International Journal of Learning, Teaching and Educational Research
Vol. 24, No. 8, pp. 136-160, August 2025
https://doi.org/10.26803/ijlter.24.8.7
Received Jun 2, 2025; Revised Jul 18 , 2025; Accepted Jul 22, 2025

The Impact of Perceived School Support on Digital Teaching Behavior: The Mediating Role of Digital Teaching Efficacy and Knowledge Sharing

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Abstract: Drawing on social exchange theory (SET), this study examined how perceived school support (PSS) enhances university teachers' digital teaching behavior (DTB) through the serial mediation of digital teaching efficacy (DTE) and knowledge sharing (KS). A survey of 655 university teachers across 11 provinces in China revealed that PSS significantly enhances DTB (direct effect = 0.253, $p < 0.001$). Both DTE and KS mediated the relationship between PSS and DTB, with effect sizes of 0.162 ($p < 0.001$) and 0.057 ($p < 0.001$), respectively. Additionally, DTE and KS demonstrated as a serial mediation pathway, with an effect size of 0.043 ($p < 0.001$). As the first study to validate the sequential DTE→KS pathway in the PSS-DTB nexus, this research extends beyond prior single-mediator models by revealing how school support cascades through efficacy beliefs to collaborative exchanges. These findings demonstrate that institutional support directly and indirectly drive digital teaching through efficacy-building and knowledge-sharing mechanisms. Theoretically, this offers a novel framework for interpreting technology adoption in academia; practically, it provides actionable strategies for administrators while highlighting cross-cultural validation and intervention efficacy as critical future research priorities.

Keywords: Perceived School Support (PSS); Digital Teaching Efficacy (DTE); Knowledge Sharing (KS); Digital Teaching Behavior (DTB); Social Exchange Theory (SET)

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1. Introduction

With the rapid advancement of technologies such as smart devices, the Internet of Things, and Artificial Intelligence, digital education has emerged as a crucial focus in university education reform (Hashim et al., 2021; Luan et al., 2020). In recent years, universities worldwide have increasingly integrated information and communication technology into their teaching practices (Alenezi, 2023). Education systems globally are also ramping up investments in the integration of these technologies (Lawrence & Tar, 2018).

In China, the Ministry of Education has released several initiatives to establish digital education platforms, enhance technical infrastructure, and develop skilled teams. The "Ten-Year Development Plan for Education Informatization (2011-2020)" (Ministry of Education, 2012) clearly outlines the goal of "advancing the integration of information technology with teaching and creating an intelligent teaching environment." The 2022 "Teacher Digital Literacy" standards highlight the ongoing emphasis on integrating information technology into teacher development since the informatization 1.0 era (Ministry of Education, 2022). However, rapid technological progress continues to challenge teachers, particularly in areas like technology access, resources, practical application, motivation, and policy (Liang, 2023; Lu & Shi, 2023).

Research on the factors influencing educators' adoption and sustained use of digital tools has identified several key determinants. Empirical studies have consistently pointed to the significance of institutional support, teachers' digital competency, self-efficacy, and technological stress in shaping digital teaching behaviors (Chou & Chou, 2021; Kaqinari et al., 2021; Nagy & Dringó-Horváth, 2024). For instance, Chou and Chou (2021) found that, during the COVID-19 pandemic, teacher self-efficacy was crucial for adopting online teaching, with technological stress acting as a mediator; interestingly, school support played a relatively minor direct role in their specific context.

Similarly, Sadaf and Gezer (2020), applying the decomposed theory of planned behavior, identified attitude, subjective norms, and perceived behavioral control (encompassing self-efficacy and resources) as key predictors of integration intention, with positive attitude, perceived usefulness, and self-efficacy being the strongest indicators. Furthermore, Luo et al. (2022) suggest that, beyond technical aspects, schools should also focus on supportive accountability policies and fostering collegial relationships to enhance teachers' positive attitudes toward digital systems.

However, despite this growing body of knowledge, significant gaps remain. First, while factors like school support and self-efficacy are recognized as important, the precise mechanisms through which they interact to influence sustained digital teaching behavior are not fully understood. For example, Chou and Chou's (2021) finding on the limited direct impact of school support contrasts with the emphasis placed on institutional factors in frameworks like Luo et al. (2022), suggesting complex mediating pathways might be at play. Second, the role of collaborative factors, such as knowledge sharing among

teachers, as a potential mediator linking school support and efficacy to actual behavior, has received comparatively less attention in the context of digital teaching sustainability. As Nagy and Dringó-Horváth (2024) highlight, the interplay between institutional environment, individual capabilities (like efficacy), and social processes (like knowledge sharing) warrants deeper investigation. Consequently, a consensus on the drivers of teachers' sustained use of digital teaching practices, particularly the mediating pathways, remains elusive. This gap underscores the urgency to investigate the complex interplay of factors influencing university teachers who sustained digital teaching behaviors.

