Digital Literacy and Digital Competence among EFL Teachers: A Systematic Literature Review

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Article Info	Abstract
	Research on digital literacy and digital competence in English teacher education has expanded substantially over the past decade, reflecting growing scholarly attention to teachers' roles in digitally mediated learning environments. This study systematically maps publication trends, collaboration patterns, and thematic emphases in this research domain, identifying how digital literacy and digital competence are conceptualized and empirically addressed. A Systematic Literature Review (SLR) was conducted following the PRISMA framework, drawing on Scopus-indexed publications from 2015 to 2025. Bibliometric analysis examined publication growth, co-authorship networks, country contributions, and keyword co-occurrences, complemented by thematic synthesis to interpret conceptual and pedagogical patterns. VOSviewer was used to visualize bibliometric linkages. Findings indicate steady publication growth with limited international collaboration and regional concentration, particularly in Southeast Asia. Thematic synthesis reveals that digital literacy is commonly framed as foundational skills that include information access, communication, and basic technology use, while digital competence emphasizes pedagogical integration, professional development, and context-responsive teaching. Advanced aspects such as AI-supported pedagogy, critical digital engagement, and transformative digital practices remain less explored. Overall, both constructs are central in English teacher education but are addressed with varying conceptual depth.

INTRODUCTION

Digital competence is one of the eight basic key competencies identified by the European Commission necessary for lifelong learning (Lopes et al., 2023; Méndez et al., 2023; Morte-Nadal & Esteban-Navarro, 2022). This is an indication that, as the world continues to embrace technology and our society evolves, there will be a need for digital literacy as well. The framework is dynamic, with updates at regular intervals to ensure it remains relevant in keeping with the pace of technological advancements and societal needs (Capogna & Scarozza, 2023; Vuorikari et al., 2022; Zhao et al., 2021). DigComp is a structural guideline for a comprehensive framework in digital education and training. As per the research studies conducted by Skantz-Åberg (2022), Tagirovna (2022), and Lindfors (2021), it has been discussed that digital competence is placed alongside other key areas of competence, such as communication in foreign languages, basic understanding of

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science, technology, education, and social, as well as an understanding of initiative and entrepreneurship. All these competencies combined provide a holistic foundation that helps individuals in their personal, social, and professional lives. The terms digital competence and digital literacy are often used interchangeably in policy and research literature. Digital literacy provides a wider and more holistic view (Holm, 2024; Mattar, Ramos, et al., 2022; Tinmaz et al., 2022). Digital literacy requires the ability to interpret digital information, assess the reliability of online sources, and make use of digital technology in a way that demonstrates an awareness of their social, cultural, and political contexts (Ilmi et al., 2022; Mattar, Santos, et al., 2022; Vaskov et al., 2021). Digital literacy extends the concept of digital competence to a more comprehensive awareness of the digital landscape and the way we interact with it.

Significantly, over the course of recent decades, the attention devoted to digital literacy and digital competence, as indicated through Scopus-based research, has increased considerably. There is a significant need to develop a unifying concept that will encompass these two constructs, a point that has been supported through various research studies that have indicated the interrelation of these two constructs, especially in the context of education (Carretero et al., 2017; Spante et al., 2018). Other research focused on different aspects of digital competence in different contexts of learning: formal, informal, and non-formal (Caldana et al., 2023). In addition, there have been studies on different dimensions of digital competence, for example, the digital skill set of university students (Perifanou et al., 2021). Moreover, there has been an acknowledgment of the role of organizational support for teachers in enhancing digital competence in education (Nurjanah et al., 2025; Pettersson, 2018). In general terms, the literature acknowledges digital competence as an integral part of modern education rather than a purely technological skill, being crucial for adapting to the constant digital revolution. In addition, there is already research on English teachers' digital competency, and the results show that there is a positive correlation between teaching competence and digital competence, and there is a need to better support students' digital competence (Guillen-Gamez et al., 2021; Guillén-Gámez & Mayorga-Fernández, 2022; Villar-Onrubia et al., 2022).

Although various studies have been conducted on the topic of digital competence and digital literacy in the field of education (Caldana et al., 2023; Perifanou et al., 2021), research on publication trends, such as co-authorship, keywords, and collaboration, is still limited, especially in the field of English teacher education. This is also indicated by the lack of interconnection between different research domains within the Scopus database. In addition, systematic reviews on the topic of digital literacy and digital competence among English teachers are limited. To bridge this research gap, the study applies the systematic literature review (SLR) methodology to investigate publication trends in the Scopus database, such as co-authorship, keywords, and collaboration. In the context of rapid changes in the digital world, it is essential to improve English teachers' digital literacy and competence to promote innovative teaching and learners' preparedness for the challenges of the 21st century.

