FACTORS INFLUENCING THAI EFL TEACHERS' INTEGRATION OF DIGITAL TECHNOLOGY IN ENGLISH LANGUAGE TEACHING

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Received Date: March 19, 2026 ; Revised Date: April 3, 2026 ; Accepted Date: April 7, 2026

Abstract

This mixed methods study aimed to (1) examine the current state of digital technology integration among Thai EFL teachers in primary schools under the Bangkok Metropolitan Administration (BMA), (2) identify and analyze factors influencing technology integration, (3) investigate the predictive power of these factors, and (4) explore teachers' perceptions and lived experiences regarding barriers and facilitators of technology integration. The participants consisted of 400 English language teachers selected through stratified random sampling from 50 BMA primary schools. Quantitative data were collected using a validated questionnaire based on the Technology Acceptance Model (TAM) and related digital competence constructs, while qualitative data were gathered through semi-structured interviews with 20 purposively selected participants. Quantitative data were analyzed using descriptive statistics, Pearson correlation, and multiple regression analysis, whereas qualitative data were analyzed through thematic analysis.

In relation to the research objectives, the findings can be summarized as follows :

First, the current state of digital technology integration among Thai EFL teachers in BMA primary schools was at a moderate level, with most teachers operating at the infusion and integration stages. Second, key factors influencing technology integration included digital competence, perceived usefulness, institutional support, and student motivation. Third, the predictive analysis demonstrated that these factors significantly contributed to technology integration, with digital competence being the strongest predictor, and the model explaining 61.3% of the variance. Finally, qualitative findings revealed that while teachers recognized the pedagogical value of digital technology, they faced challenges related to infrastructure, training, and time constraints, whereas professional learning communities and leadership support acted as important facilitating conditions.

Keywords: Digital Technology Integration, Thai EFL Teachers, Primary Education, TAM, Bangkok Metropolitan Administration

Background and significance of the problem

The rapid advancement of digital technology has fundamentally transformed educational paradigms worldwide, compelling educators to adapt their pedagogical practices to meet the demands of 21st-century learners (UNESCO, 2023). In the context of English as a Foreign Language (EFL) teaching, digital technology offers unprecedented opportunities to enhance language learning through authentic, interactive, and multimodal experiences (Chun, et al., 2016; Golonka, et al., 2014). However, despite the widespread availability of digital tools, research consistently indicates significant gaps between technology availability and actual classroom integration, particularly in developing country contexts (Ertmer and Ottenbreit-Leftwich, 2010).

Thailand's educational system has prioritized digital transformation as a national agenda through various policy frameworks, including the Thailand 4.0 initiative and the National Education Plan 2017–2036 (Office of the Education Council, 2017). The Bangkok Metropolitan Administration

(BMA) has invested substantially in providing technological infrastructure to its primary schools, yet systematic investigations into factors affecting teachers' actual utilization of these resources remain limited. Understanding the complex interplay of individual, institutional, and contextual factors that influence technology integration is essential for developing evidence-based interventions that can bridge the gap between policy aspirations and classroom realities.

Previous research has employed various theoretical frameworks to understand technology integration, with the Technology Acceptance Model (TAM) (Davis, 1989) and the Technological Pedagogical Content Knowledge (TPACK) framework (Mishra and Koehler, 2006) emerging as the most widely applied. While these frameworks have yielded valuable insights in Western and East Asian contexts, their applicability and explanatory power within the Thai educational context—characterized by distinct cultural values, hierarchical institutional structures, and unique pedagogical traditions—warrant systematic investigation. This study addresses this gap by conducting a comprehensive mixed methods investigation into factors influencing technology integration among EFL teachers in BMA primary schools. By combining quantitative survey data from 400 teachers with qualitative insights from 20 in-depth interviews, the study aims to provide both statistically robust findings and rich contextual understanding of the phenomenon. Specifically, the study aims to identify key predictors and examine how these factors interact to influence digital technology integration in EFL classrooms.