Therefore, this study aims to address these gaps by specifically examining the impact of perceived school support on university teachers' digital teaching behavior, with a focus on the mediating roles of digital teaching efficacy and knowledge sharing. By empirically testing this integrated model, we seek to provide a clearer understanding of how institutional support translates into sustained pedagogical practice in the digital realm.

2. Literature Review and Hypotheses Development

2.1 Theoretical Framework and Research Model

Numerous researchers have utilized the technology acceptance model (TAM) (Natasia et al., 2022) and the theory of planned behavior (TPB) (Liu & Wang, 2023) to investigate technology adoption behavior. TAM emphasizes individuals' attitudes and perceptions toward technology, making it particularly suitable for analyzing teachers' attitudes and intentions when adopting specific digital teaching tools (Davis, 1989). However, it lacks the capacity to explain the complex social dynamics between school support and teacher behavior while contemporary critiques note its limited capacity to explain social-organizational dynamics in educational technology integration (Granić, 2022). While TPB explains behavioral intentions through the lenses of attitude, subjective norms, and perceived behavioral control (Ajzen, 1991), its focus on individual cognition often overlooks systemic influences of organizational support and reciprocity mechanisms (Sadaf & Gezer, 2020).

SET offers a robust alternative by framing teacher-school interactions as reciprocal cost-benefit analyses (Blau, 1964). Recent research suggests that perceived organizational support has a significant positive effect on employee behavior (Thompson et al., 2020; Yu, 2022). Specifically, when schools provide technological and emotional support, teachers interpret this investment as organizational commitment, reducing perceived costs of technology adoption and motivating digital teaching behaviors as reciprocal contributions (Gabbiadini et al. (2023). This SET-driven perspective addresses a critical gap in TAM/TPB by embedding technology adoption within organizational exchange dynamics.

2.2 The Impact of Perceived School Support on Digital Teaching Behavior

SET primarily examines the exchange of rewards and costs in social interactions, emphasizing the roles of reciprocity and trust in relationships (Homans, 1974).

This theory analyzes employee behavior through interpersonal interactions (Chen & Eyoun, 2021). Previous research on perceived organizational support indicated that when organizations value their employees and focus on technological innovation, employees tend to perform better (To & Huang, 2022; Wen et al., 2019).

The transition from traditional to digital teaching requires teachers to acquire more knowledge and skills, and to put in greater effort. In such scenarios, teachers need support to maintain their performance (Maipita et al., 2023). Organizational support is crucial because this transition increases work complexity, requiring teachers to invest more effort than usual (Eisenberger et al., 1986). This includes updating teaching knowledge, adjusting learning formats, preparing new media and teaching materials, and implementing these in actual learning activities (Li & Wang, 2021).

Sredojević et al. (2016) argued that the success of technological investments depends on various internal factors, including organizational readiness, policy support, and knowledge mastery. Lindell (2020) found that, in digital teaching, teachers require organizational support to access digital tools equitably and conveniently, to enhance both their own and their students' knowledge, and to meet course requirements when they cannot do so independently.

Maipita et al. (2023) suggested that organizational support can improve teachers' sensitivity to information technology learning activities. Gabbiadini et al. (2023) studied the impact of organizational support on the willingness to adopt remote teaching technologies post-pandemic and found a significant relationship between organizational support and willingness to use. Based on the above, the following hypothesis is proposed:

H1: Perceived school support has a significant positive impact on digital teaching behavior.

2.3 The Mediating Role of Digital Teaching Efficacy

Eisenberger et al. (1986) proposed the organizational support theory, which posits that employees' job performance and satisfaction improve when they perceive organizational care and support. Rhoades and Eisenberger (2002) further emphasized that elements such as resources and policies significantly shape employees' perceptions. In this study, perceived school support is considered a form of organizational support that influences teachers' teaching behaviors through external factors.

Existing research indicates that for teachers to effectively use technology, they require both technological feasibility and administrative support to overcome external barriers (Shen et al., 2024). School infrastructure, including hardware, software (Drossel et al., 2017), classroom space (Liu et al., 2017), and sufficient bandwidth (Wu et al., 2021), play a crucial role in supporting teachers' practices. Additionally, school policies must ensure that teachers have adequate time for

practice (Merga et al., 2020) and structured application arrangements (Wu et al., 2019).

In addition to external barriers, teachers also face internal challenges in technology use. Chiu (2022) highlighted that meaningful technology integration by teachers requires attention to their well-being and motivation. Teachers' self-efficacy in information and communication technology is a key driver for promoting technology integration (Moreira-Fontán et al., 2019; Yu et al., 2021). Research shows that teachers' self-efficacy is positively correlated with a range of teaching outcomes, behaviors, and well-being, including student motivation, engagement, achievement, self-efficacy, teacher job satisfaction, work commitment, teacher efficacy, and teaching behaviors (Chan et al., 2021; Hagen, 2021; Han et al., 2020; Lauermann & Schwab et al., 2022; Zhao et al., 2021).

