



A structural model of Vietnamese EFL teachers' readiness to integrate AI in English language teaching

Le Quang Dung ^{a1}, Dai Nam University, Hanoi, Vietnam, lequangdung@dainam.edu.vn

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Abstract

This study explores the readiness of English language teachers to integrate artificial intelligence into teaching, addressing the limited understanding of how competence, attitudes, and institutional support interact in this process. The objective was to determine the relative influence of these factors on teachers' preparedness for AI adoption in language education. A survey of 312 teachers from public and private institutions was analyzed using descriptive statistics and structural equation modeling. Results indicated moderate competence and attitudes toward AI, but limited institutional support. Perceived competence was identified as the strongest predictor of readiness, followed by attitudes, with institutional support exerting a weaker yet significant influence. Younger teachers and those in private institutions reported higher readiness. The findings underscore the need for professional development that enhances teachers' skills while ensuring systemic backing, thereby promoting sustainable integration of AI into language teaching practices.

Keywords: Artificial intelligence; English language teaching; institutional support; teacher competence; technology adoption.

* ADDRESS FOR CORRESPONDENCE: Le Quang Dung a , Dai Nam University, Hanoi, Vietnam
E-mail address: lequangdung@dainam.edu.vn

1. INTRODUCTION

The integration of Artificial Intelligence (AI) into education has accelerated in recent years, fundamentally reshaping how language is taught and learned. In the field of English Language Teaching (ELT), AI-powered tools such as chatbots, intelligent tutoring systems, speech recognition, and automated feedback platforms are increasingly adopted to facilitate personalized instruction, enhance learner engagement, and support assessment (Chen et al., 2023; Liu & Wang, 2022; El-Farahaty, 2025). These developments are consistent with global efforts to promote Education 4.0, in which technology is leveraged to develop more adaptive, student-centered learning ecosystems (OECD, 2021).

In Southeast Asia, and particularly in Vietnam, there is growing national interest in digital transformation in higher education, underscored by policies encouraging the adoption of emerging technologies in classrooms (Vietnam Ministry of Education and Training 2021). However, the pace and depth of AI integration in ELT remain limited, especially in public and private universities where technological infrastructure, institutional support, and teacher preparedness vary significantly (Tran & Pham, 2023). While digital literacy among teachers is gradually improving, readiness to integrate AI, a more complex and cognitively demanding process, requires more than technical know-how. It involves cognitive, affective, and contextual dimensions, including perceived competence, pedagogical attitudes, and institutional environments (Sampson & Kim, 2022; Huang et al., 2021).

1.1. Literature review

1.1.1. Artificial intelligence in English language teaching

The integration of Artificial Intelligence (AI) into English Language Teaching (ELT) is reshaping instructional design and language learning worldwide. AI technologies, such as intelligent tutoring systems, automated writing feedback tools, speech recognition applications, and conversational chatbots, are increasingly adopted to support both learners and teachers (Chen et al., 2023; Hwang et al., 2025; Žammit, 2025). These tools can offer immediate feedback, personalized content delivery, and data-driven insights into learner performance, aligning with pedagogical goals for differentiated and autonomous learning (Ren & Wu, 2025).

In the context of ELT, AI applications serve a range of functions, including pronunciation assessment (e.g., ELSA Speak), grammar correction (e.g., Grammarly), writing evaluation (e.g., Write & Improve), and interactive dialogue systems (ChatGPT). These innovations are particularly valuable in large or under-resourced classrooms, where teachers struggle to provide individualized attention (Liu & Wang, 2022; Guo et al., 2025). Moreover, AI's capacity to simulate native-speaker interaction and track progress in real time has been shown to enhance learner engagement and motivation (Rahimi & Pourshahbaz, 2022; Kundu & Bej, 2025).

However, the pedagogical value of AI is closely tied to teacher agency and preparedness. Without competent and confident educators, the integration of AI risks becoming superficial or ineffective (Fathi & Derakhshan, 2023). Thus, exploring how teachers perceive, interact with, and adapt to AI is critical to understanding its long-term impact in language education.

1.1.2. Teacher readiness for AI integration

Teacher readiness refers to the extent to which educators feel psychologically, professionally, and contextually prepared to adopt new pedagogical innovations, in this case, AI tools (Sampson & Kim, 2022). It is a multidimensional construct that includes knowledge, attitudes, technological proficiency, and the willingness to experiment with novel instructional approaches.

