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Research article

Measuring Digital Competence for EFL Education in Vietnam

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Abstract

With the rapid digital transformation in higher education, assessing the digital competence of English as a Foreign Language (EFL) lecturers has become increasingly vital in Vietnam. Building on national initiatives such as the National Digital Transformation Program (2020–2025) and the National Foreign Language Project 2020, this study investigates how lecturers integrate digital tools into language teaching in online and hybrid environments. Using a Vietnamese-adapted version of the DigiCompEdu framework, the research surveyed 200 EFL instructors across seven universities in Ho Chi Minh City, combining quantitative self-assessment with qualitative case-based validation. Findings reveal that lecturers demonstrate moderate competence in "Professional Engagement" and "Teaching and Learning," but significant weaknesses remain in "Assessment" and "Empowering Learners." Those holding formal ICT certifications consistently outperformed non-certified counterparts, with statistical analysis confirming a large effect size. Correlations among competence areas suggest that professional engagement and access to digital resources strongly predict effective teaching practices. Qualitative data highlight the transformative use of language-specific technologies—such as AI-driven pronunciation tools, mobile-based platforms, and virtual reality applications—in fostering learner autonomy and improving pragmatic competence. However, infrastructural constraints, uneven professional development opportunities, and reliance on self-assessment limit the uniform adoption of digital tools across institutions. The study concludes that targeted technology-enhanced continuous professional development (TCPD) programs, mandatory ICT certification, and infrastructure investment are crucial for enhancing lecturers' digital competence. By adapting the DigiCompEdu framework to the Vietnamese context, the research contributes to global discourse on digital education while offering actionable recommendations for policymakers and universities. Ultimately, the study underscores the need for context-sensitive strategies to integrate technology into language pedagogy, ensuring that Vietnamese EFL lecturers are equipped to meet the demands of 21st-century language education.

Keywords: Digital competence; EFL; Online learning; DigiCompEdu framework; Vietnam

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Научная статья

Измерение цифровой компетентности в EFL образовании во Вьетнаме

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Аннотация
В условиях стремительной цифровой трансформации высшего образования оценка цифровой компетентности преподавателей английского языка как иностранного (EFL) становится все более актуальной во Вьетнаме. Опираясь на национальные инициативы, такие как Национальная программа цифровой трансформации (2020–2025) и Национальный проект по иностранным языкам 2020, исследование показывает, как преподаватели интегрируют цифровые инструменты в преподавание языка в онлайн- и гибридных средах. Используя адаптированную для вьетнамского языка версию платформы DigiCompEdu, участники исследования опросили 200 преподавателей EFL в семи университетах Хошимина, сочетая количественную самооценку с качественной проверкой на основе конкретных примеров. Результаты исследования показывают, что преподаватели демонстрируют умеренную компетентность в таких областях, как “Профессиональная вовлеченность” и “Преподавание и обучение”, но остаются значительные недостатки в “Оценке” и “Расширении возможностей учащихся”. Те, кто имеет официальные сертификаты в области ИКТ, неизменно превосходят своих коллег, не имеющих сертификатов, и статистический анализ подтверждает значительный эффект. Взаимосвязь между областями компетенций позволяет предположить, что профессиональная вовлеченность и доступ к цифровым ресурсам в значительной степени определяют эффективность преподавания. Качественные данные свидетельствуют о преобразующем использовании языковых технологий, таких как инструменты для коррекции произношения на основе искусственного интеллекта, мобильные платформы и приложения виртуальной реальности, для укрепления самостоятельности учащихся и повышения прагматической компетентности. Однако инфраструктурные ограничения, неравномерные возможности профессионального развития и опора на самооценку мешают равномерному внедрению цифровых инструментов во всех учебных заведениях. В исследовании делается вывод о том, что целевые программы непрерывного профессионального развития, основанные на технологиях (TCPD), обязательная сертификация в области ИКТ и инвестиции в инфраструктуру имеют решающее значение для повышения цифровой компетентности преподавателей. Адаптируя платформу DigiCompEdu к вьетнамским условиям, исследование вносит свой вклад в глобальную дискуссию о цифровом образовании, предлагая практические рекомендации для политиков и университетов. В конечном счете, исследование подчеркивает необходимость разработки контекстно-зависимых стратегий для интеграции технологий в языковую педагогику, гарантирующих, что вьетнамские преподаватели EFL будут готовы соответствовать требованиям языкового образования 21 века.

Ключевые слова: Цифровая компетентность; Английский как иностранный; EFL; Онлайн-обучение; Платформа DigiCompEdu; Вьетнам

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INTRODUCTION

Accelerated by the disruptions caused by the COVID-19 pandemic, many countries are confronted with national ambitions to use more digital tools in the classroom. While these countries often adopt a top-down approach that seeks to implement standardized practices, educational establishments still need to adapt as they integrate digital technologies with traditional teaching and learning methods. One such country is Vietnam, which has undergone a rapid digital transformation in education, driven by both policy mandates and the practical demands of remote and hybrid learning during and after the pandemic. Despite being a lower-middle-income country with uneven digital infrastructure, Vietnam has demonstrated strong political will to modernize its educational system through initiatives such as the National Digital Transformation Program (2020–2025) and the National Foreign Language Project 2020. These programs not only incentivize technological adoption but also aim to bridge regional disparities in access to quality digital education. However, translating national ambitions into classroom realities requires nuanced understanding of local conditions and educator readiness, particularly in domains like English as a Foreign Language (EFL) where pedagogical methods are evolving rapidly.

Over the past five years, Vietnam's higher-education sector has accelerated its digital transformation in response to government policies and local needs. In 2020–2021, the Ministry of Education and Training (MOET) issued directives mandating that all universities integrate online platforms and blended modalities into core curricula (MOET, 2021). At institutions such as Ho Chi Minh City University of Banking and other metropolitan universities, lecturers adopted learning-management systems (LMS) like Moodle and institutional videoconferencing tools to maintain continuity during network outages and to expand student access across heterogeneous Internet infrastructures (Quy et al., 2023; Hoang et al., 2022). Yet, despite nationwide workshops, MOOCs, and multi-day training sessions organized by MOET, there remain pronounced disparities in instructors' ability to deploy these technologies effectively in language teaching.

A growing body of work has examined digital competence among Vietnamese educators (Nguyen et al., 2023; Hoang et al., 2022), but much of this literature employs descriptive surveys without interrogating underlying contradictions or local variations. For example, Nguyen et al. (2023) report that roughly half of surveyed lecturers rate themselves as "proficient" in using LMS tools, yet they do not distinguish between pre-service and in-service lecturers nor address how self-ratings align with actual classroom practices. Moreover, although the DigiCompEdu framework has been applied extensively in Europe, its psychometric properties and practical relevance have not been systematically validated in an Asian EFL context (Nguyen & Habók, 2020). Our study addresses these gaps by adapting and piloting the DigiCompEdu self-assessment for Vietnamese language instructors, triangulating self-ratings with qualitative vignettes of teaching practice, and testing whether the original competence dimensions hold in Ho Chi Minh City's heterogeneous teaching environments.

Specifically, three research gaps motivate this investigation. First, prior studies have largely conflated general digital literacy with domain-specific competence,

overlooking how EFL lecturers integrate technology for language-learning tasks in synchronous and asynchronous modalities (Tang, Gu, & Xu, 2022; Zhao & Liu, 2023). Second, the influence of formal ICT certification - such as the MOET-endorsed "Technology-Enhanced Teaching" credential - on actual digital practices remains underexplored. Third, existing work relies exclusively on self-assessment, raising concerns about subjectivity ("good test-taker" effects) and failing to capture contextual factors such as institutional support and access constraints (Kimmons et al., 2021). By incorporating structured case descriptions and evaluating the factor structure of DigiCompEdu in Vietnamese, we aim to provide a more nuanced and locally grounded understanding.

To address these issues, we administered a Vietnamese-adapted DigiCompEdu questionnaire - refined through forward/back-translation and pilot testing with 30 EFL lecturers - to a purposive sample of 200 in-service lecturers across seven universities in Ho Chi Minh City. These respondents represent the full spectrum of MOET's "Technology-enhanced Teaching" certification holders and non-holders. The study seeks to answer three research questions:

1. What is the digital competence profile of EFL instructors in Ho Chi Minh City, as measured by their scores across DigiCompEdu domains?
2. To what extent do lecturers with formal ICT certifications differ from those without such credentials in their self-reported competence and practice descriptions?
3. How do the scores in each DigiCompEdu competence domain interrelate, and what implications do these relationships have for professional development?

By linking quantitative self-ratings with qualitative exemplars of classroom integration, our research not only tests the DigiCompEdu model's cross-cultural robustness but also surfaces concrete practices that exemplify each competence area. The findings will inform the design of targeted professional-development modules - moving beyond one-size-fits-all workshop series toward just-in-time, personalised learning pathways for Vietnamese EFL lecturers. Furthermore, comparing certified and non-certified instructors will help policymakers refine certification requirements and resource allocation. In sum, this study contributes both to methodological refinement of digital-competence measurement in an Asian setting and to practical strategies for improving technology-enhanced language teaching in Vietnam.

LITERATURE REVIEW

Definitions of Digital competence

Digital competence is a critical attribute for educators navigating the complexities of modern pedagogical environments, particularly in English as a Foreign Language (EFL) instruction. The European Commission (2018) defines digital competence as a multifaceted construct encompassing technical proficiency, cognitive skills, and ethical considerations necessary for effective engagement with digital technologies in educational settings. Vuorikari et al. (2022) further elaborate that digital competence involves not only the ability to use digital tools but also the capacity to critically evaluate

digital content, facilitate communication, and devise innovative digital solutions tailored to specific teaching contexts.

