

Developing a Contextualized Digital Competency Framework for English Language Learners: A Needs Analysis in the Thai Context

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Abstract

This research studied the development of a contextualized digital competency framework for English language learners through analysis of international frameworks and needs assessment in the Thai context. The purposes of this research were: 1) to analyze key objectives, thematic elements, and focus areas within existing international digital competency frameworks (2015-2024), 2) to examine how learners' perceived needs and expectations for technology-based support compared to their experiences in using technology for English language learning, and 3) to identify essential components for a contextualized digital competency framework for English language learners. The research tools were: 1) systematic content analysis of international digital competency frameworks (n=30), 2) a needs assessment questionnaire (IOC=0.80, α =0.90) administered to language learners (n=1,904), 3) focus group interviews with learners (n=159) and stakeholders (n=54). The data were analyzed using 1) frequency analysis for framework components, 2) Modified Priority Needs Index (PNI modified) for needs assessment, 3) descriptive statistics for survey responses, and 4) thematic analysis for focus group data.

The results were found that: 1) content analysis revealed four key dimensions in existing frameworks: safe and responsible use (89.28%), cultural inclusivity with emphasis on equitable access (50%), pedagogical integration focused on motivation (92.85%), and lifelong learning support (46.42%); 2) needs assessment indicated significant gaps between desired and actual support levels (PNI modified=0.03-0.06), with highest needs in equitable access (M=4.26, SD=0.83) and career skill development (M=4.13, SD=0.89); 3) qualitative data from focus groups identified key challenges in motivation, resource accessibility, and self-directed learning, informing recommendations for a contextualized framework for language learners.

Keywords: Digital competency framework; Language learning technology; Educational technology integration

Introduction

Transformative Potential of ICT and AI in Language Learning

Advancements in Information and Communications Technology (ICT), particularly cloud-based solutions and Artificial Intelligence (AI), have significantly transformed language teaching and learning. As Chapelle consistently emphasizes, technology is no longer merely an auxiliary tool but a central element in how language learners access materials, engage with peers and participate in classroom-based and independent learning activities (Chapelle & Sauro, 2017). AI-powered tools, such as generative models and adaptive learning systems, have further enhanced the personalization and interactivity of language instruction, enabling learners to receive customized feedback and practice in real-time. These innovations also extend to assessments, where intelligent systems provide dynamic, data-driven insights into learners' progress and proficiency (Shetye, 2024).

Challenges in Technology Integration for Language Education

The potential of AI and ICT in language education remains largely untapped due to inadequate training in pedagogical integration. Educators often lack the skills to align technology with instructional goals, limiting its effectiveness (Farr & Murray, 2016; Healey, 2016). Kessler & Hubbard (2017) stress that technology risks being misapplied without targeted CALL training. Similarly, Karanjakwut & Sripicharn (2024) found that older EFL teachers with low digital literacy struggle with basic classroom technology. Addressing these gaps requires accessible, sustained teacher training that blends practical application, theoretical grounding, and ongoing support (Soule & Papadima-Sophocleous, 2019). Effective technology integration in language teaching requires comprehensive professional development. The COVID-19 pandemic exposed gaps in teacher readiness, particularly among Thai EFL educators with limited online teaching experience. Boonmoh et al. (2022) found that teachers struggled with reduced interaction, insufficient institutional support, and unfamiliarity with digital tools. Professional development should build technical competence, promote interactive online learning, and encourage collaboration and mentorship.

Addressing Challenges in Technology Integration for Thailand

Effective technology integration in language learning remains challenging, and qualified educators—rather than solely relying on computer programs—are essential. However, many teachers and learners lack the pedagogical knowledge to implement technology effectively. The TESOL Standard (Healey et al., 2011), the only recognized international framework, predates major shifts in digital learning and omits technology's role in fostering critical thinking. Despite 85.3% internet access, Thailand faces significant digital literacy gaps. Assessments show that 64.7% of youth and adults struggle with reading literacy, while 74.1% lack basic digital skills, contributing to 3.3 trillion baht in annual

productivity losses (World Bank Group, 2024). Ranking 39th out of 63 in digital skills, Thailand struggles to bridge access and competency (Datareportal, 2023; Nation Thailand, 2023), and the NCDC launched digital literacy programs to address this, aiming for an 80% competency score by 2027 (Saffa, 2024).