Moreover, perceived organizational support (POS) can enhance psychological empowerment (Maan et al., 2020), thereby improving self-efficacy (Musenze et al., 2020). Lu et al. (2023) studied the impact of overqualification on innovative behavior, using creative self-efficacy as a mediating factor. They found creative self-efficacy—an individual's confidence in their ability to produce creative outcomes—serves as a core mechanism for creativity and innovation.

Shen et al. (2024) investigated the factors influencing school support on teachers' technology integration, using information technology self-efficacy as a mediating variable and their findings revealed that teachers' technology integration is influenced by both internal factors (individual emotions) and external factors (school support), with teachers' information technology self-efficacy partially mediating the relationship between perceived school support and technology integration. In summary, the following hypotheses are proposed:

H2: Perceived School Support has a significant positive impact on Digital Teaching Efficacy.
H3: Digital Teaching Efficacy has a significant positive impact on Digital Teaching Behavior.
H4: Digital Teaching Efficacy mediates the relationship between Perceived School Support and Digital Teaching Behavior.

2.4 The Mediating Role of Knowledge Sharing

KS refers to the process by which employees exchange knowledge and collaboratively creates new knowledge (Van den Hooff & de Ridder, 2004). As a key component of knowledge management, KS significantly contributes to an organization's sustained competitive advantage (King & Marks, 2008; Wang & Noe, 2010). However, not all employees are inclined to share their knowledge. Researchers have explored this reluctance from two psychological perspectives. From a cognitive perspective, knowledge is often highly personalized and difficult to articulate, making it challenging to share with others (Javaid et al., 2020). From a motivational perspective, on the other hand, KS presents a dilemma: while it can confer expert status and managerial recognition, it may

also reduce an employee's competitive edge by revealing the secrets of their competitive advantage, thereby making them more vulnerable in a competitive work environment (Wang et al., 2023). Therefore, organizational support is essential to encourage employees to share knowledge (Yang et al., 2018).

Ononye (2023) suggested that organizations should promote more effective collaboration among employees to pool resources and share organizational knowledge more efficiently, thereby enhancing job performance. In their study of knowledge sharing factors among university scholars, Akosile and Olatokun (2019) identified that organizational, personal, and technical factors influence scholars' KS behavior. These include organizational culture, reward systems, management support, and university policies, as well as personal beliefs, guidance, expertise, and the availability of funding/sponsorship.

Moreover, KS impacts on employees' activities and associated work. Through a literature review, Ahmad and Karim (2019) argued that KS influences individuals, teams, and organizations. At the individual level, it affects performance, learning, and creativity. When employees engage in KS, they articulate and solidify their knowledge (Ahmad & Widén, 2018). Numerous studies indicate that KS enhances innovative work behavior (Hu & Zhao, 2016), knowledge creation (Ode & Ayavoo, 2019), and creativity in terms of idea frequency and originality, thereby fostering effective learning and creativity (Mura et al., 2016).

Al-Husseini et al. (2019) argued that since knowledge is embedded within individuals, it is vital for university teachers to share it among organization members to establish new routines for problem-solving. Ononye (2023) examined KS as a mediator in the relationship between perceived organizational support and innovative behavior, discovering that perceived organizational support and trust within an organization can enhance innovative work behavior through tacit knowledge sharing. Accordingly, the following hypotheses are proposed:

H5: Perceived School Support significantly positively impacts Knowledge Sharing.
H6: Knowledge Sharing significantly positively impacts Digital Teaching Behavior.
H7: Knowledge Sharing mediates the relationship between Perceived School Support and Digital Teaching Behavior.

2.5 The Serial Mediating Role of Digital Teaching Efficacy and Knowledge Sharing

SET describes a reciprocal reward process involving two or more social groups (Rasoolimanesh et al., 2015). It has been successfully applied in various fields, particularly in knowledge sharing (Arsawan et al., 2020) and perceived organizational support (Ahmad et al., 2023). Specifically, extrinsic benefits refer to rewards obtained from others, such as bonuses, student awards, honorary roles, and other incentive-based systems (Howard et al., 2021). Participants are

more likely to engage in knowledge sharing when the perceived extrinsic benefits outweigh the costs, such as time invested (Chiu et al., 2023). Additionally, studies have shown that non-monetary rewards, like additional promotion points, can also effectively encourage knowledge sharing (Jia et al., 2022). On the intrinsic side, research links self-efficacy with individuals' confidence in their skills and capabilities (Seikkula-Leino & Salomaa, 2021). For instance, sharing experiences through information and communication technology increases confidence and self-efficacy (Safdar et al., 2020).

POS elucidates how employees perceive organizational concern for their contributions and well-being (Eisenberger et al., 1986). This perception aligns with the extrinsic benefits of knowledge sharing and has been shown to positively influence employee attitudes and behaviors (Hakro et al., 2023). Dong et al. (2019) found that school support and administrative support had a positive impact on teachers' technological self-efficacy and stress levels. Conversely, lack of support results in lower motivation and negative work attitudes. Employees often reciprocate managerial support with improved performance (Melián-González, 2016).