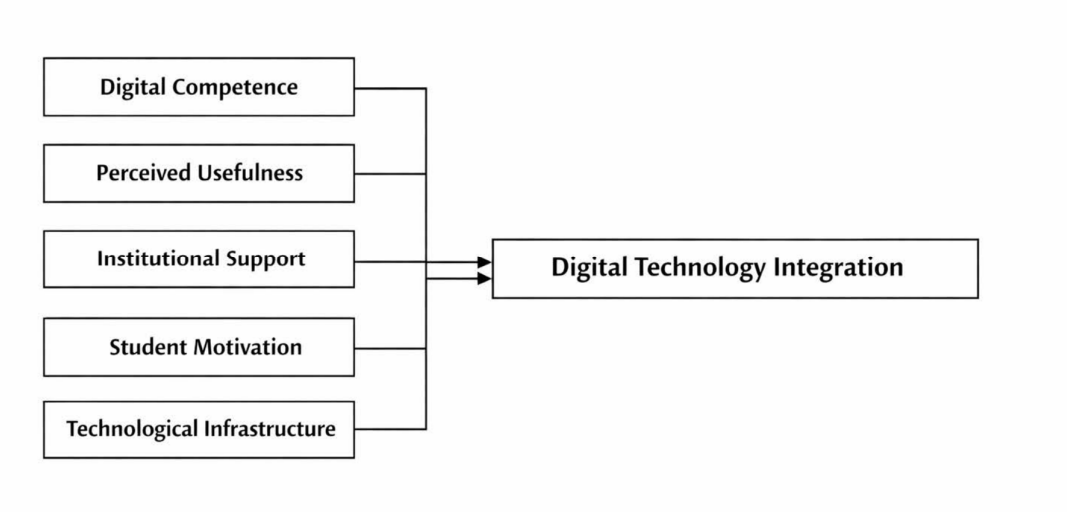
Research objectives

1. To examine the current state of digital technology integration among Thai EFL teachers in BMA primary schools.
2. To identify and analyze factors influencing technology integration.
3. To investigate the predictive power of identified factors on technology integration.
4. To explore teachers' perceptions and lived experiences regarding technology integration barriers and facilitators.

Conceptual Framework

The conceptual framework of this study was adapted from selected constructs of the Technology Acceptance Model (TAM) and digital competence framework, focusing on key variables that have been empirically validated in prior research. To ensure parsimony and alignment with the research design, only five core predictors were included in the final model: digital competence, perceived usefulness, institutional support, student motivation, and technological infrastructure. These variables were hypothesized to directly influence digital technology integration, which was treated as the dependent variable.

Figure 1: Conceptual Framework for Thai EFL Teachers' Digital Technology Integration



Research Hypothesis

Based on the conceptual framework, digital technology integration was treated as the dependent variable, while individual-, institutional-, and learner-level factors were considered independent variables.

H1: Digital competence positively predicts digital technology integration.

H2: Perceived usefulness positively predicts digital technology integration.

H3: Institutional support positively predicts digital technology integration.

H4: Student motivation positively predicts digital technology integration.

H5: Technological infrastructure positively predicts digital technology integration.

Research Methodology

This study adopts a mixed methods approach using a concurrent triangulation design (Creswell and Plano Clark, 2018), in which quantitative and qualitative data were collected and analyzed simultaneously to provide a comprehensive understanding of factors influencing digital technology integration among Thai EFL teachers.

Population and Sample

This study employed a concurrent triangulation mixed methods design (Creswell and Plano Clark, 2018). The target population comprised all English language teachers employed in primary schools (Prathom 1–6) under the Bangkok Metropolitan Administration (BMA) during the academic year 2023–2024, totaling approximately 2,847 teachers across 437 BMA primary schools.

For the quantitative strand, sample size was determined using Krejcie and Morgan's (1970) formula for finite populations, yielding a minimum required sample of 338 participants. A proportional stratified random sampling procedure was employed across 50 schools (approximately 9 per district across 6 administrative zones), resulting in 432 distributed questionnaires and 400 valid responses (response rate = 88.9%). For the qualitative strand, 20 participants were purposively selected from the quantitative sample to represent maximum variation in terms of teaching experience, technology integration level, school size, and district location. Maximum variation sampling was achieved by selecting participants based on their questionnaire responses. Specifically, participants were categorized into low, moderate, and high levels of technology integration (based on LoTi scores), as well as varying years of teaching experience and school contexts. Participants were then purposively selected to ensure representation across these categories.