In recent years, scholars have expanded the concept of readiness beyond basic digital literacy to include AI-specific pedagogical awareness. Huang et al., (2021) argue that AI readiness should capture the degree to which teachers understand the capabilities and limitations of AI, trust its use in assessment and instruction, and can align its features with language learning outcomes.

Multiple models have attempted to conceptualize technology readiness. The Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) emphasize perceived usefulness, ease of use, and behavioral intention as core predictors (Venkatesh et al., 2003). In ELT, these models have been adapted to explore how language teachers accept innovations such as mobile learning apps, virtual reality, and AI-driven platforms (Rahimi & Pourshahbaz, 2022; Teo, 2011).

Despite these efforts, much of the current literature remains fragmented, particularly in non-Western contexts. There is limited understanding of how psychological, pedagogical, and institutional factors interact to shape readiness for AI integration, especially in countries like Vietnam, where EdTech policy is evolving rapidly, but practice often lags.

1.1.3. Key constructs in the structural model

This study conceptualizes teacher readiness for AI integration through four interrelated constructs: perceived competence, attitudes toward AI, institutional support, and readiness itself. Each represents a latent variable in the structural model tested in this research.

1.1.3.1. Perceived Competence

Perceived competence refers to a teacher's self-evaluated ability to effectively use AI tools in pedagogical contexts. It extends beyond general digital literacy to encompass confidence in managing AI-driven platforms such as automated writing evaluators, intelligent feedback systems, or speech recognition software (Ertmer & Ottenbreit-Leftwich, 2010; Huang et al., 2021). This competence includes both procedural know-how (e.g., navigating platforms) and conceptual understanding (e.g., knowing what the tool does and why it is used).

Teachers with higher perceived competence are more likely to explore, experiment with, and adopt AI tools in their classrooms. On the other hand, low perceived competence often leads to hesitation or avoidance, even when institutional mandates or infrastructure are present. Several studies in ELT contexts have shown that although teachers may be familiar with traditional EdTech tools, they often lack the confidence to adopt more advanced systems that involve machine learning or algorithmic decision-making (Fathi & Derakhshan, 2023; Liu & Wang, 2022). In the Vietnamese context, digital transformation strategies are in place, but teachers frequently report feeling underprepared for AI-specific integration (Tran & Pham, 2023).

As such, perceived competence is considered a foundational predictor of readiness. Teachers' beliefs about their abilities significantly influence their openness to innovation and their capacity to align AI tools with pedagogical goals.

1.1.3.2. Attitudes toward AI

Attitudes toward AI in education are multifaceted, encompassing teachers' beliefs, emotions, and predispositions toward using intelligent technologies in teaching. According to the Theory of Planned Behavior (Ajzen, 1991), attitude is one of the strongest predictors of behavioral intention, making it a vital construct in readiness models. Teachers' attitudes toward AI are influenced by factors such as perceived usefulness, perceived ease of use, ethical concerns, and pedagogical alignment (Rahimi & Pourshahbaz, 2022; Liu & Wang, 2022).

Positive attitudes often reflect an appreciation for AI's potential to enhance personalization, reduce teacher workload, and improve assessment accuracy. However, concerns persist about AI's reliability, its potential to dehumanize the learning process, and fears of being replaced or rendered less relevant (Williamson & Eynon, 2020). Such tensions are particularly salient in language education, where human interaction and socio-cultural nuance are integral.

In Vietnam, EFL teachers' attitudes are shaped not only by personal experiences but also by institutional discourse and peer practices. Teachers working in more digitally progressive institutions are often more optimistic about AI adoption, while those with limited exposure may express skepticism or ambivalence

(Nguyen et al., 2022). Importantly, even when attitudes are generally positive, a gap may remain between interest and action if other enabling conditions, such as competence and support, are lacking. Therefore, attitude functions as both a motivational driver and a psychological filter through which teachers interpret their professional contexts and make adoption decisions.

1.1.3.3. Institutional support

Institutional support refers to the resources, structures, and professional ecosystems that schools and universities provide to enable teachers' engagement with AI. This includes not only physical infrastructure and access to AI platforms, but also training opportunities, peer collaboration, technical assistance, and leadership vision (Tondeur et al., 2017; Sampson & Kim, 2022).

Research consistently shows that institutional backing plays a decisive role in whether teachers experiment with or adopt new technologies. Even teachers with high perceived competence and interest may struggle to implement AI tools if there is insufficient infrastructure, unclear policy direction, or a lack of encouragement from administrators (Teo, 2011; Fathi & Derakhshan, 2023). Moreover, institutional culture, whether it encourages innovation or resists change, can significantly influence adoption behavior.