Three critical gaps are identified: outdated frameworks, limited Thailand-specific research, and insufficient localized implementation guidelines. Kessler (2016) underscores the importance of developing locally relevant technology standards. This study tackles these issues by incorporating international digital competency frameworks (2015–2024) to examine learners' needs and create context-specific guidelines that align with UNESCO's 2030 Agenda and Education Goals (UNESCO, 2018a).

Research Questions

1) What essential pedagogical components and implementation guidelines are prioritized within international digital competency frameworks (2015-2024) for English language teaching and learning?

2) How do Thai English language learners' desired technology support needs compare with their actual experiences in digital safety, cultural inclusivity, pedagogical integration, and lifelong learning?

3) What evidence-based components should be prioritized in developing a contextualized digital competency framework for Thai English language learners?

To address these research questions and develop a contextualized framework for digital competency in Thai English language education, this study employed a mixed-methods approach guided by three primary objectives that align with the identified research gaps and stakeholder needs. These objectives were developed to generate empirical evidence through framework analysis, needs assessment, and stakeholder consultation, ultimately guiding the development of practical guidelines for technology integration in language teaching and learning.

Research Objectives

1) To analyze essential components of international digital competency frameworks (2015-2024) that support effective technology integration in language teaching and learning, focusing on pedagogical approaches and implementation guidelines for the Thai context.

2) To examine the alignment between Thai English language learners' technology needs and current support systems through statistical analysis of gaps in digital safety, cultural inclusivity, pedagogical integration, and lifelong learning dimensions.

3) To develop evidence-based recommendations for a contextualized digital competency framework that addresses the specific needs of Thai English language learners, validated through stakeholder feedback and public hearing.

Methodology

This mixed-methods study employed a comprehensive approach with three methodologically aligned phases. The first phase comprised a systematic analysis of international digital competency frameworks using a structured analysis instrument. The instrument was developed through expert review (n=5) in educational technology and language teaching, achieving content validity (IOC = 0.85) and high inter-rater reliability. Framework selection (n=30, 2015-2024) followed systematic criteria: digital competency focus, language education relevance, and institutional recognition.

The second phase utilized mixed methods for needs assessment. A 30-item questionnaire was developed through framework analysis and expert validation (n=7: 3 ELT specialists, two educational technologists, and two assessment experts; IOC = 0.80). The instrument demonstrated high reliability after pilot testing (n=45) (Cronbach's α = 0.90). The questionnaire was administered to 1,904 participants selected through stratified random sampling, with strata determined by educational level, geographic region, and school size. Concurrent focus groups with learners (n=159) from five public schools employed a semi-structured protocol validated through expert review (IOC = 0.82) and pilot testing.

The third phase involved stakeholder consultation through interviews with 54 participants selected through purposive sampling: 12 ELT faculty with a minimum of ten years of experience, 30 practicing teachers, and 12 educational technology experts. The interview protocol underwent expert validation (IOC = 0.82), focusing on implementation considerations and contextual adaptations.

Data analysis integrated multiple approaches. Framework analysis employed frequency analysis of key components. Quantitative data underwent descriptive statistical analysis and Modified Priority Needs Index (PNI modified) calculation to identify support gaps. Qualitative data were analyzed through thematic analysis, with findings integrated to inform framework development.

Research Results

The findings are presented according to the three research objectives, integrating quantitative and qualitative data.

1). Analysis of Essential Components in International Digital Competency Frameworks (2015-2024).

A systematic literature review and content analysis were conducted to identify the key objectives, thematic elements, and focus areas within existing international digital competency frameworks developed between 2015 and 2024. Thirty frameworks were selected based on their relevance to digital competency development, language learning, and their alignment with the Thai educational context. The content analysis revealed four critical dimensions for effective technology integration in language teaching and learning, as presented in Table 1.