Variables

The dependent variable was digital technology integration. The independent variables

included five key predictors derived from the conceptual framework: digital competence, perceived usefulness, institutional support, student motivation, and technological infrastructure. Variables such as perceived ease of use and pedagogical beliefs were excluded from the final regression model due to model parsimony considerations.

Research Instruments

The quantitative instrument was a validated 5-part questionnaire. Part 1 collected demographic information (6 items). Part 2 measured digital technology integration level (20 items, LoTi-based). Parts 3–7 measured independent variables: Digital Competence (15 items, DigComp 2.1), Perceived Usefulness (12 items, TAM-based). Perceived ease of use was initially measured but excluded from the final regression model to ensure model parsimony, Institutional Support (10 items), Student Motivation (8 items), and Technological Infrastructure (8 items). All items used a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The qualitative instrument consisted of a semi-structured interview protocol comprising 12 open-ended questions across four thematic areas.

Creating and evaluating the quality of tools

Content validity was established through review by a panel of five experts (three EFL specialists and two educational technology experts), yielding an Item-Objective Congruence (IOC) index ranging from .80 to 1.00 for all items. Construct validity was assessed through confirmatory factor analysis (CFA), with satisfactory model fit indices (CFI = .94, TLI = .93, RMSEA = .051, SRMR = .062). Internal consistency reliability was assessed using Cronbach's alpha, yielding coefficients ranging from .81 to .93 across all subscales. The interview protocol was piloted with three teachers not included in the main study and refined accordingly.

Data Collection

Quantitative data were collected through an online questionnaire distributed via Google Forms during October–November 2025. Research assistants visited each school to facilitate participation and address technical issues. Qualitative interviews were conducted during November–December 2025, with each interview lasting 45–60 minutes. All interviews were audio-recorded with participants' informed consent and subsequently transcribed verbatim.

Data Analysis

Quantitative data were analyzed using SPSS version 28.0, employing descriptive statistics, Pearson product-moment correlations, and simultaneous multiple regression analysis. Assumptions of linearity, normality, homoscedasticity, and multicollinearity were verified prior to analysis. Multicollinearity was assessed using Variance Inflation Factor (VIF), with values ranging from 1.42 to 2.87, indicating no multicollinearity concerns (VIF < 5). Qualitative data were analyzed using reflexive thematic analysis (Braun and Clarke, 2006, 2021). Member checking was conducted with six participants to enhance credibility. Inter-rater reliability was established through independent coding by a second researcher, achieving Cohen's kappa of .84. Ethical approval was obtained from the relevant institutional review board, and all participants provided informed consent prior to data collection.

Research Result

Current Level of Digital Technology Integration

Descriptive analysis revealed that the overall level of digital technology integration among BMA EFL teachers was at the moderate level (M = 3.12, SD = 0.74). Approximately 34.3% of teachers were classified at awareness or exploration levels (LoTi 1–2), 41.5% at infusion or integration levels (LoTi 3–4), and 24.2% at expansion or refinement levels (LoTi 5–6). No teachers were classified at the highest level (LoTi 7). The most commonly integrated technologies were presentation software (87.5%), YouTube videos (82.3%), and online dictionaries/translation tools (78.8%). Learning management systems (28.3%), collaborative tools (31.5%), and

AI-assisted tools (18.8%) showed notably lower integration rates. These findings suggest that most teachers are at a transitional stage of technology integration, with limited progression toward higher-level, transformative use of digital tools.

Correlational Analysis

Pearson correlation analysis revealed significant positive relationships between all independent variables and digital technology integration (Table 1). Digital competence showed the strongest correlation ($r = .58$, $p < .001$), followed by perceived usefulness ($r = .52$, $p < .001$), institutional support ($r = .47$, $p < .001$), student motivation ($r = .43$, $p < .001$), and technological infrastructure ($r = .38$, $p < .001$). All inter-correlations among predictors were within acceptable ranges ($r < .70$), indicating absence of multicollinearity. No multicollinearity issues were detected (VIF = 1.42–2.87).

