

## **A Structural Equation Model of Causal Factors Influencing Teachers’ Instructional Management in the Thonburi University School Network, Thailand**

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### **Abstract**

This study aimed to examine a structural equation model of causal factors influencing teachers’ instructional management and to investigate guidelines for promoting instructional management among teachers in the Thonburi University school network. The study employed a mixed-methods research design, incorporating both quantitative and qualitative approaches. The sample consisted of 392 teachers selected through cluster random sampling. The research instruments consisted of a questionnaire with a reliability coefficient of 0.97 and an interview protocol that had been validated for content validity, with a content validity index (IOC) of 1.00. Quantitative data were analyzed using descriptive statistics and partial least squares structural equation modeling (PLS-SEM), while qualitative data were analyzed using content analysis.

The findings revealed that the structural equation model demonstrated a good fit with the empirical data and explained a high proportion of variance in teachers’ digital literacy and instructional management. Teachers’ digital literacy exerted the strongest direct effect on instructional management and served as a key mediating variable between organizational contextual factors and instructional management. In addition, the proposed guidelines emphasized the development of supportive school environments and learning-oriented organizational cultures, together with the enhancement of digital literacy among teachers and students, to promote learner-centered instructional management aligned with societal changes and future labor market demands. These findings indicate that

improving teachers’ instructional management within school network contexts should be primarily driven by strengthening teachers’ digital literacy as a core mechanism.

**Keywords:** Structural Equation Modeling, Causal Factors, Teachers’ Instructional Management, School Network

## Introduction

Education is a crucial mechanism for human resource development, aiming to equip learners with knowledge, competencies, and desirable attributes necessary for quality living and effective participation in society. In the context of the rapidly changing 21st century, countries worldwide, including Thailand, have placed increasing emphasis on continuous educational development, with a focus on cultivating learners who are knowledgeable, critical thinkers, and capable of applying knowledge in practice. This approach has been implemented through the adaptation of instructional processes to align with societal changes, integrating active learning, modern technologies, and the ethical use of digital technologies in order to enhance learners’ competencies and strengthen teachers’ professional capacities for the 21st century (Office of the Education Council, 2017; Office of the Basic Education Commission, 2025). Teachers play a pivotal role in instructional management and the enhancement of educational quality by designing and implementing learning processes to achieve intended outcomes. Numerous studies have indicated that teachers’ instructional management significantly influences students’ academic achievement and engagement, underscoring teacher quality as a critical factor in students’ educational success (Engida et al., 2024; Rudin et al., 2024). However, effective instructional management does not rely solely on teachers’ individual capacities but also requires supportive contextual factors within schools, including the learning environment, organizational culture, and teachers’ digital literacy.

The school environment is a key factor that facilitates instructional management, encompassing both the learning atmosphere and the availability of instructional resources. A supportive school environment influences teachers’ instructional practices and students’ learning outcomes, as it enables teachers to manage learning more effectively and enhances student engagement (Fraser, 2012; Khudadad & Mickelson, 2021). In addition,

organizational culture—reflected through shared values, practices, and institutional structures—plays a significant role in shaping teachers’ work behaviors and instructional effectiveness. An organizational culture that supports learning and innovation can significantly enhance teachers’ competencies and the effectiveness of instructional management (Daft, 2008; Tiwa Lowpasee & Jittirat Sangloetuthai, 2017). Furthermore, digital literacy is a critical competency for teachers in the 21st century. It encompasses the ability to use digital technologies, communicate effectively, think critically, and apply technology ethically. Teachers with high levels of digital literacy are better able to design and integrate technology into instructional management, thereby promoting student engagement and improving the overall effectiveness of the learning process (Ng, 2012; Hatlevik et al., 2015).

Although the Thonburi University School Network places emphasis on teachers’ professional development and the promotion of digital literacy, practical implementation reveals several challenges. Some teachers still lack sufficient knowledge, skills, and confidence in using digital technologies for instructional management. In addition, schools—particularly private institutions—face constraints related to resources and budgets, which limit the effective integration of technology into teaching and learning processes. These findings are consistent with previous studies indicating that educational institutions often encounter limitations in resources, personnel, and infrastructure, thereby hindering the effective development of instructional management. Moreover, variations in teachers’ knowledge and experience in instructional design and technology use result in limited diversity of learning activities. Inadequate systems for assessment, evaluation, and data management further exacerbate these challenges. Collectively, these factors constitute significant barriers to the effective development of instructional management (Supreeya Traiyakhan & Rachata Suvannagoot, 2022; Chuthamas Chomthong, 2025).

Based on the aforementioned issues, there is a clear need for an empirical investigation to systematically explain the causal relationships among school environment, organizational culture, and teachers’ digital literacy influencing instructional management. Employing structural equation modeling allows for a comprehensive examination of these relationships. The findings of this study are expected to address existing knowledge gaps and provide practical guidelines for enhancing instructional management and

improving educational quality within the context of the Thonburi University School Network.

## **Content**

### **1. Research Objectives**

1.1 To examine a structural equation model of causal factors influencing teachers’ instructional management within the Thonburi University School Network.

1.2 To explore guidelines for promoting teachers’ instructional management within the Thonburi University School Network.