Table 1. Content Analysis of International Digital Competency Frameworks (2015-2024)

Dimensions	Key Themes	Prevalence (%)
Safe, effective, and responsible use of digital technology	Understanding cyber safety, security, and media	89.28
	Proficiency in using fundamental functions of digital devices	64.28
Culturally inclusive and equitable use of digital technology	Awareness of equitable access to appropriate digital technologies and resources	50.00
	Use of digital technology with respect for individual differences	42.85
Technological pedagogical content knowledge and language learning for future work and skills	Using digital technology to motivate classroom learning	92.85
	Using digital technology to search for materials related to classroom learning and practices	89.28
Digital technology for lifelong language learning	Identifying learning needs and planning learning processes continuously	46.42
	Knowing how to record lifelong learning progress	46.42

The table demonstrates the prominence of each dimension and its associated key themes within the analyzed frameworks. The most prevalent dimension was technological pedagogical content knowledge and language learning for future work and skills, with over 90% of the frameworks emphasizing using digital technology to motivate classroom learning and search for relevant materials. Safe, effective, and responsible use of digital technology was also highly represented, with nearly 90% of the frameworks addressing the understanding of cyber safety, security, and media.

Despite these findings, the analysis revealed a significant gap in the lack of ELT-specific digital competency frameworks that provide contextualized pedagogical approaches and implementation guidelines for the Thai context. This highlights the need

to develop a framework that addresses the unique requirements of English language teaching and learning in Thailand while incorporating the essential components identified through content analysis.

2). Examining the Alignment Between Thai English Language Learners' Technology Needs and Current Support Systems

Survey data (n=1,904) indicated a strong demand for guidance in digital safety (M=4.15, SD=0.90), yet actual support was lower (M=3.91, SD=0.98, PNIM=0.06). Focus groups confirmed concerns about online risks, misinformation, and the lack of structured digital literacy training. One student noted, "I wish teachers provided more guidance on filtering out fake news and securing online accounts".

Equitable access to digital learning tools was another concern. Learners rated its importance highly (M=4.26, SD=0.83), but their experiences were less favorable (M=4.04, SD=0.90, PNIM=0.05). Socio-economic disparities affected learners' ability to access quality digital resources. A student remarked, "I only have an old phone, while my friends have good computers at home".

Pedagogical integration of technology was rated as essential (M=4.23, SD=0.84), yet implementation was limited (M=4.05, SD=0.88, PNIM=0.04). Key barriers included inadequate teacher training and inconsistent digital infrastructure. Teachers cited a need for professional development to effectively integrate digital tools into language instruction.

Lifelong learning through technology also showed a gap, with learners expressing strong interest (M=4.16, SD=0.89) but reporting insufficient support (M=4.00, SD=0.98, PNIM=0.04). Many lacked motivation and clear guidance, as one student explained, "Practicing English alone is boring. I need structured activities".

These gaps necessitate targeted interventions, including structured digital literacy training, enhanced teacher support, and equitable access to technology for language learning.

3). Development of an Evidence-Based Contextualized Digital Competency Framework

This study proposed a contextualized digital competency framework tailored to Thai English language learners based on the identified gaps. The framework was structured around four primary dimensions: **digital safety and responsible use, cultural inclusivity and equitable access, pedagogical integration of technology, and lifelong learning support**. These dimensions address the disparities in current support systems and provide a structured approach to improving technology use in English language learning.

The framework was validated through stakeholder feedback and public hearings (n=350), ensuring alignment with national education policies and international digital literacy standards. Stakeholders emphasized the need for better teacher training, expanded

digital infrastructure and localized digital learning content. One teacher stated, "Without structured professional development, effectively integrating digital tools is challenging." Key recommendations included improving teacher education on technology use, guaranteeing equitable access for learners, and integrating practical digital literacy curricula into English language programs. The proposed framework aims to help learners develop the digital competencies essential for language acquisition and global communication.

Implementing this framework is expected to bridge the gap between learners' needs and available technological support, fostering digital fluency and self-directed learning. Future initiatives should focus on investing in **teacher training, improved digital infrastructure, and inclusive learning technologies** to enhance digital competency among Thai English language learners.