KS involves exchanging personal experiences and expertise, such as communication skills, decision-making, creativity, and problem-solving (Peng et al., 2013). KS influences work behavior, enhancing innovation (Kmieciak, 2020; Sudibjo & Prameswari, 2021) and facilitating knowledge creation (Goswami & Agrawal, 2020), leading to effective learning and creativity (Tran et al., 2021). Ye et al. (2021) found that engaging in discussions and idea exchanges boosts understanding and innovation enthusiasm among employees. Based on these insights, we propose the following hypotheses:

H8: Digital Teaching Efficacy significantly positively influences Knowledge Sharing.
H9: Digital Teaching Efficacy and Knowledge Sharing serve as serial mediators between Perceived School Support and Digital Teaching Behavior.

3. Research Methodology

3.1 Participants and Procedure

This study employed a convenience sampling method for questionnaire distribution, which offers advantages such as lower sample size requirements, cost-effectiveness, and rapid data collection. Based on a quantitative research approach, it aimed to assess the current status of digital teaching application among university faculty in China. Data collection was conducted via the Questionnaire Star platform, incorporating distractor items and a timer functionality to ensure questionnaire validity.

The online survey, distributed through channels including QQ, email, and WeChat, targeted university faculty nationwide over a 15-day period. A total of 700 questionnaires were returned. After screening and removing 45 invalid responses, 655 valid questionnaires were retained for analysis. According to the standard proposed by Sudman (1976), an effective sample size of 500 is sufficient

for research purposes. Therefore, the sample size in this study is deemed appropriate.

3.2 Research Tools

The PSS scale in this study measured the extent to which teachers perceive support from their schools for digital teaching, including policy support, technical support, emotional support, and concern for teachers' interests. Adapted from Eisenberger et al. (1986), Chou et al. (2010), and Nikolopoulou and Kousloglou (2022), the scale comprised three dimensions: policy support, resource support, and emotional support, with 12 items. The DTB scale assessed teachers' use of digital technology in teaching strategies, classroom management, teaching evaluation, teacher-student interaction, and teaching reflection. Adapted from Chou et al.'s (2010) "Continuous Use of E-Teaching Behavior," it included three dimensions: teaching preparation, teaching strategy, and teaching effectiveness, with 14 items.

The DTE scale measured teachers' confidence in using information technology, tools, and resources for teaching, course management, lesson preparation, student activities, and teaching evaluation. Adapted from Chang et al. (2009), it included four dimensions: course design, teaching strategy, technology application, and learning assessment, with 17 items The KS scale evaluates the process of knowledge donation and collection among university teachers and between teachers and universities regarding digital teaching technology and resources. Adapted from Al-Husseini et al. (2019), it included two dimensions: knowledge contribution and knowledge collection, with 10 items. All scales employed the Likert 5-point scoring method (1 = very disagree, 5 = very agree). The research tools are shown in the appendix.

3.3 Data Analysis

This study utilized SPSS 26.0, AMOS 24.0, and the PROCESS macro for statistical data analysis. First, descriptive statistical analysis and correlational analysis were conducted using SPSS 26.0. Next, the reliability of the measurement scales was assessed via Cronbach's alpha coefficients, with a threshold of $\alpha \geq 0.70$ indicating acceptable internal consistency. Construct validity was evaluated through confirmatory factor analysis (CFA) performed in AMOS 24.0.

Concurrently, convergent validity was examined using average variance extracted (AVE ≥ 0.50) and composite reliability (CR ≥ 0.70). Discriminate validity was established by comparing the square root of the AVE for each construct with its correlations to other constructs. To address potential biases arising from the measurement method (e.g., questionnaire design, environment), Harman's single-factor test was conducted for common method bias. Finally, regression analysis was performed using the PROCESS macro to determine the relationships between the variables.

4. Result

4.1 Descriptive Statistics and Correlation Analysis

Descriptive statistical analysis was conducted to assess the average levels of PSS, DTE, KS, and DTB among Chinese university teachers. As shown in Table 1, the

average scores of all items exceeded the midpoint of 3, with small standard deviations. Skewness and kurtosis values (absolute values < 3 and < 10, respectively) indicated a normal distribution, suggesting that PSS, DTE, KS, and DTB were at a medium to high level. Correlation coefficients between variables ranged from .548 to .832, all significant, indicating positive relationships among the variables.

Table 1: Descriptive Statistics Summary Table

Variable	M	SD	Skewness	Kurtosis	PSS	DTE	KS	DTB
PSS	3.393	.802	.240	-1.026	1			
DTE	3.388	.770	.267	-1.135	.622***	1		
KS	3.394	.817	.355	-1.108	.548***	.607***	1	
DTB	3.362	.832	.124	-1.026	.624***	.675***	.607***	1

Note: ***p<0.001.

4.2 Reliability Analysis

This study employed Cronbach's alpha coefficient method to assess the reliability of the questionnaire. A Cronbach's alpha coefficient of .700 or higher was deemed to fall within an acceptable range; conversely, a coefficient of .800 or above was considered ideal, signifying that the dimensions of the scale exhibit strong consistency (Cronbach, 1951). Following Hair et al. (1998), in order to ensure the validity and reliability of the research data, this study employed AMOS for confirmatory factor analysis to evaluate the model fit.

