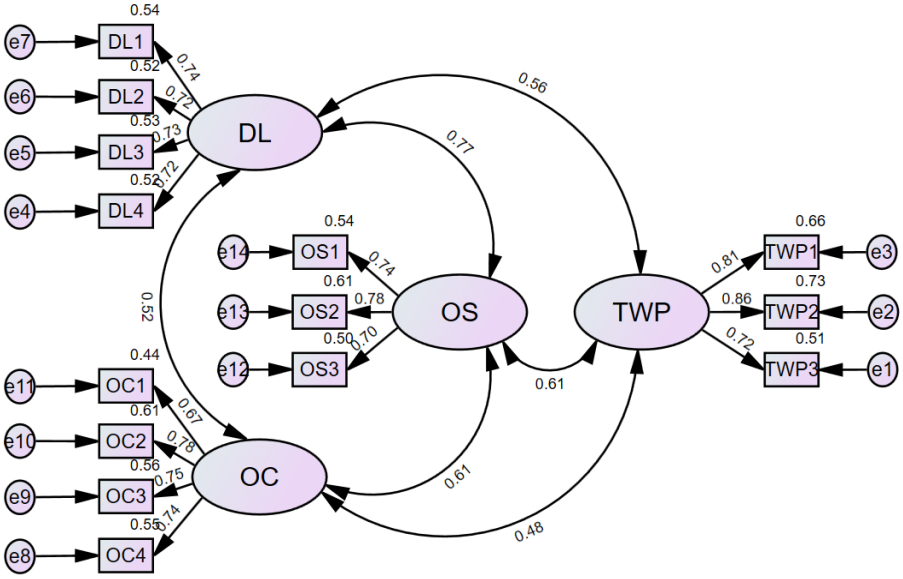
Digital leadership (DL): Digital Thinking Change Ability (DL1), Digital Resource Construction Ability (DL2), Digital Ethical Empathy Ability (DL3), Digital Cognitive Practice Ability. (DL4).

Organizational Climate (OC): Leadership Patterns (OC1), Teachers' Behavior (OC2), Management Systems (OC3), Academic Climate (OC4) .

Organizational Support (OS): Job Support (OS1), Value Recognition (OS2), Concern for Benefits (OS3).

Teachers' Work Performance (TWP): Teaching Performance (TWP1), Research Performance (TWP2), and Community Service Performance (TWP3).

The fit index results from the confirmatory factor analysis model diagram indicate that the X^2/df test value of 3.108 is acceptable, between 3 and 5. The GFI index result stands at 0.941, while the AGFI index reaches 0.913. The CFI index shows 0.949,
The TLI index shows 0.935, RMR index 0.015, and RMSEA index 0.066—all of which are below the 0.08 standard level. All test results in the table fully demonstrate that the confirmatory factor analysis model established in this study meets the standards, passes the fit test, and exhibits excellent goodness-of-fit. Details are shown in Figure 2 and Table 1.



Chi-square =223.749, df =71, p =.000, GFI =.941, AGFI =.913, CFI =.949, TLI =.935
RMR =.015, RMSEA =.066

Figure 1 The CFA Model in Standardized estimates

Table 1 CFA Model fitting index

Measure Value	Threshold	Estimate	Interpretation
$\chi 2$	p > 0.05	-	-
$\chi 2$/df	1-3 Excellent,3-5 Acceptable	3.108	Acceptable
GFI	0.90<GFI≤ 1.00	0.941	Excellent
AGFI	0.90≤AGFI≤ 1.00	0.913	Excellent
CFI	0.95≤CFI≤1.00	0.949	Excellent
TLI	0,90≤TLI≤1.00	0.935	Excellent
RMR	0.00≤RMR≤0.08	0.015	Excellent
RMSEA	0.00≤RMSEA≤0.08	0.066	Excellent