### **2. Research Hypotheses**

H1: The school environment has a direct effect on teachers’ instructional management.

H2: The school environment has a direct effect on teachers’ digital literacy.

H3: Organizational culture has a direct effect on teachers’ instructional management.

H4: Organizational culture has a direct effect on teachers’ digital literacy.

H5: Teachers’ digital literacy has a direct effect on teachers’ instructional management.

### **3. Expected Contributions**

This study provides a valid and robust structural equation model that explains the causal factors influencing teachers’ instructional management. The findings and empirical evidence derived from this research offer valuable guidance for school administrators to apply in promoting and enhancing teachers’ professional capacity in alignment with the specific contexts of their institutions. Ultimately, the results support the development of instructional management practices that effectively respond to learners’ needs.

### **4. Conceptual Framework**

The development of the conceptual framework was based on a synthesis of relevant literature, theories, and previous studies. School environment, organizational culture, and digital literacy were identified as latent variables influencing teachers’ instructional management, drawing on the conceptual foundations proposed by Tableman

(2004), Daft (2008), and Hatlevik et al. (2015), respectively. Teachers’ instructional management was conceptualized based on the framework of Terrell Shockley et al. (2024). Based on this conceptual framework, a structural equation model was developed to explain the causal relationships among the study variables. The proposed model was empirically tested using Partial Least Squares Structural Equation Modeling (PLS-SEM), as illustrated in Figure 1.

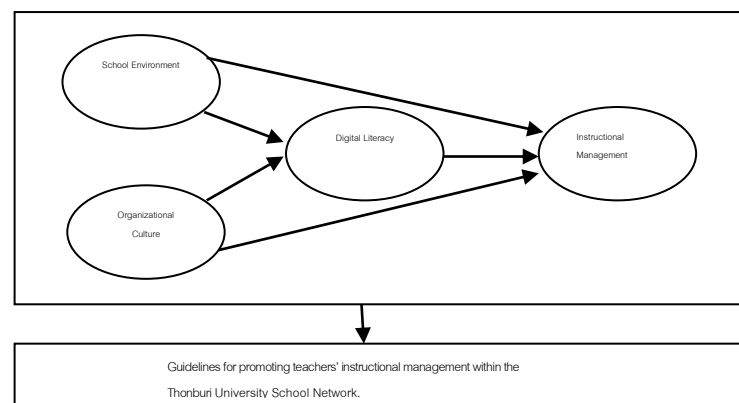


Figure 1. Research Conceptual Framework

## 5. Research Methodology

This study employed a mixed methods research design, integrating quantitative and qualitative approaches. The quantitative component focused on examining causal relationships among the study variables through Partial Least Squares Structural Equation Modeling (PLS-SEM) using the SmartPLS software. The qualitative component involved content analysis of data obtained from in-depth interviews, which was used to support, explain, and enrich the quantitative findings.

### 5.1 Population, Sample, and Key Informants

The population of this study consisted of 2,823 teachers from 28 schools within the Thonburi University School Network. The sample size was determined using Daniel Soper’s sample size calculator for structural equation modeling, with an assumed effect size of 0.20, a statistical power of 0.80, four latent variables, and twelve observed variables. The calculation indicated a minimum required sample size of 339 participants. Cluster random sampling was employed by randomly selecting 14 schools, and the

sample size was increased to 392 teachers to account for potential data loss and to enhance the stability of statistical estimations.

The key informants for the qualitative component were five teachers from the Thonburi University School Network, selected through purposive sampling. The selection criteria included having at least five years of teaching experience and being recognized for effective instructional management within the school network.

## 5.2 Research Instruments

Two types of research instruments were employed in this study: a quantitative instrument in the form of a questionnaire and a qualitative instrument consisting of a structured in-depth interview guide. The details are as follows.

### 5.2.1 Questionnaire

The questionnaire was developed based on relevant concepts, theories, and previous studies. It consisted of a checklist and a five-point Likert-scale format. The questionnaire comprised four sections: (1) respondents' demographic information; (2) factors influencing teachers' instructional management, including school environment, organizational culture, and digital literacy; (3) teachers' instructional management, covering curriculum, teaching, and assessment and evaluation; and (4) open-ended questions soliciting suggestions regarding teachers' instructional management. Content validity was examined by a panel of experts, and the Item-Objective Congruence (IOC) index was calculated. Items with IOC values of 0.67 or higher were retained. The questionnaire was subsequently revised based on expert feedback and pilot-tested with 30 participants who were not part of the main sample. The overall reliability of the questionnaire was found to be 0.97.

### 5.2.2 Interview Instrument

The interview instrument was a structured in-depth interview designed to synthesize guidelines for promoting teachers' instructional management. The interview was divided into two sections as follows: (1) issues concerning opinions on the school environment, organizational culture, and digital literacy affecting teachers' instructional management in schools within the Thonburi University school network; and (2) issues concerning teachers' instructional management, covering curriculum, teaching and learning management, and measurement and evaluation. The interview questions

were examined for content validity by a panel of experts. Items with an Index of Item-Objective Congruence (IOC) value of 0.67 or higher were selected, and the items that met the criteria obtained an IOC value of 1.00. Subsequently, the questions were revised to enhance clarity and appropriateness before being used for actual data collection.