Table 1: Pearson Correlation Coefficients Among Study Variables (N = 400)

Variable	1 Technology Integration	2 Digital Competence	3 Perceived Usefulness	4 Institutional Support	5 Student Motivation
1. Technology Integration	—				
2. Digital Competence	.58**	—			
3. Perceived Usefulness	.52**	.44**	—		
4. Institutional Support	.47**	.38**	.41**	—	
5. Student Motivation	.43**	.36**	.39**	.45**	—

Note. ** $p < .001$ (two-tailed).

Multiple Regression Analysis

A simultaneous multiple regression analysis was conducted to examine the predictive power of the five independent variables on digital technology integration. The overall model was statistically significant, $F(5, 394) = 125.43$, $p < .001$, $R^2 = .613$, adjusted $R^2 = .608$, indicating that the five predictors collectively explained 61.3% of the variance in technology integration. Table 2 presents the standardized regression coefficients and their significance levels.

Table 2: Multiple Regression Analysis: Predictors of Digital Technology Integration (N = 400)

Predictor	B	SE	β	t	p
Digital Competence	.48	.06	.42	8.23	< .001
Perceived Usefulness	.41	.07	.38	6.14	< .001
Institutional Support	.33	.06	.31	5.47	< .001
Student Motivation	.29	.08	.27	3.56	< .05
Tech. Infrastructure	.18	.07	.18	2.49	< .05

Note. $R^2 = .613$; Adjusted $R^2 = .608$; $F(5, 394) = 125.43$, $p < .001$.

B = unstandardized coefficient; SE = standard error; β = standardized coefficient.

Qualitative Findings

Thematic analysis of interview data yielded four overarching themes: (1) Technology as a Pedagogical Tool, (2) Competence and Confidence Challenges, (3) Institutional and Systemic Barriers, and (4) Pathways to

Sustainable Integration. These themes corroborated and extended the quantitative findings, providing explanatory depth.

Theme 1: Technology as a Pedagogical Tool. Participants generally recognized digital technology's potential to enhance student engagement and provide authentic language learning experiences:

> "When I use YouTube videos or online games, my students immediately become more attentive. They see English as something alive, not just words in a textbook. That changes everything." (P7, 12 years experience)

Theme 2: Competence and Confidence Challenges. Participants described a confidence gap between personal technology use and pedagogically effective integration:

> "I can use my smartphone fine, but knowing which app is really good for teaching pronunciation or grammar—that's different. I need more training specifically for teaching, not just how to use the technology." (P12, 8 years experience)

Theme 3: Institutional and Systemic Barriers. Participants consistently identified inadequate infrastructure and the pivotal role of administrative support:

> "If the school director doesn't see technology as important, it won't happen. I've seen schools with identical equipment where in one school teachers use it every day, and in another it's collecting dust. The difference is always the leadership." (P3, 18 years experience)

Theme 4: Pathways to Sustainable Integration. High-integrating teachers consistently cited professional learning communities (PLCs) as most effective for development:

> "The training workshops give you information, but then you go back to your classroom and you're alone. The PLC is different—we share lessons, we try things together, we help each other when something doesn't work." (P16, 15 years experience)

Overall, the qualitative findings clearly indicate that while teachers recognize the pedagogical value of digital technology, their actual integration is constrained by limited pedagogical training, insufficient institutional support, and infrastructural limitations. Collaborative professional learning communities emerged as a critical enabling factor for sustainable integration.

Summary of Findings Based on Research Objectives

1. The overall level of digital technology integration was moderate.

2. Digital competence, perceived usefulness, institutional support, and student motivation were significant influencing factors.

3. These variables significantly predicted technology integration, with digital competence as the strongest predictor ($R^2 = .613$).

4. Teachers perceived technology as valuable but faced barriers such as infrastructure limitations, lack of training, and time constraints, while leadership and PLCs acted as key facilitators.