The present research aims to identify the research trends on digital literacy and digital competence among English teachers using Scopus as the data source. The research aims to present an overview of the research developments in the field from 2015 to 2025 by using performance analysis and science mapping with VOSviewer. Most previous research on this topic has been descriptive in nature, discussing the competencies of teachers, but there has been a lack of comprehensive syntheses and recommendations. The present research aims to bridge this gap by providing thematic mapping on the research trends in the field and providing insights and recommendations that can help English teachers in the digital learning ecosystem, and also contribute to future research in the field. The expected outcome is to contribute to the field by identifying research hotspots, areas that have not been fully explored, and potential opportunities for further research. Therefore, this study is expected to answer two main questions: what are the publication trends concerning digital literacy and digital competence among English teachers, as indexed by the Scopus database, especially concerning co-authorship, keywords, international collaborations between countries, and co-authorship networks between institutions? Furthermore, what potential contributions and recommendations can be drawn from Scopus-indexed articles concerning digital literacy and digital competence among English teachers?

METHOD

Research Design

For this study, the PRISMA-guided systematic literature review (SLR) methodology was employed (Knobloch et al., 2011; Moher et al., 2009), which combines the use of bibliometric analysis and thematic synthesis to investigate the literature on digital literacy and digital competence in the context of English teacher education. Bibliometric analysis was used to describe the trends, co-authorship, countries, institutions, and keywords, using VOSviewer software. Thematic synthesis was conducted using the iterative process of reading and coding the articles.

Review Scope and PICOC Framework

The research design of this study also follows the PICOC approach in terms of defining the Population, Intervention, Comparison, Outcome, and Context of the systematic review (see Table 1). The PICOC approach is one of the most common tools used in evidence-based literature reviews in defining what is included or not included in the review (SampaioAlberto, 2015).

Table 1. Terms of PICOC

Component	Description
Population (P)	English teachers (pre-service and in-service)
Intervention (I)	Empirical studies addressing digital literacy and/or digital competence
Comparison (C)	Not applicable / does not apply, because the focus is on publication trends, contributions and recommendation, not intervention trials).
Outcome (O)	1) Publication trends (co-authorships, keywords, co-authorship by countries, and co-authorship organizations), 2) Contributions and recommendations for English teachers
Context (C)	Peer-reviewed journal articles indexed in the Scopus database

In this case, the key emphasis of the review for English teachers will be the Population (P), and the Intervention (I) will be an analysis of scholarly materials regarding digital literacy and digital competence as essential skills for modern educators. As the study does not entail a comparison of interventions, there will be no need for a Comparison (C). The Outcomes (O) are trends found in academic publications, including co-authorships, keywords, and collaborations in terms of countries and institutions. The Context (C) indicates the peer-reviewed publications in the Scopus database.

The Procedure of Literature Selection (PRISMA Flow)

For the literature search process, the PRISMA method was followed, which is a clear and transparent process for identifying the literature to be used for the systematic review. This process involves four steps: identification, screening, eligibility, and inclusion, keeping the search process tight to show the most recent and relevant literature. The literature selection procedure can export the results in .ris and .csv formats: (TITLE-ABS-KEY (digital AND literacy) AND TITLE-ABS-KEY (digital AND competence) AND TITLE-ABS-KEY (english AND teacher)) AND PUBYEAR > 2014 AND PUBYEAR < 2026 AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ARTS")) AND (LIMIT-TO (OA , "all")). *(Source: Advanced Query Scopus Database).*

In this step, the screening process further limited the publication year from 2015-2025 in order for the literature to be relevant for this study. Those that were unique and potentially pertinent then underwent the eligibility process, where the full texts of the literature were assessed based on predetermined criteria such as the research topic, methods used, and how well the results were presented. The studies that passed all the criteria were then used in the in-depth analysis to ensure the thoroughness of the review. As depicted in Figure 1, the PRISMA flow diagram has four phases: Identification, Screening, Eligibility, and Inclusion. From the total of 123 articles obtained from Scopus, four duplicates were eliminated, leaving 119 articles. The screening phase eliminated 64 articles, with the inclusion of the Social Sciences and Arts & Humanities domains narrowing the search to 48 articles. The eligibility phase eliminated non-peer-reviewed and non-full-length articles, leaving 22 open-access articles. The thematic analysis eliminated 11 articles that did not fit