### 5.3 Data Collection

Data were collected from both secondary and primary sources. Secondary data were obtained through document research, including a review of relevant literature and previous studies, to inform the conceptual framework and identify causal factors influencing teachers’ instructional management. Primary data were collected using questionnaires and structured in-depth interviews administered to the study sample and key informants.

### 5.4 Statistical Analysis

Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to analyze the quantitative data. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed using the SmartPLS software to assess both the measurement model and the structural model. Qualitative data obtained from in-depth interviews were analyzed using content analysis.

## 6. Research Results

Based on the examination of the structural equation model of causal factors influencing teachers’ instructional management in the Thonburi University School Network, the research findings can be summarized as follows.

6.1 The results of the structural equation model analysis examining causal factors influencing teachers’ instructional management in the Thonburi University school network include an assessment of the measurement model quality, an evaluation of discriminant validity using the Heterotrait-Monotrait (HTMT) criterion, and an analysis of the structural model. This also involves testing direct and indirect effects as well as the mediating role of the latent variables, as presented in Tables 1-3.

Table 1. Measurement Model Summary

<b>Construct</b>	<b>CR</b>	<b>AVE</b>
ENVI	0.953	0.646
CULT	0.967	0.728
DIGT	0.950	0.681
LEARN	0.927	0.595

From Table 1, the results indicate that the measurement model demonstrates very good quality for all latent constructs—school environment (ENVI), organizational culture (CULT), teachers’ digital literacy (DIGT), and instructional management (LEARN). All constructs exhibit composite reliability (CR) values ranging from 0.927 to 0.967, exceeding the recommended threshold and indicating a high level of internal consistency. Furthermore, the average variance extracted (AVE) values for all constructs exceed 0.50, confirming adequate convergent validity.

Table 2. Heterotrait–Monotrait (HTMT) Matrix

<b>Construct</b>	<b>ENVI</b>	<b>CULT</b>	<b>DIGT</b>	<b>LEARN</b>
ENVI	-			
CULT	0.872	-		
DIGT	0.813	0.852	-	
LEARN	0.834	0.791	0.88	-

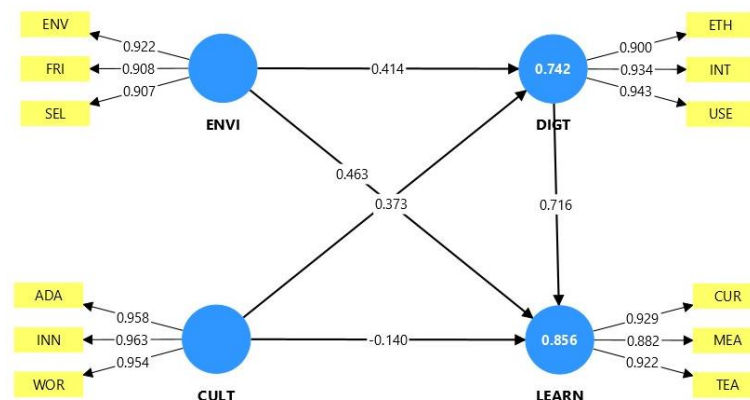
From Table 2, the HTMT values among all pairs of latent constructs range from 0.791 to 0.880, which are below the recommended threshold of 0.90 proposed by Henseler et al. (2016). These results indicate that the measurement model demonstrates an acceptable level of discriminant validity. Although the HTMT value for some construct pairs—particularly between teachers’ digital literacy (DIGT) and instructional management (LEARN)—is relatively high (HTMT = 0.880), it does not exceed the recommended cutoff. This finding suggests that the latent constructs remain conceptually distinct. Moreover, the relatively high HTMT value between DIGT and LEARN is consistent with the results of the structural model analysis, which revealed that DIGT has a strong direct effect on LEARN. Overall, the measurement model exhibits adequate quality and is appropriate for subsequent structural equation modeling analysis.

Table 3. Structural Model Results

Independent Variable	Dependent Variable	Direct Effect ( $\beta$ )	Indirect Effect	Total Effect	f <sup>2</sup>	t	p	R <sup>2</sup>
ENVI	DIGT	0.414	-	0.414	0.089	2.489*	0.013	0.74
CULT	DIGT	0.463	-	0.463	0.112	2.729*	0.006	
ENVI	LEARN	0.373	0.296	0.669	0.119	3.935**	0.000	0.85
CULT	LEARN	-0.140	0.332	0.192	0.016	1.116	0.264	
DIGT	LEARN	0.716	-	0.716	0.917	8.361**	0.000	

Note:  $\beta$  = standardized path coefficient; f<sup>2</sup> = effect size; R<sup>2</sup> = coefficient of determination of endogenous constructs. \*p < .05, \*\*p < .01.

From Table 3, the structural equation model explains 74% of the variance in teachers’ digital literacy (DIGT) and 85% of the variance in instructional management (LEARN), both of which are considered high, indicating a good overall explanatory power of the model. The path analysis results reveal that teachers’ digital literacy has a very strong direct effect on instructional management ( $\beta = 0.716$ , p < .001) and represents the most influential factor in the model. In addition, both school environment (ENVI) and organizational culture (CULT) exert significant direct effects on teachers’ digital literacy. Moreover, school environment has a significant direct effect on instructional management, whereas organizational culture does not exhibit a significant direct effect on instructional management. These findings suggest that teachers’ digital literacy functions as a key causal mechanism mediating the influence of organizational context on instructional management. The structural model is illustrated in Figure 2.