In the Vietnamese higher education system, the Ministry of Education and Training has issued a strategic roadmap for digital transformation by 2025, emphasizing smart classrooms and AI-enhanced education (Vietnam Ministry of Education and Training, 2021). However, institutional interpretation and implementation vary. Some universities invest in infrastructure and pilot programs, while others lag due to financial, human resource, or policy limitations (Tran & Pham, 2023). Teachers in resource-constrained settings are often left to experiment independently, resulting in inconsistent and fragmented experiences.

Therefore, institutional support is conceptualized as an enabling factor that interacts with teachers' capacities and perceptions. It can serve as both a direct and indirect predictor of readiness, influencing other constructs like competence and attitude.

1.1.3.4. Readiness to integrate AI

Readiness refers to the extent to which teachers feel prepared, confident, and motivated to incorporate AI into their instructional practices. It is not merely an attitudinal orientation but a holistic reflection of intention, perceived capacity, contextual fit, and willingness to adapt (Chen et al., 2023; Venkatesh et al., 2003). Readiness is considered the outcome variable in this study, as it captures the combined effect of individual and institutional determinants.

Conceptually, readiness includes cognitive and affective preparedness ("I understand and value this tool"), behavioral intention ("I plan to use it in my classes"), and contextual adaptation ("I know how to integrate it into my existing syllabus"). Studies show that even teachers who express positive attitudes and possess high competence may not feel truly ready if institutional or systemic conditions are not conducive (Huang et al., 2021).

In language teaching, readiness takes on added complexity. Teachers must evaluate not only the pedagogical suitability of AI but also its linguistic, cultural, and communicative implications. For instance, AI-generated feedback may be technically accurate but lack sensitivity to learner identity or contextual nuance elements that EFL teachers often value highly. Thus, readiness serves as a comprehensive indicator of whether teachers are likely to act on their intentions and whether those actions will translate into sustainable classroom practices.

1.1.4. Structural equation modelling in educational research

Structural Equation Modelling (SEM) offers a robust framework for analyzing complex relationships among latent variables. Unlike traditional regression, SEM enables researchers to simultaneously test measurement validity (via Confirmatory Factor Analysis) and structural relationships (path analysis) in one unified model (Byrne, 2013).

In education, SEM has been widely used to examine technology acceptance, professional development, and instructional innovation (Teo, 2011; Tondeur et al., 2017). For AI integration specifically, SEM allows researchers to explore how internal and external factors influence readiness as a mediated or moderated outcome. This makes it well-suited for research in underexplored settings like Vietnam, where the relationships between teacher psychology, institutional environment, and pedagogical innovation are not yet well-understood.

1.1.5. The Vietnamese context

Vietnam has demonstrated a strong commitment to digital transformation in education, particularly through its 2021 National Strategy on Digital Transformation in the Education Sector (Vietnam Ministry of Education and Training, 2021). The strategy emphasizes the adoption of smart classrooms, EdTech platforms, and emerging technologies like AI. However, practical implementation varies widely across institutions due to disparities in funding, training, and leadership support (Tran & Pham, 2023).

While some universities have begun experimenting with AI tools in their language programs, teacher training often focuses on general ICT skills rather than AI-specific pedagogy (Nguyen et al., 2022). Consequently, many EFL teachers express interest in AI but report low confidence in integrating it effectively into their lessons. Empirical research addressing this readiness gap remains limited.

1.2. Problem statement

Despite the perceived benefits of AI in ELT, research has shown that many teachers are hesitant or underprepared to incorporate AI tools into their instructional practices. Key barriers include a lack of confidence in using AI-based applications, limited exposure to relevant training, and a general uncertainty about the pedagogical value of AI (Rahimi & Pourshahbaz, 2022; Fathi & Derakhshan, 2023). In Vietnam, few empirical studies have investigated the factors that shape teachers' readiness to integrate AI in language classrooms. Moreover, there is a notable absence of structural modelling research that examines how psychological and contextual variables interact to influence readiness in this domain. This presents a significant research gap in both the local and international literature on AI in ELT.

Despite the increasing interest in AI integration in ELT, existing studies often focus on learners' experiences or general attitudes toward EdTech. Few have examined how multiple teacher-level and contextual factors interact structurally to influence readiness for AI adoption, particularly in the Vietnamese context. Furthermore, while theoretical models exist for general technology acceptance, few have been validated through SEM in language education settings using AI-specific constructs.