the criteria, leaving 10 articles for analysis. Even though the number was very small (n = 10), bibliometric analysis was not entirely excluded, as it was deemed useful in the analysis.
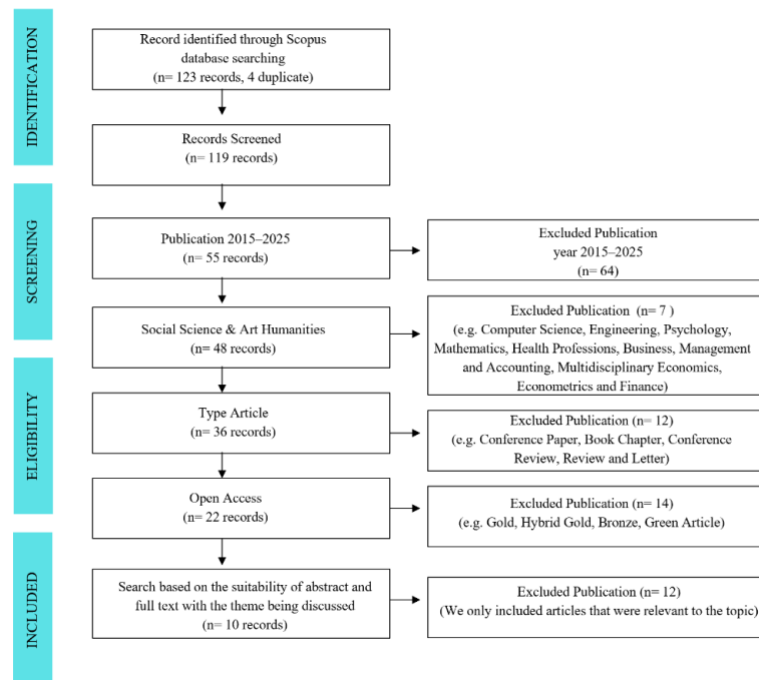

Figure 1. Flow of Article Selection in the SLR based on the PRISMA Model

RESULT AND DISCUSSION

Research Trends in Digital Literacy and Digital Competence among English Teachers

To briefly describe the collaborative research patterns within this field of study, Figure 2 shows the co-authorship publication trends related to digital literacy and digital competence among English teachers.
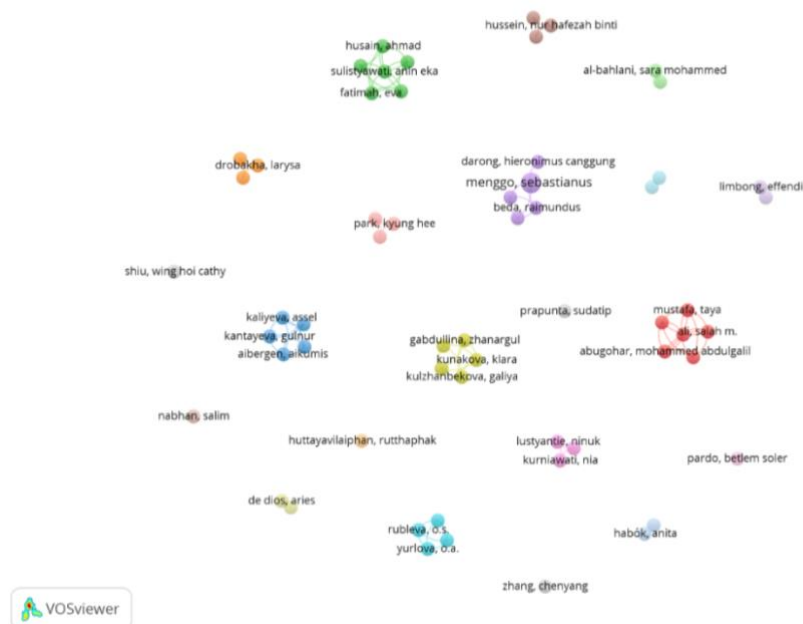

Figure 2. Publication Trends: Co-Authorship

Analysis of the collaboration network shows the presence of various author groups, which are depicted by different colors, signifying the presence of different but interlinked groups of

researchers in digital literacy and digital competence among teachers. The green group, comprising authors like Husain, Ahmad, Sulistyawati, Anin Eka, and Fatimah (Yuvita et al., 2023), signifies effective collaboration among researchers in digital technology integration in English language teaching, as suggested by Tondeur (2017) The red group, comprising authors like Ali (2023), signifies effective collaboration among researchers in training teachers on digital competence in the Middle East, as suggested by Bouaamri (2024) On the other hand, the blue group, comprising authors like Urazbayeva (2024), signifies effective collaboration among researchers in Central Asia, which emphasizes the need for localized adaptations of digital literacy (Spante et al., 2018).