SRMR = 0.051, d\_ ULS = 0.207, d\_ G = 0.434 ,Chi-square 232.470, 0.850

Figure 2. Causal Factor Model Influencing Teachers’ Instructional Management in the Thonburi University School Network

## 6.2 Results on Guidelines for Promoting Teachers’ Instructional Management in the Thonburi University School Network

### 6.2.1 School Environment

The informants emphasized that both indoor and outdoor learning environments should be designed to be safe, supportive of learning, and conducive to positive interactions with students. They suggested providing students with opportunities to exercise autonomy in choosing learning activities aligned with their interests, taking individual developmental differences into account, and promoting experiential, student-centered learning practices.

### 6.2.2 Organizational Culture

The informants reached a consensus that organizational culture should encourage teachers’ autonomy in designing and implementing instructional practices. Such a culture should support participation, open communication, the exchange of ideas, and learning from mistakes. In addition, clearly defined roles and responsibilities were viewed as essential for enhancing the effectiveness of teachers’ instructional management.

### 6.2.3 Digital Literacy

A key issue highlighted by the informants was the development of digital literacy among both teachers and students. They emphasized the importance of supporting the use of technology as a learning tool alongside the development of self-directed learning skills. Furthermore, fostering constructive, safe, and responsible communication in digital environments was identified as a critical component of digital literacy development.

### 6.2.4 Teachers’ Instructional Management

The informants suggested that instructional management should be aligned with labor market demands and ongoing changes in Thai society. Instruction should aim to develop students’ adaptability, career readiness, and life skills for the future. This approach should emphasize student-centered learning, active learning strategies, the integration of theory with real-world practice, and assessment practices that support continuous improvement. These findings reflect the necessity of redefining teachers’ roles to align with societal transformation and the evolving world of work.

## 7. Discussion

Based on the results of the statistical hypothesis testing, the findings can be discussed in relation to the research objectives as follows.

### 7.1 Structural Equation Model of Causal Factors Influencing Teachers' Instructional Management in the Thonburi University School Network

The results of the structural model fit assessment indicated that the SRMR value was 0.051, which is below the recommended threshold of 0.08 and close to the more stringent criterion of 0.05. This suggests that the model exhibits a low level of overall discrepancy. In addition, the  $d_{ULS}$  and  $d_G$  values were lower than the upper bounds obtained from the bootstrapping analysis at both the 95% and 99% confidence levels, indicating that the model demonstrates a good fit with the empirical data according to the PLS-SEM guidelines (Hair et al., 2019; SmartPLS, n.d.). Regarding the explanatory power of the model, the school environment and organizational culture jointly explained 74% of the variance in teachers' digital literacy ( $R^2 = 0.74$ ). Meanwhile, the school environment, organizational culture, and teachers' digital literacy together accounted for as much as 85% of the variance in teachers' instructional management ( $R^2 = 0.85$ ), which is considered a very high level according to the criteria proposed by Hair et al. (2019). These findings indicate that the developed structural equation model has strong explanatory power in elucidating the causal relationships among the studied variables.

The causal path analysis revealed that both the school environment and organizational culture exerted significant positive effects on teachers' digital literacy. This finding is conceptually consistent with prior studies highlighting the influence of organizational and school-related factors on teachers' ICT-related practices and work outcomes, which emphasize the critical role of school context and organizational culture in fostering teachers' technological competencies (Ferede et al., 2022; Erdem et al., 2025). Moreover, teachers' digital literacy demonstrated a strong direct effect on instructional management. This finding aligns with previous studies (Ngao, 2025; Yetis, 2025), which reported that teachers' digital competencies are key factors facilitating instructional design, the integration of technology into teaching and learning, and the enhancement of students' learning quality.

The mediation analysis further indicated that teachers’ digital literacy partially mediated the relationship between the school environment and teachers’ instructional management, while fully mediating the relationship between organizational culture and teachers’ instructional management. These results suggest that organizational culture cannot directly influence teachers’ instructional management unless it is translated into practical competencies through teachers’ digital literacy. This finding is consistent with the systems perspective proposed by Henseler (2016), which posits that contextual factors tend to influence outcomes through process mechanisms rather than through direct effects.

7.1.1 The findings revealed that the school environment had a statistically significant direct effect on teachers’ instructional management in the schools within the Thonburi University network. This indicates that an appropriate school environment plays a crucial role in supporting and enhancing the quality of teachers’ instructional management. This result is consistent with the study of Seddhawudh Thadasirithanasakoon (2024), which found that the school environment directly influences teachers’ instructional management through multiple dimensions, including resources and materials, the organization of learning spaces that facilitate instructional activities, the availability of diverse learning resources, and opportunities for professional development such as training programs, seminars, and collaborative learning within the organization. These findings suggest that when schools provide a supportive learning environment in both physical and social dimensions, teachers are better able to design and implement effective instructional practices. This conclusion is in line with Tony (2019), who noted that effective management of school facilities and infrastructure has a direct impact on the quality of teaching and learning. Furthermore, the conceptual framework proposed by Wisana Abdulloh and Wuttichai Niemted (2020) helps explain the present findings by emphasizing that effective instructional management is a key component of 21st-century learning, as the role of teachers has shifted from knowledge transmitters to learning facilitators. This role transformation requires learning environments that support hands-on learning, self-directed knowledge construction, and the holistic development of learners.