The confirmatory factor analysis primarily examines the following indicators: Absolute fit indices reflect overall model fit; lower values were better, with < 5 acceptable and < 3 indicating good fit (Hayduck, 1987). AGFI and GFI were absolute fit indices, with > 0.8 acceptable and > 0.9 indicating good fit (Hair et al., 2006). SRMR and RMSEA reflect model fit error, with < 0.100 acceptable and < 0.08 indicating good fit (Hair et al., 2006). Incremental fit indices NFI, RFI, CFI, IFI were better when larger, with > 0.800 acceptable and > 0.900 indicating good fit (Bollen, 1989). Parsimony fits indices PNFI and PGFI should be > 0.500, meeting standards (Mulaik et al., 1989). According to Table 2, all indicators of the confirmatory factor analysis were within the acceptable range, and the Cronbach's alpha for reliability tests were all greater than 0.7. Therefore, the model fit of each scale was good, and it had good internal consistency.

Table 2: Model fit and reliability across various dimensions

Fit Category	Index	Criteria	PSS Scale	DTB Scale	DTE Scale	KS Scale	Fit Status
Absolute Fit Indices	$\chi 2/df$	<3	1.920	1.817	1.758	1.843	Fit
	GFI	>.900	.974	0.969	.964	.979	Fit
	AGFI	>.900	.960	0.955	.951	.966	Fit
	SRMR	<.080	.024	.021	.025	.023	Fit
	RMSEA	<.080	.038	.035	.034	.036	Fit
Incremental Fit Indices	NFI	>.900	.976	.975	.967	.981	Fit
	RFI	>.900	.969	.969	.960	.975	Fit
	CFI	>.900	.989	.989	.986	.991	Fit

Fit Category	Index	Criteria	PSS Scale	DTB Scale	DTE Scale	KS Scale	Fit Status
Parsimony Fit Indices	IFI	>.900	.989	.989	.986	.991	Fit
	PNFI	>.500	.754	.793	.804	.741	Fit
	PGFI	>.500	.637	.683	.712	.605	Fit
Reliability Test		Criteria					
Cronbach's Alpha		>0.7	0.894	0.916	.918	.888	

Discriminant validity and convergent validity are collectively termed construct validity. Discriminate validity refers to the low correlations and significant distinctiveness between latent variables. It can be assessed by comparing the square root of the average variance extracted (AVE) with the correlation coefficients between the variables. According to the criterion proposed by Hair et al. (1998), the square root of the AVE for each construct should be greater than the construct's correlations with all other constructs, and this condition should be met for at least 75% of the comparisons to support discriminant validity. Detailed data are presented in Table 3. Within the table, the values in bold represent the square roots of the AVE. These values exceed all corresponding correlation coefficients within their respective rows and columns. Therefore, the discriminant validity of the measurement model in this study is deemed satisfactory.

Table 3: Discriminant Validity Table

Dimension	CD	TS	TA	LA	TP	TS	TE	KC	KA	PS	RS	ES
CD	**.922** α											
TS	.493	**.949** α										
TA	.449	.503	**.927** α									
LA	.426	.495	.470	**.914** α								
TP	.460	.446	.482	.411	**.930** α							
TS	.438	.473	.407	.378	.516	**.945** α						
TE	.444	.449	.406	.399	.521	.502	**.945** α					
KC	.437	.459	.378	.388	.460	.441	.421	**.947** α				
KA	.394	.428	.384	.341	.429	.414	.411	.466	**.921** α			
PS	.353	.416	.369	.385	.414	.445	.410	.360	.418	**.927** α		
RS	.386	.427	.357	.400	.397	.443	.403	.396	.403	.453	**.944** α	
ES	.373	.421	.379	.404	.386	.397	.395	.345	.335	.446	.476	**.916** α

4.3 Analysis of Common Method Bias

To evaluate the potential impact of common method bias on the study's findings, we employed Harman's single-factor test and the variance inflation factor (VIF). First, all questionnaire items were entered into SPSS 21.0 for

exploration factor analysis using principal component analysis. We examined the eigenvalue and variance explained by the first principal component without rotation. The results indicated that the eigenvalue of the first factor was 17.646, accounting for 33.295% of the variance, which was below the commonly accepted threshold of 50% (Zhou & Long, 2004). This suggests that common method bias was unlikely to significantly affect the study's results. Second, we calculated the VIF for all variables, with values of 1.923, 2.251, 1.842, and 2.262 for PSS, DTE, KS, and DTB, respectively. All tolerance values were below 5, indicating no issues of multicollinearity (Marcoulides & Raykov, 2018).