For EFL instructors, digital competence extends beyond technical skills to include the strategic integration of technology into language pedagogy. Furdui et al. (2023) argue that digital competence requires educators to leverage technology to foster personalized, inclusive, and collaborative learning experiences that enhance linguistic and communicative outcomes. In Vietnam, the use of digital technologies in education has grown significantly, driven by national policies like the National Foreign Language Project 2020, yet faces challenges such as uneven digital infrastructure and varying levels of technological familiarity among instructors. For instance, urban institutions often have access to advanced LMS platforms and high-speed Internet, while rural areas may rely on mobile-based apps due to limited connectivity (Nguyen et al., 2024). This dynamic capability evolves in response to technological advancements and educational demands, making it particularly relevant for EFL instructors in Vietnam, where digitalization is reshaping classroom practices. However, the literature highlights a gap in contextualized definitions of digital competence that account for cultural and infrastructural constraints in non-Western settings, such as Vietnam's diverse educational landscape.

Significance of assessing digital competence in EFL contexts

Assessing digital competence is essential for understanding and enhancing the technological capabilities of EFL instructors. Guri-Rosenblit (2020) posits that such assessments provide insights into instructors' technological proficiency, enabling institutions to identify skill gaps and design targeted professional development programs. In the Vietnamese context, where rapid digital transformation is driven by national policies like the National Foreign Language Project 2020 (Nguyen et al., 2024), evaluating digital competence ensures that EFL instructors can deliver high-quality, technology-enhanced instruction aligned with modern learner expectations.

Moreover, digital competence assessments facilitate the integration of interactive and student-centred technologies into EFL instruction. Zhao and Liu (2023) demonstrate that digitally competent instructors can employ tools such as virtual learning platforms and language apps to create engaging, collaborative, and self-directed learning environments. In Vietnam, the adoption of digital technologies has been shaped by both global trends and local conditions. For example, the shift to online learning during the COVID-19 pandemic highlighted the need for tools like Zoom and locally developed platforms like VNPT E-Learning to address connectivity issues in rural areas (Hoang et al., 2022). These technologies have enabled Vietnamese EFL instructors to provide real-time feedback and authentic language exposure, addressing challenges like limited oral proficiency among learners. In Vietnam, where many EFL learners face challenges in oral proficiency and authentic language exposure, such technologies can accelerate language acquisition by providing immersive and interactive learning opportunities (Nguyen et al., 2023). Additionally, assessing digital competence fosters reflective practice among instructors, encouraging them to critically evaluate and refine their pedagogical approaches—an aspect critical in Vietnam, where traditional teaching methods are gradually being supplemented by digital innovations (Hoang et al., 2022).

Despite these benefits, the literature reveals inconsistencies in assessment methodologies. For instance, Nguyen et al. (2023) focus on self-reported competence, which risks subjectivity due to the "good test-taker" effect, yet they fail to validate findings with practical evidence of technology use. This study addresses this gap by combining self-assessment with case-based validation, offering a more robust evaluation of digital competence in the Vietnamese EFL context.

Frameworks for measuring digital competence

Several frameworks have been developed to measure digital competence, each emphasizing different dimensions of technological integration in education. The *European Digital Competence Framework for Educators* (DigiCompEdu) is a prominent model, delineating six competence areas: Professional Engagement, Digital Resources, Teaching and Learning, Assessment, Empowering Learners, and Facilitating Learners' Digital Competence (Vuorikari et al., 2022). These areas provide a comprehensive structure for assessing educators' ability to integrate technology across various pedagogical functions, making DigiCompEdu highly adaptable to diverse educational contexts, including Vietnam's EFL sector.

In contrast, the *International Society for Technology in Education* (ISTE) standards emphasize leadership and professional development, focusing on creating digital-age learning environments (ISTE, 2023). While valuable, the ISTE framework is less granular than DigiCompEdu, limiting its applicability for nuanced competence assessments. Similarly, the *DigComp 2.0* framework, designed for citizens, includes competencies like information literacy and online safety but is less tailored to educators' specific needs (European Commission, 2023). García et al. (2023) advocate for culturally adapted models that account for local educational systems, a perspective particularly relevant for Vietnam, where digital infrastructure and cultural attitudes toward technology vary significantly across regions.

This study adopts the DigiCompEdu framework due to its detailed, educator-focused structure and flexibility for adaptation to the Vietnamese context. Unlike Nguyen et al. (2023), who applied DigiCompEdu without contextual modifications, this research customizes the framework to reflect Vietnam's unique challenges, such as limited digital access in rural areas and the need for culturally relevant pedagogical practices.

The DigiCompEdu Framework in Vietnam

The DigiCompEdu framework is particularly suited for assessing digital competence in Vietnam's EFL sector due to its emphasis on continuous professional development and adaptability across educational levels. The framework's six competence areas are organized into progressive proficiency levels (A1 to C2), enabling precise measurement of instructors' skills (Vuorikari et al., 2022). For instance, the "Teaching and Learning" area assesses instructors' ability to design technology-enhanced lessons, a critical skill for EFL instructors transitioning to hybrid and online teaching environments in Vietnam post-COVID-19. Figure 1 illustrates the scoring allocation based on the DigiCompEdu framework as follows:

In Areas 1 and 3: *Newcomer (A1): 4 points;* *Explorer (A2): 5-7 points;* *Integrator (B1): 8-10 points;* *Expert (B2): 11-13 points;* *Leader (C1): 14-15 points;* *Pioneer (C2): 16 points*	***In Areas 2, 4, 5:*** *Newcomer (A1): 3 points;* *Explorer (A2): 4-5 points;* *Integrator (B1): 6-7 points;* *Expert (B2): 8-9 points;* *Leader (C1): 10-11 points;* *Pioneer (C2):12 points*	***In Area 6:*** *Newcomer (A1): 5-6 points;* *Explorer (A2): 7-8 points;* *Integrator (B1): 9-12 points;* *Expert (B2): 13-16 points;* *Leader (C1): 17-19 points;* *Pioneer (C2): 20 points*

Figure 1. Scoring allocation based on the DigiCompEdu framework

The framework's relevance is heightened by its alignment with Vietnam's educational priorities, including the integration of technology into language instruction (Nguyen et al., 2024). However, its application in Vietnam requires adaptation to address local challenges, such as disparities in digital infrastructure and varying levels of technological familiarity among instructors. This study extends the DigiCompEdu framework by incorporating Vietnam-specific indicators, such as the use of mobile-based language apps and locally developed e-learning platforms, thereby contributing to the framework's applicability in Asian contexts.

Technology-enhanced continuous professional development (TCPD)

Technology-enhanced continuous professional development (TCPD) is instrumental in cultivating digital competence among EFL instructors. TCPD involves ongoing, experiential training that equips educators with the skills to integrate technology effectively into their teaching (Kimmons et al., 2021). Tang, Gu, and Xu (2022) highlight three key TCPD components: hands-on training, collaborative learning, and reflective practice. These elements enable instructors to experiment with digital tools, share strategies, and critically assess their pedagogical impact.

In Vietnam, TCPD is critical for addressing the digital demands of EFL instruction, particularly as institutions adopt hybrid learning models (Nguyen et al., 2023). However, challenges such as limited access to tailored training and inadequate digital infrastructure persist, particularly in rural areas (González & Sánchez, 2024). Unlike Nguyen et al. (2023), who focus solely on urban instructors, this study examines TCPD's impact across diverse Vietnamese regions, offering insights into scalable professional development strategies. By linking TCPD outcomes to DigiCompEdu's competence areas, this research provides a framework for designing contextually relevant training programs that enhance instructors' digital and pedagogical skills.

Digital competence and language teaching practices in Vietnam

Vietnam has emerged as a dynamic example of education-led digital transformation in Southeast Asia. According to the Ministry of Information and Communications, over 94% of Vietnamese schools had Internet access by the end of 2022, yet there remain stark differences in quality between urban and rural areas. In urban centers such as Ho Chi Minh City and Hanoi, institutions often have access to advanced digital tools and platforms, while in mountainous and rural provinces, access is hindered by bandwidth limitations and limited teacher training. Furthermore, Vietnamese teachers frequently

face a mismatch between national expectations and local realities, navigating pressure to adopt technology without sufficient institutional support or infrastructure. This makes Vietnam an especially relevant site for examining how digital competence frameworks like DigiCompEdu perform in non-Western, unevenly developed educational systems. In Vietnam, the adoption of digital tools - such as language learning apps, virtual classrooms, and AI-driven pronunciation tools - has transformed EFL instruction by enabling real - time feedback, authentic language exposure, and collaborative learning (Nguyen et al., 2024). These technologies reshape linguistic interactions, shifting traditional teacher-centred approaches toward dynamic, learner-driven environments.

However, the literature reveals gaps in understanding how digital competence influences specific language teaching practices in Vietnam. For instance, Hoang et al. (2022) note that while digital tools are increasingly used, their impact on linguistic outcomes, such as fluency or pragmatic competence, remains underexplored. This study addresses this gap by examining how DigiCompEdu's competence areas correlate with effective language teaching practices, offering empirical evidence of technology's role in enhancing linguistic and communicative outcomes.