Table 2 The important statistics of CFA model

Factor	Variable	Factor loading		SE	Z-test	p	R^2
		Unstandardized	Standardized				
Teachers' work performance	TWP1	.863	.833	.047	18.511	.00**	.657
	TWP2	1.000	.864	-	-	.00**	.734
	TWP3	.835	.693	.051	16.395	.00**	.512
	CR= 0.841, AVE= 0.640						
Digital leadership	DL1	1.000	.736	-	-	.00**	.541
	DL2	.928	.725	.063	14.626	.00**	.525
	DL3	.922	.728	.063	14.686	.00**	.530
	DL4	.909	.724	.062	14.610	.00**	.524
	CR=0.819, AVE=0.530						
Organizational climate	OC1	.796	.665	.057	13.941	.00**	.443
	OC2	1.000	.779	-	-	.00**	.607
	OC3	.926	.749	.059	15.668	.00**	.561
	OC4	.894	.744	.057	15.569	.00**	.553
	CR=0.825, AVE=0.541						
Organizational support	OS1	.891	.737	.058	15.395	.00**	.543
	OS2	1.000	.783	-	-	.00**	.614
	OS3	.823	.705	.056	14.753	.00**	.497
	CR= 0.786, AVE= 0.551						

Note: ** represents P < 0.01

From Table 2 indicates that the factor loadings of all observed variables range between 0.665 and 0.864 (standardized estimates), and all are statistically significant at p<0.001.These results confirm that the convergent validity of the measurement model is acceptable.

In terms of Composite Reliability (CR), all constructs exceed the recommended threshold of 0.70, with values ranging from 0.786 to 0.841. This indicates that each construct has a high level of internal consistency.

The Average Variance Extracted (AVE) values for all constructs are greater than 0.50, indicating that the majority of variance is captured by the latent variables rather than measurement error. These CR and AVE results support the conclusion that the model has good construct validity. Furthermore, the AVE values exceed 0.50 and the square root of each AVE is higher than the inter-construct correlations, which also indicates adequate discriminant validity.

Table 3 The correlation matrix of 14 observed variables in the measurement model
** Correlation is significant at the p-value < 0.01 level (2-tailed).

	DL1	DL2	DL3	DL4	OC1	OC2	OC3	OC4	OS1	OS2	OS3	TWP1	TWP2	TWP3
DL1	1													
DL2	.526**	1												
DL3	.540**	.501**	1											
DL4	.529**	.552**	.532**	1										
OC1	.268**	.313**	.289**	.176**	1									
OC2	.236**	.275**	.257**	.221**	.548**	1								
OC3	.349**	.375**	.320**	.295**	.462**	.573**	1							
OC4	.281**	.298**	.328**	.250**	.496**	.596**	.550**	1						
OC1	.455**	.436**	.456**	.396**	.385**	.285**	.314**	.266**	1					
OC2	.435**	.390**	.405**	.420**	.294**	.422**	.396**	.320*	.577***	1				
OC3	.417**	.374**	.414**	.391**	.243**	.277**	.457**	.304**	.518**	.554**	1			
TWP1	.321**	.372**	.384**	.343**	.243**	.283**	.318**	.268**	.338**	.417**	.321**	1		
TWP2	.335**	.380**	.351**	.293**	.234**	.240**	.446**	.278**	.366**	.464**	.359**	.692**	1	
TWP3	.279**	.316**	.322**	.229**	.250**	.220**	.328**	.341**	.290**	.339**	.249**	.580**	.615**	1

Note: ** represents P < 0.01

Table 3 presents the correlation matrix of the observed variables. It shows that, overall independent observed variables were statistically significantly positively correlated at the 0.01 level (p-value < 0.01). The correlation coefficient ranged from 0.176 to 0.692. This indicates that the correlation coefficients are statistically significant, fully demonstrating that there are significant correlations between each pair of the 14 latent variables in this study.

2. To investigate the direct and indirect effects of digital leadership and organizational climate on teachers' work performance in higher vocational colleges in Pingdingshan city.

This study aimed to investigate the direct and indirect relationships between digital leadership, organizational climate, and teachers' work performance, with organizational support acting as a mediating factor. To analyze these relationships, the Structural Equation Modeling (SEM) method was employed in AMOS.

The research results for this part are presented in Figures 3 and Table 2 below.