Discussion of research results

The findings of this study contribute to the growing body of research on technology integration in EFL education by providing robust quantitative evidence alongside rich qualitative insights from the BMA primary school context. The regression model explaining 61.3% of variance in technology integration represents a notable improvement over previous TAM-based studies in Thai

educational contexts (Teo and Noyes, 2011; Tangkiengsirisin, 2018), suggesting that the expanded multi-factor model employed in this study captures a more comprehensive picture of the complex determinants of technology integration.

Importantly, the qualitative findings provide explanatory depth to the quantitative results. For instance, while digital competence emerged as the strongest predictor statistically, interview data revealed that this competence is not merely technical but deeply pedagogical in nature. Similarly, institutional support was shown quantitatively to be significant, but qualitative evidence highlighted the critical mediating role of school leadership in translating policy into practice. This integration of findings strengthens the explanatory power of the study.

The identification of digital competence as the strongest predictor (β = .42) aligns with findings from similar EFL contexts in Asia (Chai, et al., 2013; Scherer, et al., 2019) and underscores the fundamental importance of teachers' technological knowledge and skills as a prerequisite for meaningful technology integration. This finding is consistent with prior research emphasizing the importance of teachers integrated technological and pedagogical knowledge for effective technology integration. This finding is consistent with previous studies indicating that teachers' digital competence is a crucial determinant of successful technology integration (Scherer, et al., 2019). It highlights that beyond access to technology, teachers must possess the necessary skills and pedagogical understanding to effectively integrate digital tools into their teaching practices.

Perceived usefulness emerging as the second strongest predictor (β = .38) provides strong support for TAM's central proposition that teachers' subjective assessment of technology's value for their pedagogical goals fundamentally shapes their adoption behavior (Davis, 1989; Venkatesh and Davis, 2000). The qualitative data reveal that teachers' perceptions of usefulness are often constrained by limited awareness of the diverse affordances of available technologies for language teaching.

The significant contribution of institutional support (β = .31) corroborates Ertmer's (2005) influential distinction between first-order barriers (external, resource-based) and second-order barriers (internal, belief-based). The qualitative data compellingly illustrate how administrative leadership functions as a critical mediating factor that amplifies or attenuates the impact of infrastructure investments—a finding particularly salient in the Thai educational context, where hierarchical institutional structures and principal authority play decisive roles (Hallinger and Lee, 2011).

Student motivation as a significant predictor (β = .27) extends existing theoretical models, resonating with self-determination theory (Deci and Ryan, 2000) and suggesting that teachers' perceptions of technology's impact on student engagement serve as an important extrinsic motivator for technology adoption. Observable changes in student engagement can create a positive feedback loop that reinforces teachers' technology integration behaviors.

The effect of technological infrastructure, although statistically significant, was relatively weaker compared to other predictors. The relatively weaker effect of technological infrastructure aligns with prior research suggesting that access to technology alone does not guarantee effective integration (Ertmer and Ottenbreit-Leftwich, 2010). Instead, pedagogical support and teacher readiness play a more critical role.

Recommendations

1. Recommendations for the application of research findings

Systematic digital competence development programs should be implemented, designed specifically for EFL pedagogy and focused on the intersection of technological, pedagogical, and content knowledge. These programs should be sustained, practice-based, and include ongoing mentoring support. Professional learning communities (PLCs) focused on technology integration should be formally established and institutionally supported within and across BMA schools. School leaders and BMA educational administrators should receive targeted training in technology leadership, emphasizing their critical role as facilitators and advocates of technology integration. Infrastructure investments should be complemented by structured pedagogical support, ensuring that hardware and connectivity provision is accompanied by teacher development programs.

2. Recommendations for the next research

Future longitudinal research examining how factors influencing technology integration evolve over time would substantially advance understanding. Comparative studies across different Thai educational contexts are needed to assess the generalizability of findings beyond BMA primary schools. Experimental research designs testing the causal efficacy of specific professional development interventions informed by the conceptual framework would provide valuable evidence for policy implementation. Additionally, investigation of the moderating roles of institutional support and student motivation posited in the conceptual framework warrants systematic empirical examination.

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