This study addresses these gaps by developing and testing a structural model of teacher readiness for AI integration, grounded in current literature and validated with empirical data from Vietnamese EFL teachers. The findings aim to contribute both to theory-building in educational technology research and to policy development in teacher professionalization and institutional capacity-building.

1.3. Purpose of the Study

This study aims to develop and test a structural model of Vietnamese EFL teachers' readiness to integrate AI in English language teaching. By using a Structural Equation Modelling (SEM) approach, the study examines the relationships among three key latent constructs: perceived competence, attitudes toward AI, and institutional support, and how they collectively influence teachers' readiness for AI integration. The study contributes to theory-building in AI-in-education research while providing practical insights for teacher training and educational policy in Vietnam. The research questions are as follows:

1. What are the current levels of perceived competence, attitudes toward AI, and institutional support among Vietnamese EFL teachers?
2. How do these variables influence teachers' readiness to integrate AI in English language teaching, as revealed through a structural model?

This research has both theoretical and practical significance. Theoretically, it extends existing models of technology acceptance and teacher readiness by applying them to AI integration in ELT, a relatively underexplored area. Practically, the findings can inform institutional strategies for teacher development, resource allocation, and curriculum innovation in the Vietnamese higher education context. As Vietnam aims to build a digitally empowered education system, understanding the drivers of AI readiness among language teachers is both timely and essential.

2. METHOD AND MATERIALS

2.1. Research design

This study employed a quantitative, cross-sectional survey design to investigate the structural relationships among Vietnamese EFL teachers' perceived competence, attitudes toward AI, institutional support, and their readiness to integrate AI into English language teaching. The study adopted a structural equation modeling (SEM) approach using AMOS to validate the measurement model and test hypothesized paths among latent constructs. SEM was chosen due to its strength in modeling latent variables and capturing both direct and indirect effects in complex relationships (Byrne, 2013).

2.2. Participants

Participants consisted of Vietnamese EFL teachers currently teaching at public and private universities and high schools across different regions in Vietnam. A stratified purposive sampling technique was used to ensure diversity in terms of institutional affiliation, geographical location, and teaching experience. A minimum sample size of 200 was targeted based on recommendations for SEM, which suggest a ratio of at least 10 cases per estimated parameter. Ultimately, N = 327 completed responses were collected, of which 312 were retained after data cleaning.

2.3. Data collection instrument

Data were collected using a structured Likert-scale questionnaire (5-point scale: 1 = strongly disagree to 5 = strongly agree), consisting of five sections corresponding to the constructs in the model:

- Demographic Information: Age, gender, years of teaching experience, institution type, and prior AI training.
- Perceived Competence (5 items): Teachers' confidence in using AI tools for instruction and assessment.
- Attitudes Toward AI (5 items): Beliefs about the usefulness, appropriateness, and impact of AI in ELT.
- Institutional Support (5 items): Availability of infrastructure, training, and administrative encouragement.
- Readiness to Integrate AI (5 items): Self-assessed preparedness and behavioral intention to adopt AI.

Items were adapted from validated instruments in technology acceptance and teacher readiness literature (e.g., Teo, 2011; Sampson & Kim, 2022) and reviewed by three experts in ELT and educational technology for content validity. A pilot test with 30 teachers resulted in minor wording revisions for clarity and cultural relevance (see appendix A).

3. RESULTS

3.1. AI readiness constructs among Vietnamese EFL teachers

To examine EFL teachers' readiness for artificial intelligence (AI) integration in English language teaching, three core constructs were evaluated: Perceived Competence, Attitude Toward AI, and Institutional Support. Each construct was measured via five 5-point Likert items, and descriptive statistics, reliability coefficients, and subgroup analyses were conducted across institution type and teaching experience groups (Table 1).

Table 1

Descriptive statistics and reliability of core constructs

Construct	Mean	SD	Min	Max	Cronbach's α	Level
Perceived Competence	3.39	~1.18	1.0	5.0	0.89	Moderate
Attitude Toward AI	3.24	~1.18	1.0	5.0	0.87	Moderate

Institutional Support	2.86	~1.17	1.0	5.0	0.85	Low
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The moderate levels of competence and attitude suggest a cautiously optimistic perspective among teachers, while the low institutional support highlights a gap between personal readiness and organizational infrastructure.