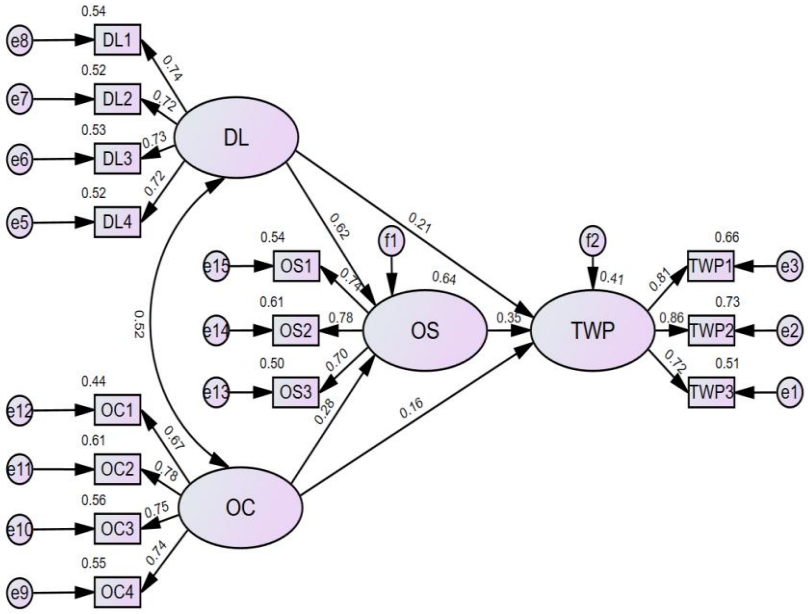


Figure 2 The SEM model in Standardized estimates

Table 4 Final Model Modification Indices Reflecting the Consistency of Variables with the Empirical Data

Measure Value	Threshold	Estimate	Interpretation
$\chi 2$	$p > 0.05$	-	-
$\chi 2/df$	1-3 Excellent,3-5 Acceptable	3.108	Acceptable
GFI	$0.90<GFI\leq 1.00$	0.941	Excellent
AGFI	$0.90\leq AGFI\leq 1.00$	0.913	Excellent
CFI	$0.95\leq CFI\leq 1.00$	0.949	Excellent
TLI	$0,90\leq TLI\leq 1.00$	0.935	Excellent
RMR	$0.00\leq RMR\leq 0.08$	0.015	Excellent
RMSEA	$0.00\leq RMSEA\leq 0.08$	0.066	Excellent

As shown in Table 4, the structural equation model (SEM) examining the relationships among digital leadership, organizational climate, and teachers' work performance—with organizational support as a mediating variable—in higher vocational colleges in Pingdingshan City demonstrated a good fit with the empirical data. The model showed strong statistical significance at the 0.001 level. The fit indices were as follows: $\chi^2(72) = 223.749$, $p < 0.001$; Goodness of Fit Index (GFI) = 0.941; Adjusted Goodness of Fit Index (AGFI) = 0.913; Tucker–Lewis Index (TLI) = 0.935; Comparative Fit Index (CFI) = 0.949; Root Mean Square Residual (RMR) = 0.015; and Root Mean Square Error of Approximation (RMSEA) = 0.066. All indices met the recommended thresholds, indicating that the model fits the collected questionnaire data well.

The results of hypothesis testing are presented to examine both the direct and indirect effects of Digital Leadership (DL) and Organizational Climate (OC) on Teachers' Work Performance (TWP), with Organizational Support (OS) acting as a mediating variable in higher vocational colleges in Pingdingshan City. These findings are illustrated in Figure 4 and summarized in Table 5.