7.1.2 The findings indicated that the school environment had a statistically significant direct effect on teachers’ digital literacy in the schools within the Thonburi University network. This result highlights that a learning environment supportive of learning and technology use plays a crucial role in enhancing teachers’ digital knowledge, understanding, and skills. This finding is consistent with the study of Rasdiana et al. (2024), which demonstrated that the school environment exerts a direct influence on teachers’ digital literacy, and that such digital literacy subsequently affects the effectiveness of instructional management. The present results further support the proposition that teachers’ digital literacy should not be viewed merely as an individual competence, but rather as an outcome shaped by a supportive organizational context and working environment. This perspective is aligned with the study of Pisut Srichan (2019), which found that institutional support for technology enables teachers to access and continuously use digital tools, thereby contributing to the development of students’ digital skills through teachers’ instructional practices. Moreover, the conceptual framework proposed by Aekkaphob Intarapoo and Panita Wannapiroon (2021) helps explain the findings of this study by emphasizing that the provision of an intelligent digital learning environment plays a vital role in promoting learning, facilitating interaction between teachers and learners, and enabling timely problem-solving in instructional processes. These conditions are essential for fostering teachers’ digital literacy within the school context.

7.1.3 The findings revealed that organizational culture did not have a statistically significant direct effect on teachers’ instructional management in the schools within the Thonburi University network, which was inconsistent with the proposed hypothesis. However, the mediation analysis indicated that organizational culture exerted a statistically significant indirect effect on teachers’ instructional management through teachers’ digital literacy, with an indirect effect value of 0.332, indicating full mediation. These results suggest that organizational culture alone cannot directly influence teachers’ instructional management unless it is translated into practical competencies through teachers’ digital literacy. In other words, organizational values, policies, or climate by themselves may be insufficient to bring about changes in instructional practices if teachers lack the necessary digital knowledge, understanding, and skills to effectively integrate technology into teaching and learning. This finding is

consistent with the perspective of Tanavich Sudngulueam (2025), who argued that digital transformation leads to changes in school organizational structures and values; however, such influences do not typically manifest directly at the level of instructional practices, but rather through the development of teachers’ capacities and competencies, particularly digital literacy. Moreover, the present findings align with the study of Setyawan et al. (2022), which found that supportive, achievement-oriented, and collaborative school cultures significantly enhance teachers’ digital skills and digital knowledge. These digital competencies, in turn, have a direct impact on teaching effectiveness and function as a mediating mechanism linking school culture to teachers’ instructional management outcomes.

7.1.4 The findings indicated that organizational culture had a statistically significant direct effect on teachers’ digital literacy in the schools within the Thonburi University network. This suggests that organizational values, practices, and the working climate that support learning and technology use play a crucial role in enhancing teachers’ digital capacity. This finding is consistent with the study of Rasdiana et al. (2024), which reported that school culture has a significant influence on teachers’ digital skills and digital knowledge, particularly cultures that promote collaborative learning, knowledge sharing, and innovation. In contrast, rigid or highly hierarchical cultures may constrain the development of such competencies. Furthermore, the results support the proposition that teachers’ digital skills and digital knowledge function as a key mechanism linking the influence of organizational culture to teachers’ work outcomes and instructional management. This is consistent with the findings of Seddhawudh Thadasirithanasakoon (2024), who found that organizational culture exerts a statistically significant direct effect on teachers’ digital literacy. From a theoretical perspective, Schein’s (2010) concept of organizational culture explains that culture emerges from shared learning experiences among organizational members and serves to shape collective assumptions, values, and work practices, thereby influencing patterns of learning and the development of personnel competencies. At the same time, the perspective of Kanokkan Noipoung (2024) emphasizes that the development of teachers’ digital skills requires collaborative learning, teamwork, and learning motivation, highlighting

the importance of an organizational culture that systematically supports the enhancement of teachers’ digital capacity.

7.1.5 The findings revealed that teachers’ digital literacy had a statistically significant direct effect on instructional management among schools in the Thonburi University network. This indicates that teachers’ levels of digital knowledge, understanding, and technological skills play a direct role in their ability to implement the curriculum, design learning activities, and effectively assess student learning outcomes. This finding is consistent with Paetsch et al. (2023), who reported that information and communication technology (ICT) literacy influences teachers’ confidence in integrating technology into instruction and has a direct effect on the actual use of technology in the teaching and learning process. In addition, Raave et al. (2024) emphasized that effective technology integration in teaching does not depend solely on the availability of technological tools, but rather on teachers’ ability to select and apply technologies in ways that align with instructional objectives and learning goals. Accordingly, the present study suggests that teachers with higher levels of digital literacy are better able to make informed decisions regarding the appropriate selection and application of digital technologies, which serves as a key mechanism through which digital literacy directly enhances the quality of instructional management. This finding is further supported by the framework proposed by Jurarat Thammaprteep (2016), who argued that high-quality learning management in the digital era requires the integration of content knowledge, pedagogical knowledge, and technological knowledge, as conceptualized in the TPACK framework. In particular, technological knowledge and skills constitute a foundational component for designing and implementing effective learning activities. If teachers possess limitations in digital competence, instructional management may fail to achieve its intended outcomes, even when content knowledge and pedagogical approaches are appropriate.