Discussion

This study critically examines the alignment between Thai English language learners' digital competency needs and the current support systems. Guided by the research objectives, it investigates (1) the key principles and focus areas of international digital competency frameworks (2015–2024), (2) the extent to which learners' technological needs align with existing support systems across digital safety, cultural inclusivity, pedagogical integration, and lifelong learning, and (3) the development of an evidence-based digital competency framework tailored to the specific needs of Thai English language learners.

1. Key Principles and Areas on Competency Frameworks

Existing frameworks provide broad guidance but often overlook ELT-specific needs. Three key gaps emerge: (1) lack of ELT-specific indicators, (2) absence of contextualized implementation strategies, and (3) outdated recommendations misaligned with current technology (Kessler, 2016; UNICEF, 2023). While most frameworks emphasize general education, their applicability to ELT remains limited. A systematic analysis of 30 global frameworks identified key elements such as pedagogical integration, digital safety, equity, and lifelong learning. However, concrete ELT applications were lacking. Hubbard and Levy (2016) noted that theory-driven frameworks enhance technology's alignment with pedagogical objectives, improving its effectiveness in language instruction. This study synthesizes insights from international frameworks, aligning them with ELT to propose a contextualized digital competency framework. The framework prioritizes practical language learning applications, ensuring alignment with UNESCO's 2030 Agenda (UNESCO, 2018b).

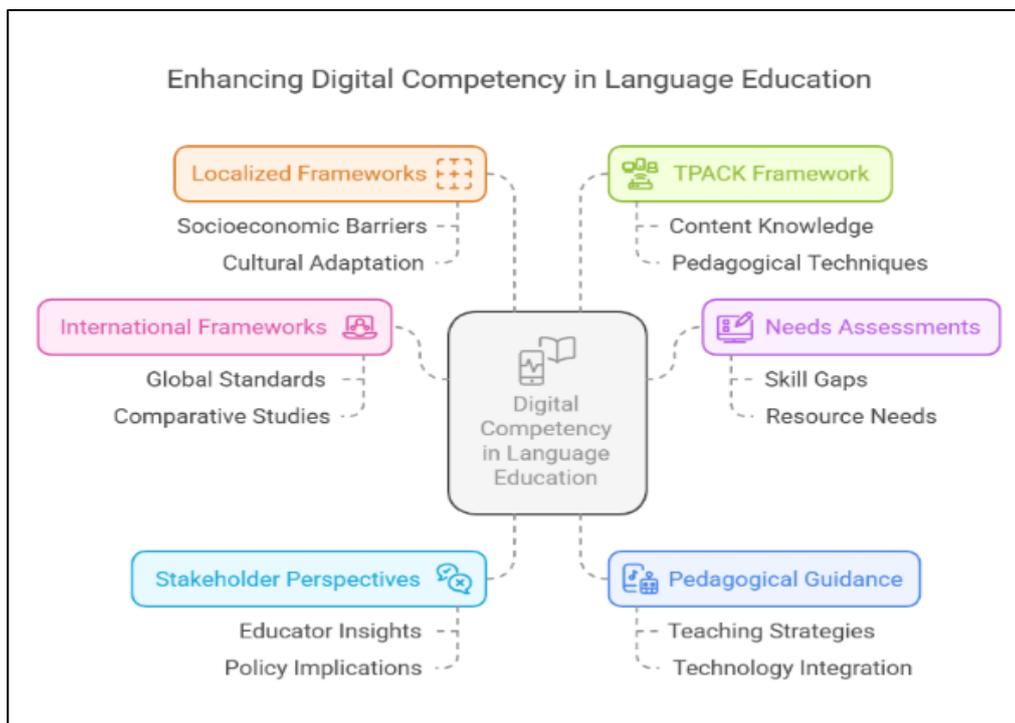
2. Learners' Perceived Needs vs. Actual Experiences in Technology-Based Language Learning