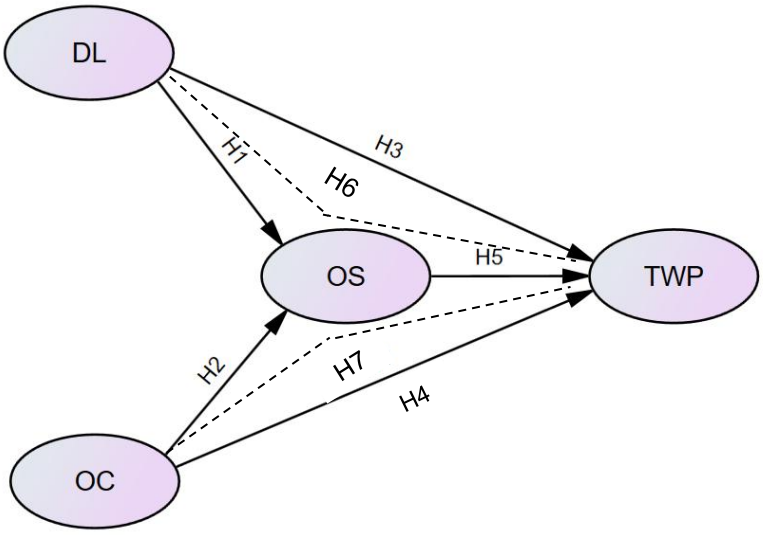


Figure 3 A path diagram of hypotheses testing

Table 5 Hypothesis testing of Structural Equation Model

Hypotheses	Path of delivery	Unstandardized Estimate	Standardized Estimate	Z-test	p
Direct effect					
H1	DL=> OS	0.742	0.619	9.815	.00**
H2	OC=> OS	0.219	0.281	5.114	.00**
H3	DL=>TWP	0.268	0.215	2.422	.00**
H4	OC=>TWP	0.132	0.163	2.601	.00**
H5	OS=>TWP	0.359	0.345	3.456	.00**
Indirect effect					
H6	DL=> OS => TWP	0.230	0.214	3.330	.00**
H7	OC=> OS => TWP	0.030	0.097	2.890	.00**

Significance of Estimates: **p<0.01

Table 5 indicates that:

1.H1: Digital Leadership had a significant positive effect on Organizational support(λ=0.619,Z=9.815,p<0.001). Therefore, H1 is accepted.

2.H2: Organizational Climate also had a significant positive effect on Organizational Support(λ=0.281.Z=5.114. p<0.001). Hence,H2 is accepted.

3.H3: Digital Leadership had a significant direct effect on Teachers' Work performance (λ=0.215, Z=2.422,p<0.05). Thus, H3 is supported.

4.H4: Organizational Climate had a significant direct effect on Teachers' Work performance(λ=0.163, Z=2.601,p<0.01). Hence, H4 is supported.

5.H5: Organizational Support had a strong direct effect on Teachers' Work performance (λ=0.345, Z=3.456,p<0.001).Therefore, H5 is accepted.

From these results, Digital Leadership, Organizational Climate, and Organizational Support have significant direct effects on Teachers' Work Performance.

In addition to the direct effects, the analysis also revealed significant indirect effects, as follows:

1.H6: Digital Leadership had a significant indirect effect on Teachers' Work performance through Organizational Support($a=0.214$, $Z=3.330$,$p<0.001$). Therefore, H6 is accepted.

2.H7: Organizational Climate also had a significant indirect effect on Teachers' Work Performance via Organizational Support ($\lambda=0.097$.$z=2.890$, $p<0.05$). Thus, H7 is supported.

Digital Leadership and Organizational Climate exert significant indirect effects on Teachers' Work Performance, mediated by Organizational Support.

Therefore, in these results, all seven hypotheses (H1-H7) were statistically supported. Both direct and indirect paths are validated, highlighting the critical mediating role of Organizational Support between leadership/climate and teacher outcomes.

Discussion

Discussion of Objective 1: The proposed model fit the empirical data very well. The SEM results demonstrated excellent model fit indices (e.g., GFI = 0.941, AGFI = 0.913, CFI = 0.949, RMSEA = 0.066), indicating that the conceptual relationships among digital leadership, organizational climate, organizational support, and teachers' work performance are statistically sound. This confirms the appropriateness of the theoretical framework developed for this study.Reasons for the results: The structural coherence can be attributed to the growing emphasis on digital transformation in China's vocational education. Administrators in Pingdingshan vocational colleges are expected to lead not only through traditional means but also by integrating digital technologies into administrative practices, which, in turn, shape the organizational climate and support structures (Worapongpat, Arunyakanon, & Rianwilairat, 2025). The interconnectedness between leadership and the working environment promotes teacher efficiency, innovation, and responsiveness to educational reform. From the researcher's perspective, the model's success lies in its relevance to the actual administrative demands of vocational colleges undergoing digital reform (Worapongpat & Boonmee, 2025). A holistic model, as proposed here, is essential for guiding policy and administrative development.

Discussion of Objective 2: The findings of this study confirmed that both digital leadership and organizational climate have significant direct and indirect effects on teachers' work performance in higher vocational colleges in Pingdingshan City. Specifically, the SEM results showed that digital leadership directly influences teacher performance ($\beta = 0.215$, $p < 0.05$), as does organizational climate ($\beta = 0.163$, $p < 0.01$). These results support the hypothesis that leadership and environmental factors are key determinants of teacher effectiveness.The direct effects may be explained by the practical value of digital leadership in fostering innovation, improving efficiency, and enabling real-time communication within schools. Administrators with strong digital skills and data-informed decision-making approaches equip teachers with the tools and clarity needed to perform their duties effectively. Similarly, a positive organizational climate—characterized by mutual respect, transparent communication, fairness, and professional recognition—boosts teacher motivation and performance beyond minimum expectations (Worapongpat, Deepimay, & Kangpheng, 2025).In addition to the direct effects, the study found that organizational support plays a crucial mediating role in these relationships. Digital leadership had a significant indirect effect on teacher performance through organizational support ($\beta = 0.214$, $p < 0.001$), as did organizational climate ($\beta = 0.097$, $p < 0.05$). These findings highlight that effective leadership and a positive climate achieve greater impact when supported by strong internal support systems (Worapongpat & Kangpheng, 2025; Yasuttamathada & Worapongpat, 2025). Teachers who perceive their institutions as caring, responsive, and invested in their success are more likely to translate