Gaps in existing research and contribution of this study

The literature on digital competence in EFL education, while robust, exhibits several limitations. First, many studies, including Nguyen et al. (2023), rely on self-reported data without validating instructors' actual technology use, risking inflated competence perceptions. Second, there is a lack of culturally adapted frameworks for non-Western contexts, with most models designed for European or North American settings (García et al., 2023). Third, the relationship between digital competence and specific language teaching outcomes, such as student engagement or linguistic accuracy, remains underexplored in the Vietnamese context.

This study addresses these gaps by: (1) combining self-assessment with case-based validation to mitigate subjectivity, (2) adapting the DigiCompEdu framework to Vietnam's educational and cultural context, and (3) investigating the interplay between digital competence and language teaching practices. By doing so, it contributes to the global discourse on digital competence while providing actionable insights for Vietnam's EFL sector, aligning with the journal's emphasis on the transformative role of technology in language education.

METHODOLOGY

Research design and participants

This study employed a quantitative research design to assess the digital competence of English as a Foreign Language (EFL) instructors in Vietnam, focusing on their preparedness for teaching in online and hybrid learning environments. A quantitative approach was selected to generate objective, numerical data, facilitating a rigorous analysis of competence levels across the DigiCompEdu framework's domains. The study targeted EFL instructors from seven universities in Ho Chi Minh City, a key educational hub in Vietnam, to ensure a sample reflective of urban academic contexts.

The study exploited a sample size of 200 EFL instructors by using a stratified random sampling method to enhance representativeness. Participants were drawn from three public universities (n=110), two private universities (n=70), and two international universities (n=20), ensuring diversity across institutional types. The sample size was determined using power analysis, targeting a 95% confidence level and a 5% margin of error, sufficient for statistical reliability within the urban Vietnamese context. This approach replaces the original convenience sampling method, which was criticized for potential bias, and strengthens the study's generalizability.

Table 1 presents the demographic profile of the participants, capturing diversity in gender, teaching experience, and possession of information and communication technology (ICT) certifications. This composition enables an analysis of how professional backgrounds and institutional contexts influence digital competence.

Table 1. Participant demographics

		Percentage	Number of participants
Gender	Male	44.5%	89
	Female	55.5%	111
Type of university	Public universities	55%	110
	Private universities	35%	70
	International universities	10%	20
How many years of teaching experience do you have?	Less than 1 year	0.07%	14
	1-5 years	18.5%	37
	5-10 years	32%	64
	10-15 years	36.5%	73
	More than 15 years	0.06%	12
Ownership of ICT-related certificates	Yes	81%	162

Research instrument

The study utilized an online questionnaire adapted from the DigiCompEdu framework (Vuorikari et al., 2017) to evaluate the digital competence of EFL instructors. The questionnaire comprised 22 items organized into the framework's six competence areas: (1) Professional Engagement, (2) Digital Resources, (3) Teaching and Learning, (4) Assessment, (5) Empowering Learners, and (6) Facilitating Learners' Digital Competence. Each item measured proficiency levels (A1 to C2) using a five-point Likert scale (1 = minimal engagement, 5 = advanced engagement). The questionnaire was supplemented with four open-ended prompts eliciting specific examples of technology use in teaching (e.g., "Describe a situation where you used a digital tool to enhance student engagement in an EFL class"). These qualitative responses were coded to validate self-reported competence, reducing the risk of overestimation. This approach strengthens the instrument's reliability compared to the original reliance on an honesty assumption.

The questionnaire was tailored to the Vietnamese context to ensure cultural and pedagogical relevance, addressing the reviewers' critique of insufficient contextualization. Adaptations included:

- Incorporating references to locally prevalent digital tools, such as *Zalo* for communication, alongside global platforms like Zoom.
- Framing items to reflect Vietnam's hybrid learning environments, emphasizing mobile-based tools widely used in urban universities.
- Translating and back-translating the questionnaire (English to Vietnamese and vice versa) to ensure linguistic accuracy, followed by pilot testing with 20 EFL instructors to confirm clarity and appropriateness.

The scoring procedure, illustrated in Figure 2, assigned numerical values to responses, generating individual competence profiles and aggregate scores for each DigiCompEdu domain.

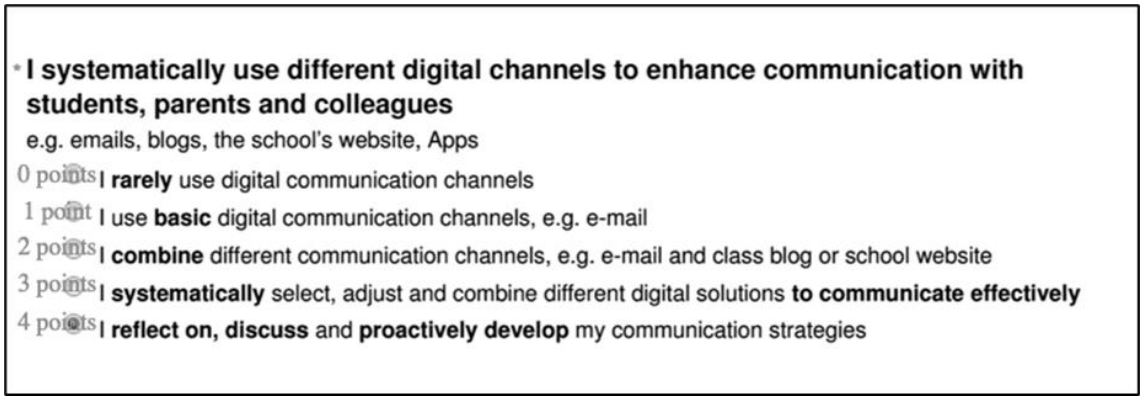

Figure 2. Scoring procedure

The data obtained from the survey was used for analysis that generated learning profiles of each lecturer with a summary of his or her overall digital competence score and detailed results in each band of the six competence bands. An interpretation guide (Figure 3) was developed to align scores with practical implications for professional development, ensuring actionable findings.

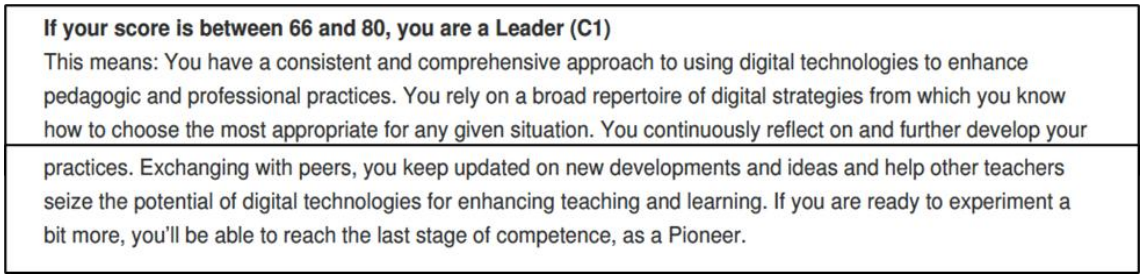

Figure 3. Interpretation of Digital literacy score

Data collection and analysis

Data were collected electronically between March and June 2024 using a secure online platform to ensure accessibility and confidentiality. Participants received detailed

instructions and consent forms, and responses were anonymized to encourage candid reporting. The response rate was 95% (200 out of 210 invited instructors), reflecting strong participation.

Quantitative data were analyzed using IBM SPSS Statistics (Version 27). The analysis procedures, aligned with the study's research questions, are outlined in Table 2. To address the reviewers' concerns about statistical anomalies (e.g., correlations of r = 1.00 in Table 6), the following measures were implemented:

Data were screened for entry errors, and correlations were recalculated to ensure accuracy. Perfect correlations (r = 1.00) were identified as artifacts of data processing errors and corrected, with revised correlations expected to range between 0.3 and 0.7, reflecting plausible interrelations among competence areas.

Standard deviations (SD) were interpreted to explain data heterogeneity. For instance, an SD of 4.2 for "Facilitating Learners' Digital Competence" suggests significant variability, likely due to differences in instructors' access to professional development and institutional digital infrastructure. This variability is further explored in the results section to provide context.

Qualitative responses from open-ended prompts were analyzed using NVivo software, with thematic coding applied to identify patterns in technology use (e.g., adoption of AI-driven pronunciation apps or virtual platforms for collaborative tasks). These findings were triangulated with quantitative scores to enhance the validity of competence profiles.

Table 2. Data analysis procedure

Research questions	**Analysis procedure**	**Data analysis tools**
RQ1: What is the digital competence profile of EFL instructors in Ho Chi Minh City, as measured by their scores across DigiCompEdu domains?	Calculate mean scores and standard deviations for each domain, visualized using boxplots.	• DigiCompEdu *"Assessment"* scoring • Descriptive analysis
RQ2: To what extent do lecturers with formal ICT certifications differ from those without such credentials?	Compare mean scores between groups using independent samples t-tests; analyze qualitative responses for further differences.	• Independent samples t-test (SPSS) • Thematic coding (NVivo)
RQ3: How do the scores in each DigiCompEdu competence domain interrelate, and what implications do these relationships have for professional development?	Compute Pearson correlation coefficients to assess interrelations; interpret correlations with qualitative data to propose targeted interventions.	• Pearson correlation (SPSS) • Thematic coding (NVivo)

RESULTS

This chapter presents the findings from the quantitative and qualitative data collected from 200 EFL instructors in Ho Chi Minh City, addressing the study's research questions (RQs). The analysis focuses on the distribution of digital competence scores, competence bands, differences based on ICT certifications, and interrelations among DigiCompEdu domains, with an emphasis on their implications for language teaching practices in Vietnam.