A significant gap exists between learners' expectations and available support for technology use. While students recognize digital tools' potential, they often lack guidance on effective applications. **Safe, Effective, and Responsible Use:** Learners need support for online safety, privacy, and responsible tech use. In Thailand, 60% of children face online risks, highlighting the urgency of digital safety education (Office of Policy and Strategic Affairs, Electronic Transactions Development Agency (ETDA), 2020; Yuan, Wang, & Eagle, 2019). **Equitable Access:** Socioeconomic disparities limit digital learning opportunities, as many students lack reliable internet or personal devices, creating inequities in ELT (UNESCO, 2018b). The UN's SDGs emphasize the need for inclusive, technology-integrated education. **21st-Century Skills & Workforce Readiness:** Learners seek digital literacy beyond language learning, including innovation and critical thinking. Although Thai education policies prioritize these skills, they lack ELT-specific implementation strategies. **Technology's Role in Engagement & Learning Outcomes:** Effective teacher guidance enhances technology's impact on learning, with research confirming that structured pedagogical strategies improve digital tools' effectiveness in ELT. These findings reveal a disconnect between available technology and its meaningful use, underscoring the need for structured, pedagogically informed technology integration.

3. Essential Components for a Contextualized Digital Competency Framework for English Language Learners

This study proposes a tailored digital competency framework to address ELT-specific gaps. **Pedagogically Driven Technology Integration (TPACK):** Clear guidelines and practical examples help teachers integrate technology effectively. **Safe, Responsible, and Ethical Technology Use:** With high internet penetration in Thailand, digital literacy must emphasize privacy, media literacy, and online safety (ETDA, 2020). **Cultural Inclusivity and Equitable Access:** To address socioeconomic disparities, the framework promotes flexible, low-cost digital solutions (UNESCO, 2018b). **21st-Century Skill Development:** Digital competencies should extend beyond language learning to include problem-solving, creativity, and workplace communication (Cambridge Assessment English, 2020). **Adapting to Emerging Technologies:** AI, AR, VR, and IoT offer new opportunities in ELT (Davis, 2018; UNESCO, 2019). The framework aligns digital competency development with pedagogical objectives, ensuring inclusive, engaging, and future-ready learning environments.

Knowledge



Source: Synthesized by the researchers

Figure 1 illustrates that the study thoroughly surveyed digital competency in language education by integrating insights from international frameworks, needs assessments, and stakeholder perspectives. The findings underscore that technology is inadequate for improving learning outcomes unless accompanied by structured pedagogical guidance. Additionally, it highlights the importance of localized frameworks that address socioeconomic and cultural barriers, thereby ensuring equitable access to digital resources.

This study highlights ELT-specific applications that foster secure, inclusive, and adaptive digital learning environments by extending the Technological Pedagogical Content Knowledge (TPACK) framework to English language teaching (ELT). It also stresses the need for targeted strategies that equip educators with the skills to integrate technology effectively, creating a learning ecosystem that promotes digital literacy, pedagogical effectiveness, and equitable language education opportunities.

Conclusions

This study underscores the need for a contextualized digital competency framework in language education, using Thailand as a case study. While global frameworks like UNESCO's ICT Competency Framework and TESOL Technology Standards offer foundational guidance, they fail to address local challenges fully. Findings highlight four key

dimensions: safe and responsible use, cultural inclusivity, pedagogical integration, and lifelong learning support. Despite high technology access, disparities persist, particularly in equitable access and career skill development. The study stresses the importance of clear TPACK guidelines and contextualized examples. Acknowledging limitations such as a focus on English-language sources and data collection limited to Thailand's Western provinces, this study calls for broader research on emerging competency frameworks for ELT.

Suggestions

Suggestions for Application

Future initiatives should aim to develop ELT-specific digital competency frameworks, strengthen teacher training in digital pedagogy with TPACK guidelines and examples, promote equitable access to technology through targeted interventions, and enhance digital safety education by incorporating cybersecurity, digital ethics, and online privacy into school curricula.

Suggestions for Future Research

Future research should **explore the impact of emerging technologies** like AI, VR/AR, and IoT on engagement, assessment, and real-world applications in language education. Studies should also **extend across diverse contexts**—urban, rural, and underserved areas—to establish a comprehensive digital competency framework for ELT. Moreover, effective digital pedagogical training models that improve ELT educators' technological skills and integration strategies must be evaluated. Further investigation is warranted into how technology supports **student autonomy and self-regulated learning** in digital environments.

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