4.4 Model Path Analysis

To test the research hypotheses, this study employed structural equation modeling (SEM) to analyze the data, with the research model depicted in Figure 1. The model fit indices were as follows: χ^2 /df = 1.013, which is below the standard threshold of 3.00 (Hayduck, 1987); GFI = .987, AGFI = .979, NFI = .982, CFI = .999, RFI = .976, and IFI = .999, all exceeding the benchmark of .900 (Doll et al., 1994); PNFI = .715, PCFI = .608, and PGFI = .727, all surpassing the threshold of .500 (Doll et al., 1994); and other fit indices, SRMR = .018 and RMSEA = .004, both below the standard value of .080 (Zhang, 2011). These results indicate that the model exhibits excellent fit and adaptability.

The PROCESS macro in SPSS is well-suited for analyzing mediation effects and is also applicable to serial mediation models involving multiple mediating variables (Demming et al., 2017). Consequently, this study utilized Model 6 within the PROCESS macro of SPSS to examine the serial mediation effect of DTE and KS on the relationship between PSS and DTB (Hayes, 2013). Table 4 presents the regression analysis results. The overall models demonstrated substantial explanatory power. The model predicting DTE explained a significant portion of its variance *(*R^2 = .676, *Adj* R^2= .457). Similarly, the model predicting KS also showed strong explanatory power (R^2 = .657, *Adj* R^2 = .431).

Finally, the model predicting the outcome variable DTB accounted for a large proportion of its variance (R^2 = .670, *Adj* R^2= .448). Within these models, the specific path coefficients revealed that: PSS significantly and positively influences DTB (B = .253, P < .001), supporting H1; PSS significantly and positively affected DTE (B = .461, P < .001), supporting H2; DTE significantly and positively impacted DTB (B = .351, P < .001), supporting H3; PSS significantly and positively influenced KS (B = .248, P < .001), supporting H5; KS significantly and positively affected DTB (B = .230, P < .001), supporting H6; and DTE significantly and positively impacted KS (B = .407, P < .001), supporting H8. The specific regression model is shown in Figure 1.

Table 4: Regression Analysis Results

Item	DTE		KS		DTB	
	β	*t*	*β*	*t*	*β*	*t*
PSS	.461	14.462***	.248	5.750***	.253	6.685***
DTE			.407	8.753***	.351	7.275***
KS					.230	5.693***
R^2	.676		.657		.670	
Adj R^2	.457		.431		.448	
F	151.501***		109.766***		148.734**	

Note: ***p<0.001

Following the methodology suggested by Preacher and Hayes (2008), this study employed the bias-corrected percentile bootstrap method (based on 5,000 bootstrap resamples) to assess the mediation model, with results detailed in Table 5. The total indirect effect was calculated to be 0.514, derived from the total effect minus the total direct effect.

This total indirect effect comprises three distinct indirect paths:
Path 1: PSS→DTE→DTB (Indirect effect = .162, 95% CI [.119, .217])
Path 2: PSS→KS→DTB (Indirect effect = .057, 95% CI [.032, .088])
Path 3: PSS→DTE→KS→DTB (Indirect effect = .043, 95% CI [.027, .066])

The 95% bias-corrected bootstrap confidence intervals for these indirect effects do not include 0, confirming their statistical significance. Additionally, PSS had a significant positive direct effect on DTB (Direct effect = .253, 95% CI [.179, .337]).

These findings indicated that: DTE partially mediated the impact of PSS on DTB. KS partially mediated the impact of PSS on DTB. DTE and KS jointly had a serial mediation effect in the relationship between PSS and DTB. Consequently, hypotheses H4, H7, and H9 were supported by the results.

Table 5: Path Test Results

Path	*β*	LLCI	ULCI	Hypothesis Supported
Direct Path				
PSS→DTB	.253***	.179	.337	H2 Supported
KS→DTB	.230***	.151	.309	H3 Supported
DTE→DTB	.351***	.256	.445	H4 Supported
PSS→KS	.248**	.163	.333	H5 Supported
PSS→DTE	.461***	.398	.523	H6 Supported
DTE→KS	.407***	.316	.499	H7 Supported
Indirect Paths				
PSS→KS→DTB	.057**	.032	.088	H8 Supported
PSS→DTE→DTB	.162***	.119	.217	H9 Supported
PSS→DTE→KS→DTB	.043***	.027	.066	H10 Supported
Total Paths				
Total Direct Path	.253***	.179	.327	
Total Indirect Path	.514**	.448	.581	

Note: ***p<0.001

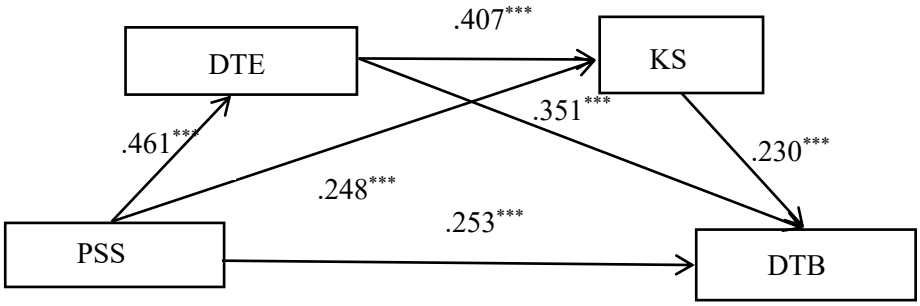

Figure 1: Research Framework

5. Discussion

The findings of this study indicated that PSS has a significant positive impact on DTB, thereby aligning with the findings of Landa et al. (2023), Yang et al. (2023) and Shen et al. (2024). This study further reinforces the important role of teachers' perceived school support in the integration of technology by teachers.