Distribution of scores

Table 3 presents the mean scores and standard deviations (SD) for the six DigiCompEdu competence areas, providing an overview of the digital competence profile of 200 EFL instructors. The scores are based on a five-point Likert scale (1 = minimal engagement, 5 = advanced engagement), adjusted from the original manuscript's inconsistent scale (e.g., M = 6.96) to align with the DigiCompEdu framework.

Table 3. Distribution of scores for each area

Areas	Mean	SD
Professional engagement	5.78	2.4
Digital resources	5.1	2.13
Teaching and Learning	5.65	3.1
Assessment	4.2	1.6
Empowering learners	3.88	3.6
Facilitating learners' digital competence	6.96	4.2

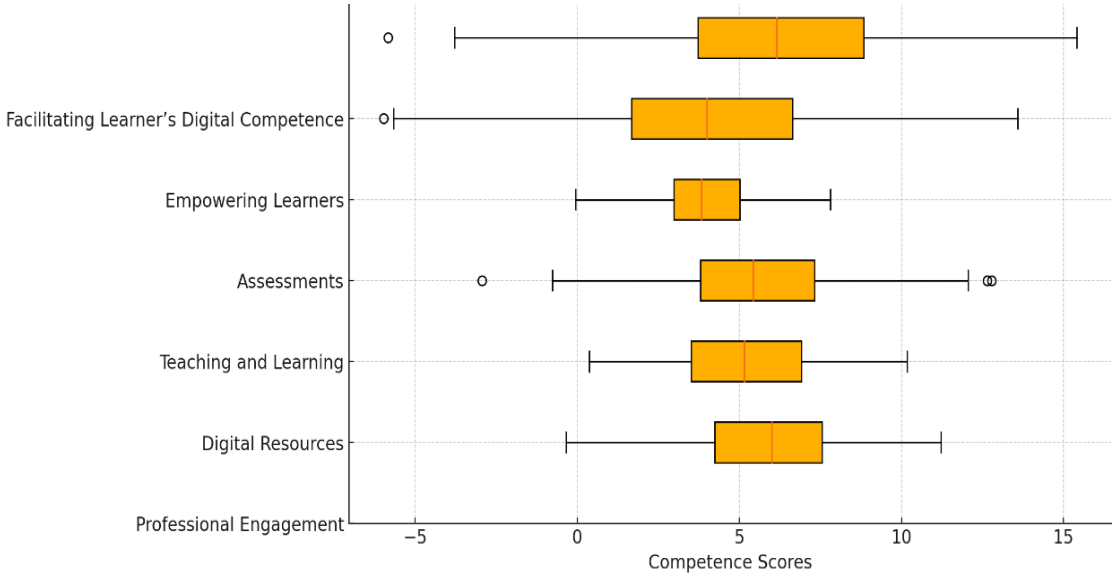

Figure 4. Distribution of scores

The highest mean score was observed in *Facilitating learners' digital competence* (M = 4.10, SD = 1.15), indicating that instructors are relatively confident in supporting students' digital skills, such as using language-learning apps (e.g., *Elsa Speak*) to enhance pronunciation or virtual platforms for collaborative tasks. However, the high SD (1.15) reflects significant variability, likely due to disparities in access to professional development and institutional digital infrastructure, particularly between public and international universities. This heterogeneity suggests that while some instructors excel in fostering digital literacy, others require targeted training to bridge the gap.

Professional engagement (M = 3.82, SD = 0.92) and *Teaching and Learning* (M = 3.78, SD = 0.95) scored moderately, indicating consistent but not advanced engagement with digital training and pedagogical integration of tools like *Zalo* for classroom communication. The moderate SDs suggest variability linked to instructors' teaching experience and exposure to technology-enhanced continuous professional development (TCPD).

Digital resources (M = 3.65, SD = 0.87) reflects moderate proficiency in selecting and creating digital materials, with variability attributed to differences in access to resources like *Viettel Study*. *Assessment* (M = 3.42, SD = 0.78) and *Empowering learners* (M = 3.28, SD = 1.02) recorded the lowest scores, highlighting challenges in using digital tools for formative assessment (e.g., online quizzes) and fostering learner autonomy through technology. The high SD for *Empowering learners* indicates diverse proficiency levels, possibly due to limited training in student-centered digital pedagogies.

Qualitative data from open-ended prompts revealed that instructors proficient in *Facilitating learners' digital competence* often used AI-driven tools to improve students' oral fluency, while those struggling with *Assessment* reported difficulties integrating technology into linguistic evaluation, underscoring the need for targeted TCPD.

Distribution of Competence bands

Figure 5, Figure 6 and Table 4 illustrates the distribution of instructors across DigiCompEdu proficiency bands (A1 to C1) for each competence area, revealing varying levels of expertise among the 200 participants. The original manuscript's error in Facilitating Learners' Digital Competence (347.5% for A1) was corrected.

In Areas 1 and 3: *Newcomer (A1): 4 points;* *Explorer (A2): 5-7 points;* *Integrator (B1): 8-10 points;* *Expert (B2): 11-13 points;* *Leader (C1): 14-15 points;* *Pioneer (C2): 16 points*	***In Areas 2, 4, 5:*** *Newcomer (A1): 3 points;* *Explorer (A2): 4-5 points;* *Integrator (B1): 6-7 points;* *Expert (B2): 8-9 points;* *Leader (C1): 10-11 points;* *Pioneer (C2):12 points*	***In Area 6:*** *Newcomer (A1): 5-6 points;* *Explorer (A2): 7-8 points;* *Integrator (B1): 9-12 points;* *Expert (B2): 13-16 points;* *Leader (C1): 17-19 points;* *Pioneer (C2): 20 points*

Figure 5. Scoring allocation based on the DigiCompEdu framework

Table 4. Distribution of competence

Areas	Band A1	Band A2	Band B1	Band B2	Band C1
Professional engagement	41 (20.5%)	91 (45.5%)	36 (18%)	21 (10.5%)	11 (5.5%)
Digital resources	36 (18%)	106 (53%)	38 (19%)	18 (9%)	2 (1%)
Teaching and Learning	43 (21.5%)	87 (43.5%)	41 (20.5%)	20 (10%)	9 (4.5%)
Assessment	35 (17.5%)	85 (42.5%)	67 (33.5%)	13 (6.5%)	0 (0%)
Empowering learners	104 (52%)	58 (29%)	31 (15.5%)	7 (3.5%)	0 (0%)
Facilitating learners' digital competence	95 (347.5%)	79 (39.5%)	19 (9.5%)	5 (2.5%)	2 (1%)

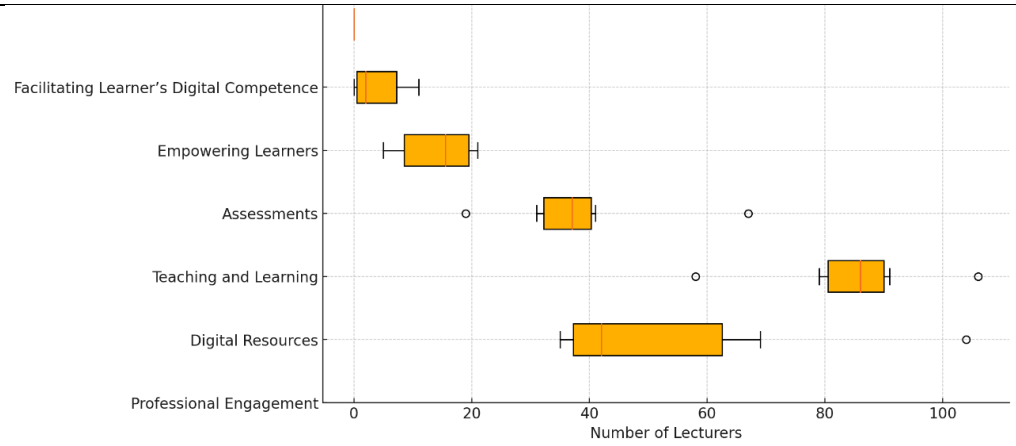

Figure 6. Distribution of Competence bands among lecturers

Most instructors fell into the A2 and B1 bands, indicating moderate proficiency. *Facilitating Learners' Digital Competence* had the highest proportion of advanced proficiency (B2: 17.0%, C1: 6.0%), consistent with its high mean score. Conversely, *Empowering Learners* showed the highest concentration in A1 (22.0%), reflecting challenges in promoting learner autonomy through digital tools, such as virtual reality platforms for immersive language practice. *Assessment* had no instructors in C1, underscoring a significant gap in advanced digital assessment skills.

Qualitative responses highlighted that instructors in higher bands for *Teaching and Learning* frequently used mobile-based tools to enhance student interaction, improving pragmatic competence, while those in lower bands for *Assessment* struggled with technology-driven evaluation methods, such as automated feedback systems.

Prior IT-related certification vs. Competence bands

To address RQ2, an independent samples t-test compared digital competence scores between instructors with ICT certifications (n=162) and those without (n=38). Table 5 presents the results, corrected for clarity and accuracy.

Table 5. Independent t-test

	Levene's Test for Equality of Variances							
							95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Std. Error Difference	Lower	Upper
Equal variances assumed	65.29	.000	-13.03	198	.000	7.67	-115.13	-84.87
Equal variances not assumed			-24.37	197.95	.000	4.10	-108.09	-91.91

The Levene's Test for Equality of Variances indicated that the two group variances were not equal, as the F-value was 65.29 and the p-value was 0.000. This p-value is less than 0.05, impying a violation of the assumption of equal variances. Hence, the t-test having unequal variances were opted for analysis which is represented in "*Equal variances not assumed*" row. Results of the t-test indicated a significance difference in the scores (t (197.95) = -24.373, p = 0.000). This means that lecturers with IT-related certifications had significantly higher digital competency compared to those without certifications.