leadership direction and organizational culture into high-level performance (Worapongpat, Heebnga, Hadtapranit, Rueangsri, & Sirijon, 2023).

New knowledge

1. Conduct continuous digital training for administrators and teachers organize programs like digital boot camps for new teachers and digital refresh workshops for senior faculty . These should include training on Learning Management Systems (LMS) such as Moodle, Google Classroom, and Edmodo.

2. Promote blended and technology-enhanced Enhanced Learning. Schools should encourage blended learning models in which lecture videos are shared in advance and m-class time is used for discussion and hands-on practice. Establish dedicated EdTech Support Teams in each department to provide real-time assistance to teachers.

3. Create incentive mechanisms and career development pathways, allocate budgets to support teachers who participate in digital innovation competitions, attend external workshops, or publish tech-integrated teaching practices. Launch an internal platform for teachers to share best practices and be recognized by peers.

4. Develop a digital teaching performance dashboard. Each institution should establish a digital dashboard that tracks the frequency, variety, and impact of the digital tools used by teachers. These analytics should inform personalized support and performance feedback.

5. Enhance student-centered digital engagement strategies. Teachers should be encouraged to adopt tools for real-time student feedback, digital portfolios, and self-assessment platforms. Institutions can provide training on how to use analytics to monitor student progress and personalize instruction, in the following figure

Recommendations

Recommendation for Policy Formulation

1. Develop a strategic digital leadership training framework for administrators. Higher vocational colleges should implement structured programs that emphasize data-driven decision-making, ethical integration of digital technologies, and management of digital transformation. For example, short-term certification programs such as “Digital Leadership for Vocational Education 5.0” can be launched in collaboration with IT institutes or universities.

2. Implement innovative administrative and teaching management systems. Institutions should adopt e-Administration systems that include digital scheduling, online registration, internal communication, and performance tracking. Cloud-based shared platforms across colleges in the same city can help reduce costs and improve efficiency.

3. Establish a digital teaching resource sharing platform and mentoring system. Colleges should create a central repository of teaching materials (lesson plans, demo videos, digital tools) accessible to all faculty. A structured Digital Mentor Program should be introduced to support experienced teachers in helping others use technology confidently.

4. Incorporate digital competency into teacher performance appraisal. The annual teacher evaluation should include criteria such as digital innovation in teaching, the integration of technology into lesson planning, and student engagement through digital means. Recognition programs such as " Best Digital Teaching Awards " should be implemented annually.

5. Strengthen school-industry collaboration for teacher professional development. Establish dedicated Industry Partnership Offices at each institution to coordinate internships and factory visits for teachers. Programs like "Teacher-in-Industry Week " should be held annually to expose teachers to real-world applications and enhance their practical teaching skills.

Recommendation for Further Research

1. Explore digital leadership across diverse institutional contexts, conduct comparative studies between urban and rural vocational colleges, or across different provinces to analyze contextual differences in the implementation of digital leadership.

2. Investigate the components and impact of organizational support. Disaggregate organizational support into dimensions such as technical, emotional, and professional support. Examine how each affects teacher motivation and performance.

3. Conduct cross-national comparative studies of successful international models of digital transformation in education from countries like. Finland, Singapore, or South Korea. Adapt their strategies to inform policy and practice in Chinese vocational colleges.

4. Introduce psychological and contextual variables in future models. Future research may include variables such as job satisfaction, technostress, and digital self–efficacy. Employ multi-level modeling to analyze impacts at both individual and institutional levels.

5. Apply longitudinal or mixed-method approaches to study digital leadership effects. Future research should employ longitudinal designs or integrate qualitative methods (e.g., interviews, classroom observations) to capture changes in teacher performance over time and contextual nuances.

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