However, this study moves beyond reaffirming this relationship by directly addressing key gaps in literature. Specifically, this study found that KS among teachers in the sampled Chinese universities has a mediating effect between perceived school support and digital teaching behavior. The results of this study indirectly corroborated previous empirical research, indicating that perceived school support promotes knowledge sharing (Mutahar et al., 2021), and that knowledge sharing is beneficial for teachers' innovative teaching behavior (Ye et al., 2021). Ononye (2023) suggested that knowledge sharing has a mediating effect in the relationship between perceived organizational support and teachers' innovative teaching behavior, providing further support for the findings of this study.

Hoang and Le (2024) also noted that if schools provide teachers with sufficient support, it results in them feeling secure and superior when sharing knowledge. A notable, though not entirely unexpected, finding was the comparatively smaller mediating effect size of KS (0.057) than found in studies focused on corporate settings (e.g., Mutahar et al., 2021) or primary/secondary education (e.g., Ye et al., 2021). This may reflect unique characteristics of Chinese academic culture in higher education, where knowledge sharing might be perceived differently or face specific barriers (e.g., competition, time constraints) compared to other sectors or levels. Thus, while PSS enhances KS willingness, the translation into significantly improved DTB via KS in this context appears less pronounced, highlighting the need for targeted interventions to enhance the effectiveness of KS mechanisms in universities.

Again, the findings of this study revealed that the digital teaching efficacy of university teachers in China mediates the relationship between perceived school support and digital teaching behaviors. Similarly, Shen et al. (2024) demonstrated that teachers' technological self-efficacy mediates the relationship between perceived school support and technology integration, which supports

the research findings. According to social exchange theory, when teachers perceive positive benefits from the school, they are more inclined to reciprocate the school's support with practical actions (Rhoades & Eisenberger, 2002). Schools providing resources, technology, policies, and emotional support to teachers can boost their morale, inspire them, and increase their confidence, while also altering their attitudes toward the acceptance of new technologies.

Therefore, when teachers perceive school support, their self-efficacy is enhanced (Musenze et al., 2022). The strong mediating effect of DTE (0.162) underscores its critical role as a primary mechanism through which school support translates into digital teaching action in the Chinese university context, aligning closely with findings from similar Asian contexts (e.g., Shen et al., 2024) but appearing as a more dominant pathway than sometimes reported in Western studies focusing on different efficacy constructs.

Finally, this study found a significant chain mediation effect of DTE and KS between PSS and DTB (B = 0.043). This result reaffirmed the complex interplay of external and internal barriers proposed by Ertmer et al. (2012). School support helps overcome first-order barriers (external: resources, training), enhanced DTE, which in turn facilitates overcoming second-order barriers (internal: attitudes, beliefs) partly through KS, ultimately promoting DTB. While statistically significant, the relatively modest size of this serial pathway compared to the direct effect, or the DTE-only mediation was somewhat unexpected. It suggests that while the sequential process from efficacy to sharing exists, it may not be the most efficient route for translating PSS into DTB in this specific context, or that other unexamined factors might influence the DTE-KS link.

6. Conclusion

This study provides empirical findings on the impact of teachers' PSS on DTB among higher education instructors in China, highlighting the crucial roles of DTE and KS. The results indicated that PSS among higher education instructors in China, exerts a positive influence on DTB. Furthermore, PSS facilitates DTE and enhances teachers' application skills for digital teaching, stimulates their enthusiasm and innovativeness, thereby effectively improving their DTB. Additionally, PSS encourages KS among teachers, fostering the exchange of new technologies and knowledge, which in turn effectively promotes the adoption of digital teaching behaviors.

The relationships among these variables offer the following insights:
First, in response to the challenges posed by digital technologies, institutions should enhance teachers' DTE and application skills by providing training sessions, improving infrastructure, and offering technical support.

Second, institutions should provide policy support for digital teaching, such as offering rewards or recognition to instructors who demonstrate effective use of digital teaching methods.

Third, institutions should encourage and support practices in digital technology education to promote KS among teachers, thereby improving their digital skills and motivating more instructors to utilize digital technologies for teaching. Additionally, it is necessary to address the emotional challenges teachers encounter when transitioning from traditional to digital teaching methods.

7. Limitations and Future Work

This study, based on the social exchange theory model and from the perspective of school administrators, explored the factors influencing digital teaching behavior among Chinese university teachers, with a focus on perceived school support, digital teaching efficacy, and knowledge sharing. However, the research has certain limitations that need to be addressed and improved in future studies. Regarding the sample, this study was limited to university teachers from 11 provinces in China, primarily concentrated in the southwestern region, which may affect the generalizability of the research findings.