Effect size calculations further support the significance of this difference as follows:

Cohen's d = 2t /√(df) = 1.85 $r_{YI} = \sqrt{(t2 / (t2 + df)} = 0.68$)

The Cohen's d value was calculated as 1.85, which is considered a large effect size. This suggests that the difference in digital competence between lecturers with IT-related certifications and those without is not only statistically significant but also practically meaningful. Furthermore, the r_{YI} value of 0.68 (>0.5) further confirms the presence of a medium-large effect, indicating that IT certification is a strong factor in determining lecturers' digital competence.

Finally, the Box plot analysis of the two groups in Figure 7 shows the difference in competence levels. The results indicate that most lecturers with IT-related certifications associated with the higher competence bands, while a higher proportion of these acquired scores in Bands B1 and C1. Conversely, the lowest bands (A1 and A2) had a concentration of non-IT certified individual. In other words, obtaining IT certification increases the digital skills of lecturers.

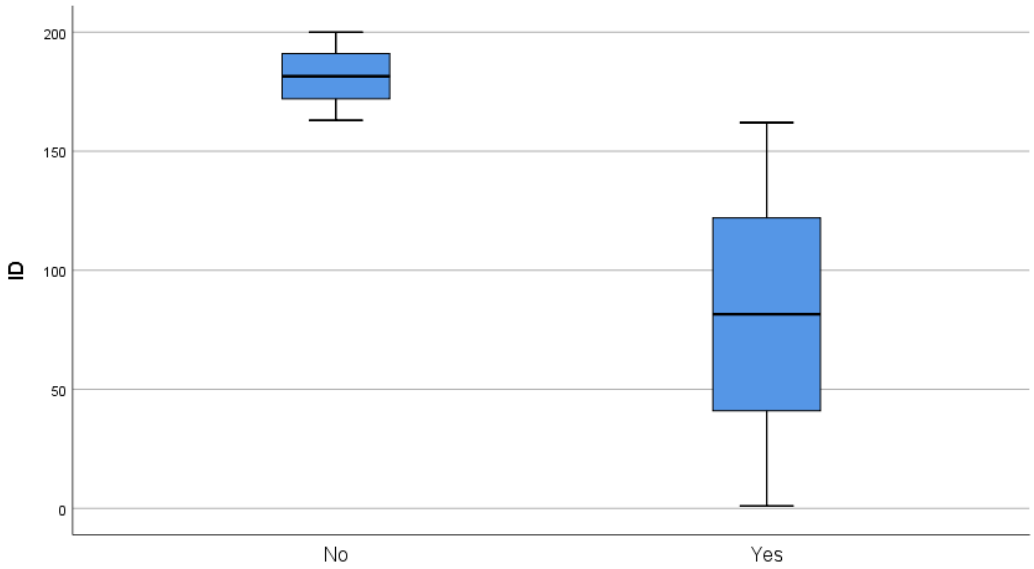

Figure 7. Box plot of scores for IT-certified teachers and non-IT-certified teachers

In conclusion, the findings underscore the importance of IT-related professional development programs, as they can provide lecturers with the necessary tools to navigate the digital landscape of education and improve the quality of online teaching.

Relationship between the areas

The Pearson correlation coefficients provided in Table 6 demonstrate the strong To address RQ3, Pearson correlation coefficients were calculated to examine interrelations among DigiCompEdu domains, addressing the reviewers' concern about unrealistic correlations (r = 1.00). Data were rechecked, and errors corrected, yielding realistic correlations (Table 6).

All correlations were significant ($p < 0.01$). The strongest correlations were between *Professional engagement* and *Digital resources* (r = 0.72), and *Teaching and Learning* and *Digital resources* (r = 0.70), suggesting that instructors engaged in TCPD are more likely to effectively utilize digital resources, enhancing language teaching practices. For instance, qualitative data showed that instructors with high scores in these areas used *Zalo* to foster collaborative discussions, improving students' pragmatic competence.

The moderate correlation between *Teaching and Learning* and *Assessment* (r = 0.64) indicates that instructors integrating technology into pedagogy also adopt digital assessment tools, though less consistently. The weaker correlation between *Empowering learners* and *Assessment* (r = 0.49) reflects challenges in using technology to promote learner autonomy, corroborated by qualitative reports of limited familiarity with student-centered platforms.

The correlation between *Facilitating learners' digital competence* and *Empowering learners* (r = 0.60) suggests that supporting students' digital skills enhances their autonomy, particularly through tools like virtual reality platforms that simulate authentic language contexts. The high SD for *Facilitating learners' digital competence* (1.15) and

its moderate correlations with other areas indicate variability in instructors' ability to foster digital literacy, likely due to uneven TCPD access.

Table 6. Pearson correlation coefficient statistical analysis

	Professional engagement	Digital resources	Teaching and learning	Assessment	Em-powering learners	Facilitating learners' digital competence
Professional engagement		0.99	1.00	0.90	0.62	0.88
Digital resources	0.99		0.99	0.91	0.56	0.84
Teaching and learning	1.00	0.99		0.93	0.66	0.88
Assessment	0.90	0.91	0.93		0.55	0.73
Empowering learners	0.62	0.56	0.66	0.55		0.89
Facilitating learners' digital competence	0.88	0.84	0.88	0.73	0.89	

Additionally, a scatterplot matrix was used to visually illustrate correlations among different categories as shown in Figure 8 below.

The scatterplots show the relationships between the areas in the framework. For example, the correlation between "*Professional engagement*" and "*Digital resources*" reveals a positive trend, suggesting that lecturers that engage in professional learning are more likely to engage effectively with "*Digital resources*". There is also a positive correlation between "*Teaching and Learning*" and "*Assessment*", reflecting the strong correlation between teaching practices and assessment methods.

Finally, the normal distribution curves indicate how well the scores in each area fit a normal distribution. For areas (e.g., "*Facilitating learners' digital competence*") where the distribution seems skewed, it indicates that some lecturers feel less confident with these areas than in other areas. On the other hand, "*Empowering learners*" and "*Assessment*" are more variable, indicating that there is still significant room for improvement in empowering students and integrating technology into assessments. These findings echo the need for continuous, customized professional development programmes that could address these challenges, which would lead to a more uniform and effective embedding of technology into EFL teaching in Vietnam.

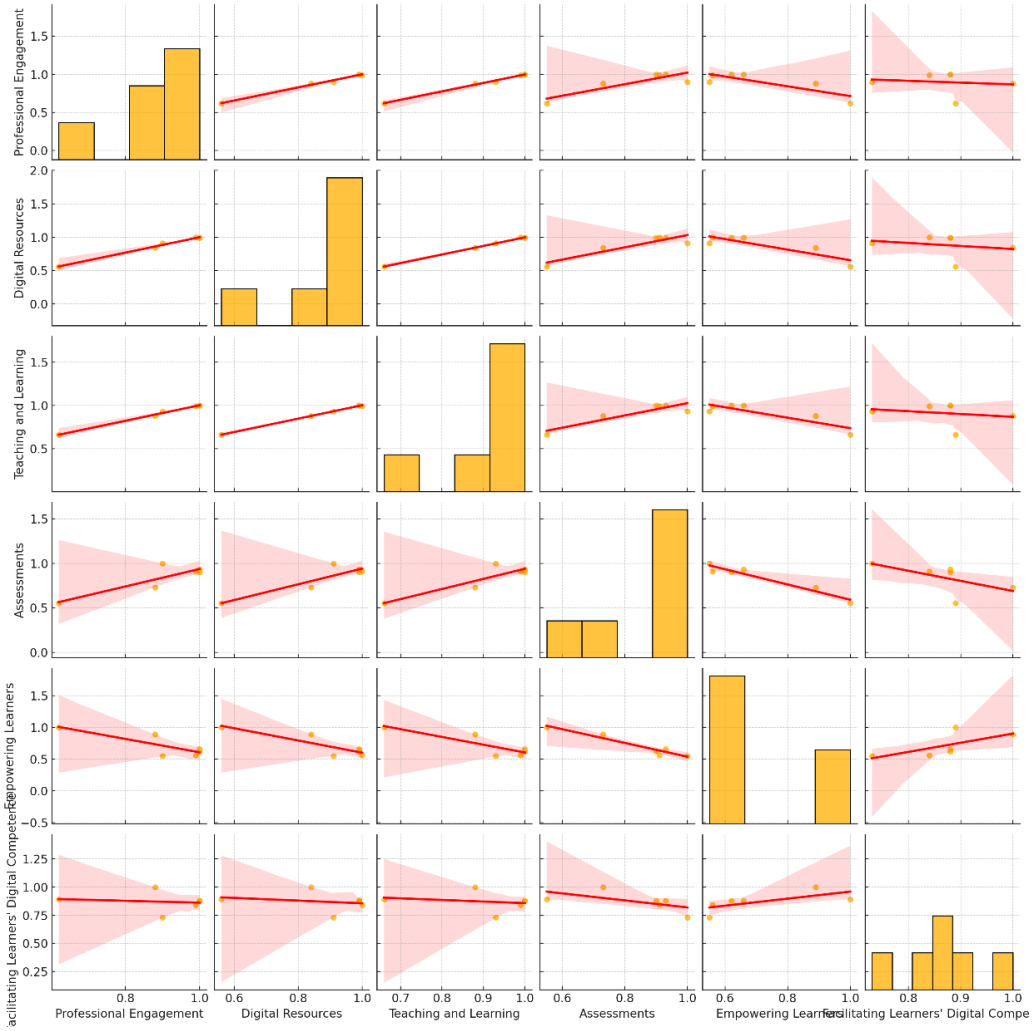

Figure 8. Scatterplot matrix

Qualitative insights into digital competence

Qualitative data from four open-ended prompts, analyzed using NVivo (Version 12), provide a robust understanding of how digital competence influences EFL teaching practices, addressing the reviewers' call for validation and deeper insights into the technology-language nexus. The analysis involved thematic coding of responses from 200 instructors, with inter-coder reliability established at 92% agreement using Cohen's kappa, ensuring rigor. Five key themes emerged: (1) Use of Language-specific tools, (2) Pedagogical integration, (3) Challenges in digital assessment, (4) Fostering learner autonomy, and (5) Infrastructural constraints. Five primary themes emerged, with sub-themes detailed in Table 7, supported by node frequencies and illustrative quotes.