7.2 Guidelines for Promoting Teachers’ Instructional Management in the Thonburi University School Network

The qualitative analysis of data obtained from key informants indicates that promoting teachers’ instructional management requires an integrated approach across three main dimensions: the school environment, organizational culture, and teachers’ digital literacy. This integrated development is essential to support flexible, high-quality

instructional management that can effectively respond to societal changes in the digital era. These guidelines are consistent with the results of the structural equation modeling (PLS-SEM) analysis, which revealed that the three factors exert different patterns of influence on teachers' instructional management. Specifically, the school environment has both direct and indirect effects on instructional management, whereas organizational culture influences instructional management only through teachers' digital literacy. Moreover, teachers' digital literacy was found to be the factor with the strongest and most statistically significant direct effect on instructional management. These findings highlight the role of digital literacy as a key causal mechanism linking contextual factors within educational institutions to teachers' actual instructional practices. This is consistent with the teacher development framework for education in the digital era proposed by Dusadee Sarabut and Banjong Lawalee (2025), who argued that teachers in the 21st century must possess digital skills and the ability to design technology-integrated learning experiences, while acting as facilitators of learning and creating environments that promote active learning. Furthermore, the finding that organizational culture does not have a direct effect on teachers' instructional management helps explain that the transformation of teachers' roles into learning facilitators cannot be achieved solely through policy-oriented values or organizational-level guidelines. Instead, it requires teachers' digital competence as a crucial practical mechanism for translating conceptual principles into actual instructional practices. This interpretation aligns with Phantharakphong and Liyanage (2026), who pointed out that Thailand's teacher development system tends to emphasize compliance with policy requirements rather than development that responds to teachers' real instructional contexts, resulting in a gap between policy objectives and teachers' professional needs in practice.

## **8. Recommendations**

### **8.1 Practical and Policy Implications**

Based on the research findings indicating that teachers' digital literacy functions as the central mechanism through which the school environment and organizational culture influence teachers' instructional management, the following recommendations are proposed for school administrators, supervising agencies, network administrators, and teachers.

#### 8.1.1 Policy implications for school administrators and supervising agencies

School administrators and supervising agencies should prioritize the systematic development of teachers’ digital literacy by establishing clear policies that position digital literacy as a core competency within professional teaching standards. Such policies should be explicitly linked to performance appraisal systems and continuous professional development frameworks. In addition, adequate budget allocation and resource provision are essential to support technological infrastructure, including internet connectivity, digital learning platforms, and technical support systems. These measures will help create an enabling environment that facilitates the effective use of digital technologies and supports the sustainable development of teachers’ digital literacy, thereby enhancing instructional management in practice.

#### 8.1.2 Practical implications for network administrators

Network administrators should design academic programs and community service initiatives that emphasize the development of practical digital competencies rather than focusing solely on theoretical training. Professional development activities should be organized through collaborative learning approaches, such as digital professional learning communities (PLCs), coaching and mentoring systems, and the systematic exchange of best practices in technology-integrated instructional management. These approaches can strengthen teachers’ hands-on digital skills and promote the effective application of digital technologies in instructional practices.

#### 8.1.3 Practical implications for teachers

Teachers should engage in continuous self-development across three core dimensions of digital literacy: (1) the effective use of digital technologies for instructional purposes; (2) critical thinking and the evaluation of digital information; and (3) ethical and responsible use of digital technologies. Strengthening these competencies will enable teachers to design and implement instructional activities that effectively respond to learners’ needs in the digital era and enhance the quality of instructional management.

## 8.2 Recommendations for Future Research

Given the findings that organizational culture does not directly influence teachers’ instructional management but exerts its effects through teachers’ digital literacy, the following recommendations are proposed for future research.

8.2.1 Future studies should investigate the underlying mechanisms or intervening factors through which organizational culture is translated into instructional practices. Potential factors include instructional leadership, teacher professional development systems, and teachers’ motivation to integrate digital technologies into teaching and learning processes.

8.2.2 Future research should expand the scope of the sample to include diverse educational contexts, such as schools under different administrative authorities, non-formal and informal education centers, special education institutions, and early childhood development centers. In addition, incorporating moderating variables-such as teaching experience, grade level, or subject area-would provide deeper insights into contextual and group-level differences in the relationships among the study variables.

## Conclusion

The quantitative findings from the structural equation modeling analysis of causal factors influencing teachers’ instructional management in the Thonburi University School Network confirmed that the developed structural equation model demonstrated a high level of consistency with the empirical data. Teachers’ digital literacy emerged as the most influential causal mechanism exerting a direct effect on teachers’ instructional management and functioning as a key mediating variable through which the effects of the school environment and organizational culture were transmitted to teachers’ instructional management. Although organizational culture did not have a direct effect on teachers’ instructional management, it exerted a statistically significant indirect effect through the development of teachers’ digital literacy. In contrast, the school environment influenced teachers’ instructional management through both direct and indirect pathways.