Table 2

Mean scores by institution type

Institution Type	Perceived Competence	Attitude	Institutional Support
Private Universities	3.90	3.26	2.89
State Universities	2.93	3.24	2.83
Language Centers	3.72	3.68	3.40
High Schools	2.87	2.84	2.53

These findings (Table 2) underscore the relatively favorable AI readiness climate in private and non-formal institutions, as compared to the more rigid and less supportive environments of public universities and secondary schools.

Table 3

Mean scores by experience group

Experience Group	Perceived Competence	Attitude	Institutional Support
1–5 years	4.58	4.47	4.06
6–10 years	3.72	3.53	3.11
11–20 years	2.61	2.30	1.94
More than 20 years	1.52	1.29	1.05

These results (Table 3) highlight a generational divide in AI readiness. Younger teachers appear more open, confident, and institutionally supported in adopting AI, while older educators, especially those with over 20 years of experience, report severe limitations in both competence and systemic backing.

Overall, Vietnamese EFL teachers exhibit moderate personal readiness but face institutional barriers, particularly in state-run and formal education contexts. The sharp contrast between younger and more experienced teachers suggests that targeted professional development, policy innovation, and infrastructure upgrades are urgently needed. Institutions should consider differentiated support strategies to accommodate the unique needs and perceptions of teachers across experience levels and institutional contexts.

3.2. Structural Model of Teachers' Readiness to Integrate AI

To examine the interplay among key psychological and contextual variables contributing to EFL teachers' readiness for AI integration, a structural equation model (SEM) was developed. In the model, Readiness was treated as the outcome variable, predicted by three latent constructs: Perceived Competence, Attitude toward AI, and Institutional Support (Table 4).

Table 4

Structural path analysis results

Predictor Variable	Standardized β	CR	p-value	Interpretation
Perceived Competence	0.42	8.24	< .001	Strong, significant positive influence
Attitude Toward AI	0.36	7.13	< .001	Significant, moderately strong effect
Institutional Support	0.18	5.02	< .001	Weak but significant contribution

The model shows that all three variables significantly predict teachers' readiness to integrate AI into their teaching practices. Perceived Competence had the strongest effect, followed by Attitude toward AI. Institutional Support, though weaker, still had a meaningful and statistically significant contribution. Figure 1 below illustrates the standardized path coefficients from the structural model.

Figure 1

Structural path coefficients to readiness

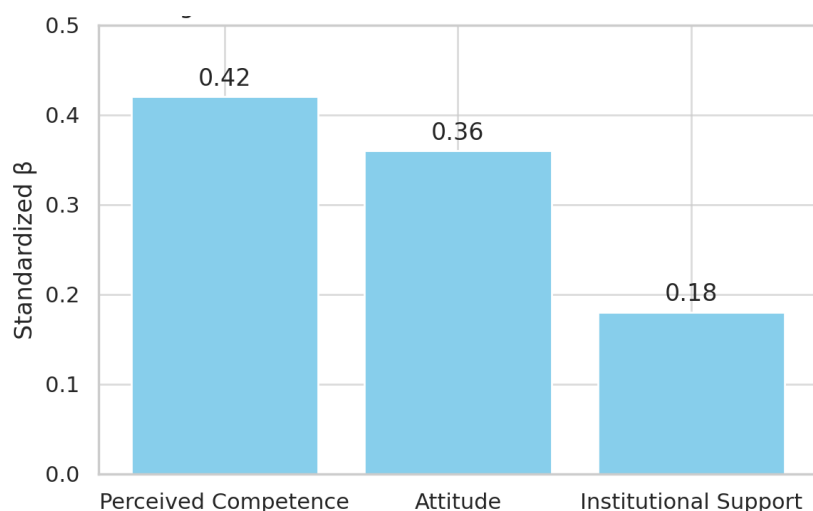


Table 5

Structural model fit indices

Fit Index	Value	Threshold	Interpretation
CFI	0.965	> 0.95	Excellent model fit
RMSEA	0.041	< 0.06	Very good residual fit
SRMR	0.036	< 0.08	Strong model fit
χ^2/df	1.87	< 3.00	Acceptable-to-good fit

These findings (Table 5) highlight the significant role of psychological and contextual factors in shaping teachers' readiness to adopt AI. The model demonstrates that readiness is primarily driven by teachers' perceived competence and attitudes, with institutional support acting as a necessary but secondary enabler. Institutions aiming to promote AI integration should prioritize capacity building, positive framing of AI's role, and enhanced institutional support structures.