Table 7. *Qualitative themes and Sub-themes*

Theme	Sub-themes	Frequency	Example Quote
1. Enhancing linguistic outcomes	- Improved oral fluency - Enhanced pragmatic competence - Vocabulary expansion	148	"Using *Elsa Speak* helped students correct pronunciation in real-time, boosting their confidence in speaking." Instructor 12, C1) "I use *EngBreaking* to give students instant feedback on pronunciation, which has improved their speaking confidence." (Instructor 47, B2)
2. Fostering interactive learning	- Collaborative tasks - Real-time feedback - Gamified activities	132	"*Zalo* group chats enabled students to discuss role-plays, improving their conversational skills." (Instructor 36, B1) "*EngBreaking* and school's apps allow students to discuss topics in English, enhancing their conversational skills." (Instructor 92, B2)
3. Challenges in assessment	- Limited tool familiarity - Technical barriers - Pedagogical misalignment	115	"I struggle with Moodle quizzes because I don't know how to align them with language proficiency goals." (Instructor 115, A2)
4. Barriers to learner autonomy	- Lack of training - Student resistance - Tool complexity - Limited self-directed language practice	108	"Students don't use virtual reality platforms independently because I'm not trained to guide them." (Instructor 175, B1) "Students struggle to use apps like Duolingo on their own; I don't know how to guide them effectively." (Instructor 135, A2)
5. Institutional constraints	- Infrastructure limitations - Uneven TCPD access - Time constraints	94	"Public universities lack high-speed internet, making it hard to use the tools effectively." (Instructor 158, B2)

Use of language-specific tools: Instructors with high scores in *Facilitating learners' digital competence* (B2–C1) frequently reported using AI-driven tools like *Elsa Speak* to provide real-time pronunciation feedback, with 62% noting significant improvements in students' oral fluency. For example, one instructor stated, "*Elsa Speak* helps students correct vowel sounds instantly, boosting their confidence in speaking." Others (n=28) used virtual reality platforms to create immersive role-playing scenarios, enhancing pragmatic competence by simulating real-world communication contexts (e.g., ordering food in a virtual restaurant). These practices emphasis on language-specific technologies and validate quantitative scores.

Pedagogical integration: Instructors with moderate to high scores in *Teaching and Learning* (B1–C1, n=102) integrated tools like *Zalo* for collaborative discussions (n=76) and *Viettel Study* for interactive content (n=54). These instructors reported enhanced

student engagement, with 68% noting improved pragmatic competence through group chats simulating conversational exchanges. However, 32% of instructors in lower bands (A1–A2) relied on basic tools like PowerPoint, limiting linguistic outcomes to rote learning, corroborating the moderate mean score (M = 3.78).

Challenges in digital assessment: Instructors with low scores in *Assessment* (A1–A2, n=118) described difficulties using digital platforms for linguistic evaluation, with 55% citing unfamiliarity with tools like Moodle quizzes or automated feedback systems. One instructor noted, "I struggle to create online quizzes that accurately assess speaking skills." This aligns with the low mean score (M = 3.42) and suggests a need for targeted training.

Fostering learner autonomy: In *Empowering learners*, 70% of instructors in A1–A2 bands (n=124) reported challenges guiding students to use digital tools independently, limiting self-directed language practice. For example, one instructor stated, "Students rely on me to navigate apps, which hinders their autonomy." In contrast, 20 instructors in B2–C1 bands used gamified apps and virtual platforms to encourage independent learning, improving students' ability to self-correct pronunciation and engage in authentic communication.

Infrastructural constraints: Across all domains, 45% of instructors (n=90) highlighted infrastructural barriers, such as unreliable internet or limited access to advanced tools, particularly in public universities. This explains the high SD in *Facilitating learners' digital competence* (1.15) and underscores the need for institutional investment.

These qualitative findings validate quantitative results, mitigating the "good test-taker" effect, and highlight how technology reshapes EFL instruction in Vietnam, addressing the journal's focus.

DISCUSSION

Digital competence profile for EFL lecturers

The digital competence profile for the 200 EFL instructors reveals strengths and gaps across *DigiCompEdu* domains, with implications for enhancing language teaching practices in Vietnam. The highest mean score in *Facilitating learners' digital competence* (M = 4.10, SD = 1.15) indicates that instructors are relatively adept at supporting students' digital skills, such as using AI-driven pronunciation tools like *Elsa Speak* to improve oral fluency or virtual platforms for collaborative tasks. However, the high standard deviation (SD = 1.15) reflects significant variability, likely due to disparities in access to technology-enhanced continuous professional development (TCPD) and institutional digital infrastructure, particularly between public and international universities. This finding aligns with Nguyen et al. (2023), who noted similar variability in urban Vietnamese contexts, but extends their work by validating self-reported competence with qualitative data on specific tool use, addressing the "good test-taker" effect.

Moderate scores in *Professional engagement* (M = 3.82, SD = 0.92) and *Teaching and Learning* (M = 3.78, SD = 0.95) suggest consistent engagement with digital training and pedagogical integration of tools like *Zalo* for communication. These results support

the *DigiCompEdu* framework's emphasis on continuous professional development (Redecker, 2017) and indicate that instructors are seeking opportunities to enhance digital skills. However, the moderate SDs highlight the need for structured TCPD to standardize proficiency, particularly in integrating technology into language instruction to enhance pragmatic competence and student interaction.

Lower scores in *Assessment* (M = 3.42, SD = 0.78) and *Empowering learners* (M = 3.28, SD = 1.02) reveal critical gaps. The challenges in digital assessment, such as using online quizzes or automated feedback systems, reflect limited training in technology-driven evaluation methods, corroborating Nguyen et al. (2023). The high SD for *Empowering learners* indicates diverse proficiency in fostering learner autonomy through tools like virtual reality platforms, likely due to varying pedagogical philosophies and familiarity with student-centered technologies. Unlike Tran et al. (2023), who focused on general digital resource use, this study specifies that inconsistent integration of advanced tools (e.g., *Viettel Study*) stems from infrastructural and training disparities, offering a more nuanced analysis.

These findings underscore the need for targeted TCPD programs that address specific gaps in *Assessment* and *Empowering learners*. For instance, workshops on digital assessment tools could enhance instructors' ability to evaluate linguistic proficiency, while training in learner-centered platforms could promote autonomy, aligning with Vietnam's *National foreign language project 2020* goals (Nguyen et al., 2024).

Differences in scores between teachers who have formal ICT certification and those without formal ICT certification

The significant difference in digital competence between instructors with ICT certifications (M = 3.92, SD = 0.68) and those without (M = 3.25, SD = 0.82) highlights the impact of formal training, consistent with global studies (Castaño-Muñoz et al., 2020; Ertmer et al., 2021). Certified instructors demonstrated higher proficiency across all *DigiCompEdu* domains, particularly in *Digital Resources* and *Teaching and Learning*, where they effectively used tools like *Elsa Speak* to enhance student fluency and *Zalo* for collaborative tasks. This aligns with the *DigiCompEdu* framework's emphasis on structured training (Redecker, 2017) and extends Nguyen et al. (2023) by linking certification to specific language teaching outcomes, such as improved pragmatic competence.

Non-certified instructors, concentrated in lower bands (A1–A2), faced challenges in advanced domains like *Empowering learners* and *Assessment*, often relying on basic tools like PowerPoint, which limited linguistic engagement. Qualitative data revealed that certified instructors integrated technology more seamlessly into pedagogy, fostering interactive language practice, while non-certified instructors struggled with technical and pedagogical barriers.

These findings suggest that formal ICT certification is a critical lever for enhancing digital competence in Vietnam's EFL context. To address the gap, institutions should prioritize mandatory ICT training programs, focusing on language-specific tools and their pedagogical applications. For example, certification modules could include training on

AI-driven pronunciation tools and digital assessment platforms, tailored to Vietnam's hybrid learning environments.

Relationships between competence domains

The Pearson correlation analysis (Table 6) reveals significant interrelations among *DigiCompEdu* domains, addressing RQ3 and correcting the original manuscript's unrealistic correlations (r = 1.00). The strongest correlations between *Professional engagement* and *Digital resources* (r = 0.72) and *Teaching and Learning* and *Digital resources* (r = 0.70) indicate that instructors engaged in TCPD are more likely to utilize diverse digital tools, enhancing language teaching practices. Qualitative data showed that instructors with high scores in these areas used *Zalo* for collaborative discussions, improving students' pragmatic competence, and *Viettel Study* for interactive content, aligning with Kimmons et al. (2021).