Future research could expand the sample scope to include teacher groups from different regions and various types of universities to obtain more representative results. In terms of measurement tools, the perceived school support scale used in this study only includes policy, emotional, and resource dimensions, which may not fully capture all aspects of school support. Future studies could develop more comprehensive measurement tools or incorporate additional variables to enhance the research framework.

8. References

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Appendix

List of items used in this study

Scale	Composition of scales	Title
Scale of Perception School Support (PSS)	Policy Support (PS)	1. My school has clear goals for the development of digital teaching. 2. My school has a clear vision for the development of digital teaching. 3. My school has a professional development strategy for digital teaching. 4. My school has established policies to encourage teachers to integrate digital teaching with traditional teaching.
	Resource Support (RS)	5. My school focuses on the development process needs of teachers transitioning from traditional teaching to digital teaching. 6. My school provides a supportive environment for teachers to conduct digital teaching. 7. My school provides technical support for teachers to conduct digital teaching. 8. My school provides financial support for teachers to carry out digital teaching.
	Emotional Support (ES)	9. My school provides training opportunities for teachers to conduct digital teaching. 10. My school values my contributions to the development of digital teaching. 11. My school is willing to listen to my experiences and insights in conducting digital teaching. 12. My school is willing to listen to the difficulties I encounter in implementing digital teaching.
Scale of Digital Teaching Behaviour (DTB)	Teaching Preparation (TP)	13. I often use the computer to prepare lessons. 14. I often search for electronic teaching resources online to enrich my teaching content. 15. I often send students some electronic learning materials through online platforms for them to prepare in advance. 16. I often familiarize myself with the usage of various online platforms and electronic tools before teaching.
Scale of Digital Teaching Behaviour (DTB)	Teaching Strategies (TS)	17. I often use multimedia, online platforms, and electronic tools to assist in teaching. 18. I often use my own recorded videos or online short videos for teaching during my classes. 19. My partial or complete teaching knowledge is delivered through online teaching.

Scale	Composition of scales	Title
Scale of Digital Teaching Efficacy (DTE)	Teaching Effectiveness (TE)	20. I often initiate interactions with students through digital platforms during my teaching. 21. I often use digital teaching platforms to take attendance for students. 22. I often use digital teaching platforms to receive students' homework after class. 23. I often use digital teaching platforms to check students' extracurricular reading status. 24. I often use digital teaching platforms to answer students' questions after class. 25. I often use digital teaching platforms to assess students' learning outcomes. 26. I often use digital teaching platforms to have students evaluate the effectiveness of the teaching and adjust the pace, difficulty, and methods accordingly.
	Course Design (CD)	27. I have sufficient expertise to teach the course. 28. I am able to formulate comprehensive teaching objectives. 29. I can choose suitable teaching materials, including electronic textbooks. 30. I can arrange the course schedule, including online and offline class times.
	Teaching Strategies (TS)	31. I can choose teaching methods based on the characteristics of the course, including the use of digital resources. 32. I can use effective teaching methods to improve students' grades. 33. I am able to effectively utilize various digital teaching tools and platforms in the classroom to maintain students' attention. 34. I can utilize various digital teaching tools and platforms to stimulate and maintain students' interest in learning. 35. I am able to use various digital teaching tools and platforms to stimulate students' higher-order thinking skills and interaction abilities.
Scale of Digital Teaching Efficacy (DTE)	Teaching Strategies (TS)	36. I am able to use various digital teaching tools and platforms to provide after-class tutoring and answer questions for students.
	Technology Application (TA)	37. I can use digital teaching resources to enrich my teaching content. 38. I am able to choose appropriate digital teaching media to enhance my teaching. 39. I am proficient in creating teaching multimedia courseware, teaching videos, and other digital

Scale	Composition of scales	Title
Scale of Knowledge Sharing (KS)	Learning Assessment (LA)	teaching materials. 40. I am able to flexibly utilize various digital teaching tools, platforms, and equipment. 41. I can better assess students' learning outcomes through digital teaching tools and platforms. 42. I believe my teaching evaluation methods align with my teaching objectives. 43. I can improve my teaching based on the assessment results.
	Knowledge Contribution (KC)	44. I share knowledge with my colleagues, and my peers in the same department consider it normal. 45. I share knowledge with colleagues, and colleagues outside my department consider it normal. 46. When I learn new knowledge about teaching techniques, I share it with my colleagues within my department. 47. When I learn new knowledge about teaching techniques, I share it with colleagues outside my department. 48. When colleagues from my department ask me to share information, I am very willing to share it with them. 49. When colleagues from outside my team/department ask me to share, I am very willing to share with them.
Scale of Knowledge Sharing (KS)	Knowledge Acquisition (KA)	50. When my colleagues in the department learn something new about teaching technology, they will tell me. 51. When colleagues from outside my department learn something new about teaching technology, they will tell me.
	Knowledge Acquisition (KA)	52. When I ask my colleagues in my department about technical questions, they share their knowledge with me. 53. When I consult colleagues outside my department about technical questions, they share their knowledge with me.