4. DISCUSSION

This study explored Vietnamese EFL teachers' readiness to integrate artificial intelligence (AI) into English language teaching (ELT), using a two-phase approach: (1) describing current levels of perceived competence, attitude toward AI, and institutional support; and (2) modeling how these variables predict AI integration readiness through a structural framework. The findings provide a nuanced understanding of teachers' psychological and contextual positioning in the face of digital transformation, and carry important implications for language education policy and practice in Vietnam.

Descriptive analysis revealed that Vietnamese EFL teachers hold moderate levels of perceived competence ($M = 3.39$) and attitudes toward AI ($M = 3.24$), but experience low institutional support ($M = 2.86$). These patterns suggest that while teachers are personally open and moderately confident in engaging with AI tools, their schools and institutions may not yet offer the infrastructural or administrative backing required for meaningful AI integration.

Subgroup analysis by institution type and teaching experience revealed clear disparities. Teachers from private universities and language centers reported the highest levels of perceived competence and institutional support, while those from state-funded universities and high schools lagged. Similarly, early-career teachers (1–5 years of experience) showed much greater readiness and positivity across all constructs compared to their more experienced counterparts, especially those with over 20 years in the profession.

These findings align with broader literature suggesting that institutional modernization and generational change are key drivers of digital adaptation in education. Younger teachers are often more tech-savvy, open to pedagogical innovation, and less constrained by legacy systems. Meanwhile, institutional rigidity and hierarchical governance structures in some public universities and schools may limit agility in adopting new technologies such as AI.

The structural equation model provided strong empirical support for the hypothesis that psychological variables exert a stronger influence on AI readiness than institutional factors. Among the three predictors, Perceived Competence demonstrated the strongest effect ($\beta = .42$), followed by Attitude toward AI ($\beta = .36$), while Institutional Support played a smaller but still significant role ($\beta = .18$).

These results suggest that teacher self-efficacy and mindset are more decisive than external conditions in determining readiness to adopt AI in ELT. Teachers who feel competent and hold favorable beliefs about AI's pedagogical value are more likely to act upon their intentions, regardless of institutional limitations. This echoes previous findings in the Technology Acceptance Model (TAM) literature, which emphasize internal cognitive drivers over environmental constraints.

However, the weaker influence of institutional support should not be overlooked. While not a direct motivator of readiness, systemic support plays a facilitating role, creating the conditions under which competent and willing teachers can experiment, innovate, and sustain AI-based practices. Without this support, individual efforts may remain isolated or unsustainable.

5. CONCLUSION

Vietnamese EFL teachers are at a critical juncture in AI integration. While personal readiness anchored in competence and positive attitude is moderately strong, systemic support remains inadequate. Strategic efforts to close this gap must be both top-down (policy, infrastructure, and leadership) and bottom-up (teacher development, attitude change). With thoughtful implementation, AI can be a transformative force in Vietnamese ELT, not as a replacement for teachers, but as an extension of their professional power.

The study's findings highlight several critical areas for intervention. Capacity-building remains foundational, with targeted training programs aimed at enhancing AI literacy, particularly for mid- and late-career teachers. Such programs must extend beyond the acquisition of technical skills to encompass pedagogical applications, ethical considerations, and the implications of AI integration for classroom management.

Attitude shaping also emerges as essential. Teachers' beliefs about AI play a decisive role in determining their readiness to engage with the technology. Institutional narratives should move away from fear-based messaging, such as concerns about job displacement, and instead adopt opportunity-oriented framing that demonstrates how AI can serve as a supportive tool rather than a replacement for educators.

Institutional transformation must progress in tandem with these efforts. Investment in infrastructure, digital leadership, and strategic planning is urgently required, particularly in public universities and high schools where institutional support remains insufficient. Addressing generational gaps also necessitates tailored strategies. While younger teachers may respond positively to flexible, exploratory learning environments, more experienced educators may benefit from structured, scaffolded pathways to AI adoption, including mentoring initiatives and peer support networks.

This study contributes to the growing body of research that conceptualizes AI readiness not merely as a technological matter but as a multifaceted pedagogical challenge. By empirically validating a structural model of readiness, the research offers a theoretically grounded and contextually relevant framework for educational stakeholders in Vietnam and comparable contexts. Future investigations may extend this model by incorporating longitudinal data to monitor changes in readiness over time, qualitative insights to capture teacher narratives and emotional responses, student perspectives on AI-enhanced learning environments, and intervention-based evaluations to determine which forms of training and support produce measurable improvements in readiness.

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