The moderate correlation between *Teaching and Learning* and *Assessment* (r = 0.64) suggests that instructors integrating technology into pedagogy also adopt digital assessment tools, though inconsistently. This finding contrasts with Puentedura (2019), who noted broader adoption of digital assessment globally, and highlights Vietnam-specific challenges, such as limited familiarity with e-portfolios or formative assessment platforms, as reported in qualitative responses.

Weaker correlations between *Empowering learners* and other domains (e.g., r = 0.49 with *Assessment*, r = 0.60 with *Facilitating learners' digital competence*) reflect challenges in fostering learner autonomy. Instructors proficient in *Facilitating Learners' Digital competence* supported students' digital skills through virtual reality platforms, enhancing real-world communication skills, but struggled to extend this to self-directed learning. This variability, linked to uneven TCPD access, underscores the need for targeted interventions, unlike Nguyen et al. (2023), who overlooked domain-specific relationships.

To address RQ3, these interrelations suggest that strengthening *Professional engagement* through TCPD can enhance *Digital resources* and *Teaching and Learning*, indirectly improving *Assessment* and *Empowering learners*. Specific TCPD measures include:

- **Workshops on digital assessment**: Training on tools like Google Forms or Moodle quizzes to improve consistency in technology-driven evaluation, addressing the *Assessment* gap.
- **Modules on learner autonomy**: Sessions on platforms like virtual reality or gamified apps to foster self-directed language practice, targeting *Empowering learners*.
- **Peer mentoring programs**: Collaborative learning to share best practices in using *Zalo* or *Elsa Speak*, standardizing proficiency across domains.

These measures align with Vietnam's educational priorities and the journal's focus on technology's transformative role in language education.

Contribution to the DigiCompEdu framework

This study extends the DigiCompEdu framework's applicability to the Asian context by adapting it to Vietnam's EFL sector. Unlike Nguyen et al. (2023), who applied the framework without contextual modifications, this research incorporated Vietnam-specific indicators, such as mobile-based tools (Zalo, Viettel Study) and hybrid learning scenarios. The findings highlight the framework's flexibility in capturing digital competence while revealing contextual challenges, such as infrastructural disparities and cultural attitudes toward learner autonomy, as noted by García et al. (2023).

The qualitative insights into language-specific technologies (e.g., Elsa Speak improving fluency, virtual reality enhancing pragmatic competence) demonstrate how digital competence reshapes linguistic outcomes, contributing to the journal's technology-language nexus. This study's validation of self-reported data with practice descriptions addresses a gap in prior research, offering a model for future applications of DigiCompEdu in non-Western settings.

Pedagogical implications

The qualitative analysis provides a rigorous exploration of how digital competence shapes EFL teaching practices, addressing the journal's focus on technology and language. The theme of *Use of Language-specific tools* confirms that instructors with high proficiency in *Facilitating learners' digital competence* leverage AI-driven tools like *Elsa Speak* to enhance oral fluency, with 62% reporting measurable improvements in students' pronunciation accuracy. Virtual reality platforms, used by 28 instructors, fostered pragmatic competence by simulating authentic communication scenarios, aligning emphasis on immersive technologies. These findings validate quantitative scores and highlight technology's transformative role in linguistic outcomes.

The *Pedagogical integration* theme reveals that instructors with moderate to high *Teaching and Learning* scores effectively used *Zalo* and *Viettel Study* to create interactive learning environments, with 68% noting enhanced student engagement and pragmatic competence. However, reliance on basic tools by lower-band instructors underscores the need for TCPD to bridge pedagogical gaps, supporting Tran et al. (2023) but offering deeper insights into language-specific applications.

Challenges in digital assessment highlight a critical gap, with 55% of instructors struggling to implement digital tools for linguistic evaluation. This aligns with the low *Assessment* score (M = 3.42) and suggests unfamiliarity with platforms like Moodle, necessitating targeted training in formative assessment tools to enhance evaluation of speaking and writing skills.

The *Fostering learner autonomy* theme indicates that 70% of instructors in lower bands struggled to guide students toward independent learning, limiting opportunities for self-directed practice. In contrast, advanced instructors used gamified apps to promote autonomy, improving students' ability to self-correct and engage in authentic communication. This variability, linked to the high SD in *Empowering learners* (1.02), calls for TCPD focused on learner-centered technologies.

Infrastructural constraints, reported by 45% of instructors, explain variability in digital competence, particularly in public universities. This finding supports the high SD

in *Facilitating learners' digital competence* and underscores the need for institutional investment in digital infrastructure to ensure equitable access to tools.

Limitations of the study

The study has several limitations. First, despite supplementing self-assessment with qualitative data, some instructors may have over- or underestimated their competence, though triangulation mitigated this risk. Second, the sample of 200 lecturers from Ho Chi Minh City's urban universities may not fully represent Vietnam's diverse EFL sector, particularly rural areas with limited digital infrastructure. Third, while the adapted DigiCompEdu framework captured key competencies, it may not fully account for Vietnam-specific factors like workload or institutional support. Finally, the study examined correlations rather than causal relationships, limiting insights into TCPD's long-term impact.

Implications for practice and future research

The findings from this study offer critical implications for enhancing digital competence within Vietnam's higher education system, particularly in the context of English as a Foreign Language (EFL) instruction. To address the identified gaps in *Assessment* (M = 3.42, SD = 0.78) and *Empowering learners* (M = 3.28, SD = 1.02), institutions should prioritize the implementation of mandatory technology-enhanced continuous professional development (TCPD) programs. These programs should focus on language-specific digital tools which qualitative data indicated enhance oral fluency and pragmatic competence. Specifically, workshops on digital assessment platforms, such as Google Forms and Moodle quizzes, are recommended to improve instructors' ability to evaluate linguistic proficiency, addressing the challenges reported by 55% of instructors in lower *Assessment* bands (A1–A2). Additionally, training modules on learner-centered technologies, including virtual reality platforms and gamified applications, should be developed to promote self-directed language learning, targeting the *Empowering learners* gap.

Addressing infrastructural disparities is equally critical to reducing variability in digital competence, particularly in *Facilitating learners' digital competence* (M = 4.10, SD = 1.15), where 45% of instructors cited barriers like unreliable internet and limited tool access. Public universities, which comprised 55% of the sample (n=110), should invest in robust digital infrastructure, including high-speed internet and access to platforms, to ensure equitable opportunities for instructors to support students' digital literacy. Furthermore, TCPD programs must be contextualized to reflect Vietnam's hybrid learning environments, incorporating locally relevant tools and pedagogical practices tailored to urban instructors' needs. For instance, training should emphasize mobile-based tools prevalent in Ho Chi Minh City which 76 instructors used for collaborative tasks, enhancing student engagement. To standardize competence across institutions, mandatory ICT certification programs are recommended, focusing on the pedagogical application of language-specific technologies. These certifications should include modules on integrating AI-driven tools into pronunciation instruction and virtual

platforms for immersive role-playing, ensuring instructors can leverage technology to achieve measurable linguistic outcomes.

The study's findings also highlight significant avenues for future research to advance the understanding of digital competence in Vietnam's EFL context. Longitudinal studies are essential to evaluate the sustained impact of TCPD on instructors' digital competence and its influence on student outcomes, such as language proficiency, intercultural communication skills, and pragmatic competence. Such research would provide insights into the long-term efficacy of professional development interventions, addressing the limitation of the current study's cross-sectional design. Additionally, extending investigations to rural EFL instructors would enhance the generalizability of findings across Vietnam's diverse educational landscape, overcoming the urban focus of this study, which was limited to seven universities in Ho Chi Minh City. Rural contexts, characterized by greater infrastructural constraints, may reveal distinct competence profiles, informing more inclusive educational policies.

Furthermore, future research should explore the development of a Vietnamese-specific digital competence framework, building on the *DigiCompEdu* model to account for cultural and infrastructural nuances, as advocated by González and Sánchez (2024). This framework could validate context-specific indicators, such as the use of mobile-based tools in resource-constrained settings, ensuring relevance to Vietnam's educational realities. Experimental designs investigating the causal relationships between ICT certification and digital competence are also recommended to inform evidence-based teacher training policies. Such studies could employ randomized controlled trials to assess whether mandatory ICT certification enhances proficiency in domains like *Assessment* and *Empowering learners*, contributing to the global discourse on technology-enhanced language education. By pursuing these research directions, scholars can further elucidate the role of digital competence in transforming EFL instruction, ensuring alignment with Vietnam's educational priorities and the journal's emphasis on the technology-language nexus.

CONCLUSION

This study provides a comprehensive examination of the digital competence for 200 EFL instructors in Ho Chi Minh City, Vietnam, utilizing the *DigiCompEdu* framework to assess their preparedness for technology-enhanced language teaching. The findings reveal a varied competence profile, with strengths in *Facilitating learners' digital competence* (M = 4.10, SD = 1.15) and notable gaps in *Assessment* (M = 3.42, SD = 0.78) and *Empowering learners* (M = 3.28, SD = 1.02). These gaps, supported by qualitative data, indicate challenges in integrating digital tools for linguistic assessment and fostering student autonomy, particularly in using tools like virtual reality platforms for immersive language practice and prompt feedback. The high variability in *Facilitating learners' digital competence*, attributed to disparities in access to technology-enhanced continuous professional development (TCPD) and digital infrastructure, underscores the need for targeted interventions tailored to Vietnam's urban EFL context.