The qualitative findings derived from the investigation of guidelines for promoting teachers’ instructional management, based on the perspectives of key informants, were

consistent with the quantitative results. The informants emphasized the importance of establishing learning environments conducive to learning, fostering an organizational culture that supports collaborative learning, and enhancing teachers’ digital competencies alongside the adaptation of instructional management practices to align with societal contexts and future labor market demands. These findings reflect that the development of teachers’ instructional management requires an integrated approach at both the individual and organizational levels.

In conclusion, this study indicates that enhancing the quality of teachers’ instructional management within the Thai educational context requires prioritizing the development of teachers’ digital literacy as a central focus, in parallel with the systematic development of organizational contexts and learning environments within schools. Such an approach is likely to generate positive impacts on instructional effectiveness, student learning quality, and schools’ readiness to adapt to changes in the digital society. However, if educational institutions emphasize policy formulation or the establishment of organizational culture without a serious commitment to developing teachers’ digital competencies, policy-driven changes may fail to translate into concrete instructional practices, potentially resulting in a lack of continuity and long-term sustainability in the development of instructional management.

## References

- Abdulloh, W., & Niemted, W. (2020). Arrangement of Learning Environment to Promote Learning Skills in the 21st Century “Concept Theory and Practice”. *Princess of Naradhiwas University Journal of Humanities and Social Sciences*, 7(2), 227-246. <https://so05.tci-thaijo.org/index.php/pnuhuso/article/download/240095/166494>
- Chomthong, C. (2025). Digital learning management in small schools. *Journal of Buddhist Sociology*, 10(3), 132-143. <https://so06.tci-thaijo.org/index.php/BSJ/article/view/284344>
- Daft, R. L. (2008). *The leadership experience* (4th ed.). Thomson South-Western.
- Engida, M. A., Iyasu, A. S., & Fentie, Y. M. (2024). Impact of teaching quality on student achievement: Student evidence. *Frontiers in Education*, 9, Article 1367317. <https://doi.org/10.3389/feduc.2024.1367317>

- Erdem, C., & Koçyiğit, M. (2025). The interplay among school climate, instructional quality and teacher job satisfaction: Mediation of teacher motivation. *International Journal of Educational Development*, 114, 103231. <https://doi.org/10.1016/j.ijedudev.2025.103231>.
- Ferede, B., Elen, J., Petegem, W. E., & Hunde, A. (2022). A structural equation model for determinants of instructors' educational ICT use in higher education in developing countries: Evidence from Ethiopia. *Computers & Education*, 188, 104566. <https://doi.org/10.1016/j.compedu.2022.104566>
- Fraser, B. J. (2012). Classroom learning environments: Retrospect, context, and prospect. In B. J. Fraser, K. Tobin, & C. McRobbie (Eds.), *Second international handbook of science education* (pp. 1191-1239). Springer. [https://doi.org/10.1007/978-1-4020-9041-7\\_79](https://doi.org/10.1007/978-1-4020-9041-7_79)
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2-24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hatlevik, O. E., Guðmundsdóttir, G. B., & Loi, M. (2015). Examining factors predicting students' digital competence. *Journal of Information Technology Education: Research*, 14, 123-137. <https://doi.org/10.28945/2126>
- Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: Updated guidelines. *Industrial Management & Data Systems*, 116(1), 2-20. <https://doi.org/10.1108/IMDS-09-2015-0382>
- Intarapoo, A., & Wannapiroon, P. (2021). Intelligent digital learning environment for enhancing teaching professional experience. *Technology Education Journal, King Mongkut's University of Technology North Bangkok*, 12(1), 193-204. <http://journal.fte.kmutnb.ac.th/download/v12n1/21.pdf>
- Khudadad, N., & Mickelson, R. A. (2021). School built environment, gender, and student achievement in Pakistan. *International Journal of Educational Development*, 87, 102503. <https://doi.org/10.1016/j.ijedudev.2021.102503>

- Lowpasee, T., & Sangloetuthai, J. (2017). Organizational Culture Affecting Competency of Knowledge Standards Teacher in School of Nakhonpathom Primary Educational Service Area Office 1. *Silpakorn University Educational Research Journal*, 9(1), 286-298. <https://so05.tci-thaijo.org/index.php/suedureasearchjournal/article/view/43780>
- Noipoung, K. (2024). The role of digital teachers for learning development. *Patanasilpa Journal*, 8(2), 52-71. <https://so05.tci-thaijo.org/index.php/Patanasilpa/article/view/271470>
- Ngao, A. I. (2025). A structural equation modeling of pre-service teachers' attitudes toward the use of digital technologies: A survey study in Tanzania. *Cogent Education*, 12(1), 2543130. <https://doi.org/10.1080/2331186X.2025.2543130>
- Office of the Basic Education Commission. (2025). *Policy and focal priorities of the Office of the Basic Education Commission for the fiscal years 2026-2027* [In Thai]. <https://www.sesact.go.th/index.php/39484>
- Office of the Education Council. (2017). *National Education Plan B.E. 2560-2579 (2017-2036)* [In Thai]. Prikwarn Graphic.
- Paetsch, J., Franz, S., & Wolter, I. (2023). Changes in early career teachers' technology use for teaching: The roles of teacher self-efficacy, ICT literacy, and experience during COVID-19 school closure. *Teaching and Teacher Education*, 135, 104318. <https://doi.org/10.1016/j.tate.2023.104318>
- Phantharakphong, P., & Liyanage, I. (2026). The Professional Development (PD) Paradox: How Policy Shapes English Teacher Identity and Constrains Authentic Learning in Thailand. *Education Sciences*, 16(1), 117. <https://doi.org/10.3390/educsci16010117>
- Raave, D. K., Saks, K., Pedaste, M., & Roldan Roa, E. (2024). How and Why Teachers Use Technology: Distinct Integration Practices in K-12 Education. *Education Sciences*, 14(12), 1301. <https://doi.org/10.3390/educsci14121301>
- Rasdiana, R., Mauludin, I., Yahya, A., Putri, D. E., Machrus, M. A., Marbun, M., Sholikhah, A. M., Sinusi, N. S., Fathonah, S., Salmayda, S., Pawartani, T., & Ridwan, A. (2024). Mediation of digital literacy in investigating the effect of school culture on teacher performance: Implication for educational policy. *Journal of Infrastructure Policy and Development*, 8(12), 9117. <https://doi.org/10.24294/jipd.v8i12.9117>

- Rudin, M., Fuad, D. R. S. M., Awang, M., & Ismail, R. (2024). The effect of teacher quality on primary school students' academic achievement. *International Journal of Research and Innovation in Social Science, ICAME2401*, 1-10. <https://doi.org/10.47772/IJRISS.2024.ICAME2401>
- Sarabut, D., & Lawalee, B. (2025). Teacher development for digital era education: Enhancing teacher competencies for the 21st century. *MBU Political Science Journal (Online)*, 4(2), 39-49. <https://ojs.mbu.ac.th/index.php/MBUPJ/article/view/2996>
- Schein, E. H. (2010). *Organizational culture and leadership* (4th ed.). Jossey-Bass.
- Setyawan, F. G., Widyani, A. A. D., & Suardhika, I. N. (2022). Model of digital literacy and organizational support in determining teacher performance: An empirical study. *International Journal of Research in Business and Social Science*, 11(7), 1-10. <https://doi.org/10.20525/ijrbs.v11i7.1985>
- SmartPLS. (n.d.). *Model fit. SmartPLS Documentation*. <https://www.smartpls.com/documentation>
- Srichan, P. (2019). The study of the digital learning environment for digital literacy skill development of university students: A case study of Uttaradit Rajabhat University. *Journal of Information Science and Technology*, 3(2), 1-15. [https://so09.tci-thaijo.org/index.php/jait\\_ssru/article/download/887/363/3583](https://so09.tci-thaijo.org/index.php/jait_ssru/article/download/887/363/3583)
- Sudngulueam, T. (2025). Educational organizational culture in age of digital disruption. *Journal of Interdisciplinary in Social Sciences and Education*, 1(5), 58-72. <https://so09.tci-thaijo.org/index.php/JISSE/article/view/6106>
- Tableman, B. (2004). School climate and learning. *Best Practice Briefs*, (31), 1-10.
- Terrell Shockley, E., Wall, A., & Pettit, S. K. (2024). Curriculum, instruction, and assessment in middle level teacher development: A research synthesis. *Education Sciences*, 14(11), 1168. <https://doi.org/10.3390/educsci14111168>
- Thadasirithanasakoon, S. (2024). *The causal model of factors influencing teachers' learning management in schools under the secondary education service area of Nakhon Pathom*. [Master's thesis, Silpakorn University]. <http://ithesis-ir.su.ac.th/dspace/bitstream/123456789/5689/1/650620101.pdf>

- Thammaprateep, J. (2016). Developing Technological Pedagogical Content Knowledge in Science teaching. *Journal of Research and Curriculum Development*, 6(2), 1-13. <https://so03.tci-thaijo.org/index.php/jrcd/article/view/93173>
- Tony, K. (2019). Strategies to improve education quality through facilities and infrastructure management in Singkawang vocational schools. *Teaching and Learning*, 4(2), 296-299. <https://doi.org/10.26737/jetl.v4i2.1695>
- Triyakhan, S., & Suvannagoot, R. (2022). States, problems and guidelines for developing teachers' learning management in the digital age under the Nakhon Phanom Primary Educational Service Office Area 1. *Journal of MCU Ubon Review*, 7(3), 932-943. <https://so06.tci-thaijo.org/index.php/mcjou/article/view/261386>
- Wan Ng. (2012). Can we teach digital natives digital literacy? *Computers & Education*, 59(3), 1065-1078. <https://doi.org/10.1016/j.compedu.2012.04.016>
- Yetiş, E. (2025). The relationship between motivation to teach, school climate, and attitude toward the teaching profession. *International Journal of Contemporary Educational Research*, 12(1), 123-133. <https://doi.org/10.52380/ijcer.2025.12.1.800>