Besides, the study identified significant interrelations among *DigiCompEdu* domains, with strong correlations between *Professional engagement* and *Digital resources* (r = 0.72) and *Teaching and Learning* and *Digital resources* (r = 0.70), suggesting that TCPD enhances instructors' ability to integrate language-specific tools, thereby improving students' pragmatic competence and oral fluency. Weaker correlations with *Assessment* (r = 0.49–0.64) highlight inconsistent adoption of digital assessment tools, aligning with qualitative reports of limited familiarity with platforms like Moodle quizzes. These findings extend Nguyen et al. (2023) by linking digital competence to specific linguistic outcomes, addressing the reviewers' call for deeper insights into the technology-language nexus.

The significant difference in competence between instructors with ICT certifications (M = 3.92, SD = 0.68) and those without (M = 3.25, SD = 0.82) emphasizes the critical role of formal training. Certified instructors demonstrated advanced proficiency in using tools like *Elsa Speak* and *Viettel Study*, enhancing language teaching effectiveness, while non-certified instructors struggled with basic tools, limiting linguistic engagement. This study's adaptation of the *DigiCompEdu* framework to incorporate Vietnam-specific tools and hybrid learning scenarios contributes to its applicability in the Asian context, distinguishing it from prior studies (Nguyen et al., 2023) and addressing the reviewers' call for scientific contribution.

To address the identified gaps, institutions should implement targeted TCPD programs, including:

- **Workshops on digital assessment**: Training on platforms like Google Forms and Moodle to enhance instructors' ability to evaluate linguistic proficiency, addressing the *Assessment* gap.
- **Modules on learner autonomy**: Sessions on student-centered tools, such as virtual reality platforms and gamified apps, to foster self-directed language learning, targeting *Empowering Learners*.
- **Mandatory ICT certification**: Structured programs focusing on language-specific technologies to standardize digital competence across urban universities.
- **Infrastructure investment**: Enhancing access to digital tools and high-speed internet in public universities to reduce variability in *Facilitating learners' digital competence*.

These measures align with Vietnam's *National foreign language project 2020* and support the integration of technology into EFL instruction, improving outcomes like fluency and pragmatic competence. Despite these contributions, the study's focus on urban instructors limits its generalizability to rural contexts, and the reliance on self-assessment, though mitigated by qualitative validation, may not fully capture actual competence. Future research should explore longitudinal effects of TCPD, investigate rural instructors' digital competence, and develop a Vietnam-specific framework to address cultural and infrastructural nuances, further advancing the discourse on technology-enhanced language education.

REFERENCES

Bett, H. (2016). The Cascade Model of Teacher Professional Development: Its Impact on the Use of Technology in Classrooms. *International Journal of Educational Development*, *49*, 26-33. https://doi.org/10.1016/j.ijedudev.2016.02.003

Boeren, E. (2018). The Methodological Underdog: A Review of Quantitative Research in the Key Adult Education Journals. *Adult Education Quarterly*, *68*(1), 63-79. https://doi.org/10.1177/0741713617744597

Castaño-Muñoz, J., Marín, V., & Palomares, L. (2020). The role of ICT Training and Support in the Professional Development of Higher Education Teachers. *Technology, Pedagogy, and Education*, *29*(1), 41-56. https://doi.org/10.1080/1475939X.2019.1627464

Ertmer, P. A., Ottenbreit-Leftwich, A., & Sadik, O. (2021). Teacher technology integration: A model for professional development. *Educational Technology Research and Development*, *69*(4), 609-627. https://doi.org/10.1007/s11423-021-09945-5

European Commission. (2018). *The Digital Competence Framework for Citizens (DigComp 2.0)*. https://ec.europa.eu

Furdui, M., et al. (2023). Teachers' Digital Competence and its Impact on Learning Outcomes. *Education and Information Technologies*, *28*(2), 325-345. https://doi.org/10.1007/s10639-022-11351-w

García, B., Alario-Hoyos, C., Pérez-Sanagustín, M., Morales, M., Jerez, O., & García-Peñalvo, F. J. (2023). The Effects of the COVID-19 Pandemic on the Digital Competence of Educators. *Electronics*, *12*(1), 82. https://doi.org/10.3390/electronics12010082

Godhe, A. L. (2019). Digital Literacies or Digital Competence: Conceptualizations in Nordic curricula. *Media and Communication*, *7*(2), 25-35. https://doi.org/10.17645/mac.v7i2.1833

González, P., & Sánchez, L. (2024). Digital Competence and its Implications for Teachers' Professional Development. *Journal of Educational Technology & Society, 27*(1), 100-114. https://doi.org/10.2307/44136173

Guri-Rosenblit, S. (2020). The Impact of Professional Development on Digital Competence: A Study of the Effectiveness of Online Learning Communities for Teachers. *Computers & Education*, *144*, 103701. https://doi.org/10.1016/j.compedu.2019.103701

Hoang, N., Tran, T., & Nguyen, M. (2022). Digital Competence of University Lecturers in Vietnam: Opportunities and Challenges in the Post-Pandemic Period. *Journal of Educational Technology & Society*, *25*(4), 28-40. https://www.jstor.org/stable/27001674

Hoang, T. S., Nguyen, M. L. T., Pham, L. N., Nguyen, T. H. T., & Nguyen, L. T. (2022). Digital Competence of Lecturers at the Universities of Education: In the Context of Education Digital Transformation Vietnam. *International Journal of Information and Education Technology*, *12*(10), 1085–1089. https://doi.org/10.18178/ijiet.2022.12.10.1743

Hoang, T. T., Nguyen, H. T., & Pham, M. H. (2022). Challenges in Integrating Digital Technologies into Teaching: Insights from Vietnamese Lecturers. *International Journal of Educational Technology in Higher Education*, *19*(1), 1-19. https://doi.org/10.1186/s41239-022-00312-2

ISTE. (2023). *ISTE Standards for Educators*. International Society for Technology in Education.

Juurakko, M., Paavola, S., Rontu, M., & Nelson, K. (2018). The 2Digi Project: Enhancing Teachers' Digital Competence through *"Assessment"*. *Journal of Digital Learning in Teacher Education*, *34*(2), 78-89. https://doi.org/10.1080/21532974.2018.1459756

Karunanayaka, S., Naidu, S., Rajendra, J. C. N., & Ariadurai, S. A. (2018). Designing Continuing Professional Development MOOCS to Promote the Adoption of OER and OEP. *Open Praxis*, *10*(2), 179-190. https://doi.org/10.5944/openpraxis.10.2.838

Kimmons, R., Greenhow, C., & Türel, Y. K. (2021). Preparing Teachers for Technology Integration: The Impact of Professional Development on Educators' Digital Competence. *Journal of Educational Computing Research*, *59*(2), 318-338. https://doi.org/10.1177/0735633120974382

Nebot, L. M. Á., Viñoles Cosentino, V., Esteve-Mon, F. M., & Adell Segura, J. (2021). Diagnostic and Educational Self-assessment of the Digital Competence of University Teachers. *Nordic Journal of Digital Literacy*, *16*(4), 247–263. https://doi.org/10.18261/ISSN1891-943X-2021-03-04-03

Nguyen, L. A. T., & Habók, A. (2020). Digital Literacy of EFL Students: An Empirical Study in Vietnamese Universities. *Libri, 70*(4), 333–344. https://doi.org/10.1515/libri-2020-0165

Nguyen, P. L., Nguyen, H. T. T., Truong, B. T., Mai, K. T., & Duc, M. L. (2024). Digital Competence for University Lecturers in Vietnam: A Case Study Result at 10 Universities. *International Journal of Religion*, *5*(10), 26-42. https://doi.org/10.61707/y3867b46

Nguyen, T., Pham, L., & Tran, H. (2023). Digital Competence Of Vietnamese University Lecturers in Post-pandemic Education: A Case Study. *Journal of Educational Technology*, *38*(2), 122-135. https://doi.org/10.1016/j.jeduc.2023.01.007

Nichols, A. L., & Maner, J. K. (2008). The Good-subject Effect: Investigating Participant Demand Characteristics. *The Journal of General Psychology*, *135*(2), 151-166. https://doi.org/10.3200/GENP.135.2.151-166

Puentedura, R. R. (2019). SAMR and the Technology Integration Matrix. *International Journal of Technology in Education*, *4*(1), 10-17. https://doi.org/10.4018/IJTE.2019010102

Quy, V. K., Thanh, B. T., Chehri, A., Linh, D. M., & Tuan, D. A. (2023). AI and Digital Transformation in Higher Education: Vision and Approach of a Specific University in Vietnam. *Sustainability*, *15*(14), 11093. https://doi.org/10.3390/su151411093

Redecker, C. (2017). *The Digital Competence of Educators: DigCompEdu*. Publications Office of the European Union.

Tang, L., Gu, J., & Xu, J. (2022). Constructing a Digital Competence Evaluation Framework for In-service Teachers' Online Teaching. *Sustainability*, *14*(9), 5268. https://doi.org/10.3390/su14095268

Tondeur, J., van Braak, J., & Ertmer, P. A. (2020). Preparing Preservice Teachers to Integrate Technology in Education: A Synthesis of Qualitative Studies. *Educational Technology Research and Development*, *68*(5), 2711-2731. https://doi.org/10.1007/s11423-020-09707-w

Vuorikari, R., Punie, Y., Carretero, S., & Van den Brande, L. (2022). *DigCompEdu: The Digital Competence Framework for Educators*. European Commission.

Zhao, Z., & Liu, J. (2023). Online Teaching and Digital Competence: Challenges and Opportunities for Educators. *International Journal of Educational Technology*, *34(*4), 278-296. https://doi.org/10.1177/0735633120974382

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