Furthermore, it is interesting to note that Menggo (2023), as a node, is responsible for linking the clusters with one another, hence creating a central position within the network. A central position is also recognized as having higher levels of influence, particularly concerning research trends as well as the development of communities (Bordons et al., 2015). A central position is also recognized as having a positive impact on the dissemination of knowledge, as well as regional collaboration (Newman, 2001; Bordons et al., 2015). On the contrary, researchers such as Shiu (2024), Zhang (2021), and Jingyi (2025) have a peripheral position within this network. This is possibly due to their having a lower level of connectivity with the global network, as well as the development of new research trends, hence a reflection of lower levels of collaboration. This is also a reflection of the position of Barrot (2022) on structural barriers to collaboration in digital competitions. The above is a reflection of the collaboration structure within this particular research domain, comprising numerous nodes.

The graphic above gives a glimpse into the multi-node collaborative framework that has been adopted for this study. The results above confirm that the development of policy support for inter-cluster collaborations, inter-institutional partnerships, international research consortia, collaborative funding initiatives, and mentorship programs is essential to the development of sustainable collaborative research communities. Furthermore, as Redecker (2017) asserts, the development of a sustainable and conducive environment within which collaborative research can take place is as important as the development of policy support for the improvement of educators' digital competencies. The inclusion of other members of the network, especially the peripheral members, will add to the quality and equity of the research that is being carried out on the digital literacy of educators.
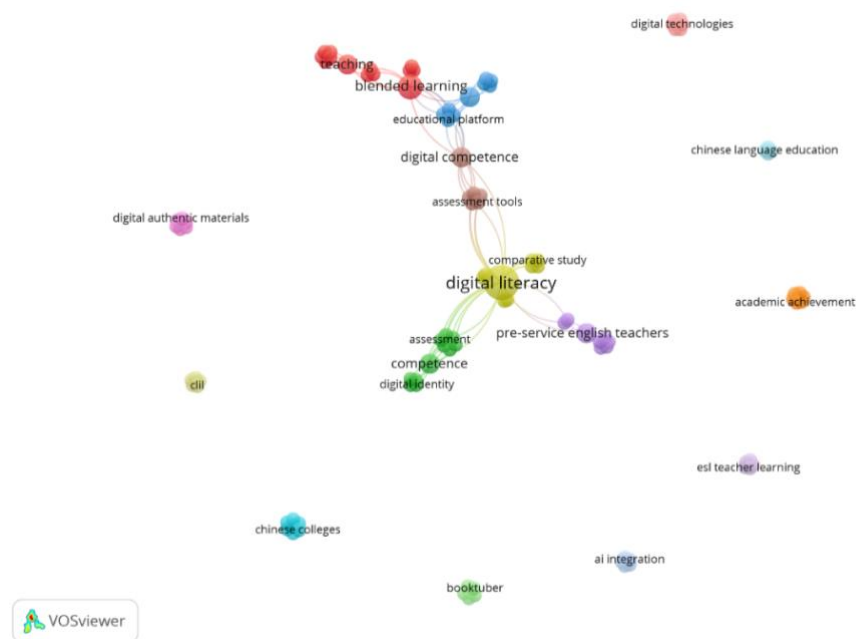

Figure 3. Publication Trends: Keywords

The landscape of digital literacy and digital competence in English language teaching is represented through the results obtained from the keyword analysis by VOSviewer. Among the keywords (see Fig. 3), "digital literacy" is found to be the most prominent and highly interconnected, highlighting its significance in influencing teachers' digital competence, digital

learning platforms, and teachers' professional development in the age of technology. This centrality is comparable to the conceptualization of digital literacy offered by Ng's (2012) that recognizes digital literacy as a multi-dimensional construct with cognitive, technical, and socio-emotional facets, which also recognizes the emerging importance of the preparedness of pre-service and in-service English language teachers. There are several clusters in the visualization. One set of keywords revolves around the concepts of competence, assessment, digital identity, and booktuber. These keywords highlight the research interests in the digital competence of individuals and the construction of teachers' digital identities in media-rich learning contexts. These keywords support the argument of Spante (2018) that digital literacy and digital competence are multidimensional concepts that overlap with each other. These keywords also support the argument of Greenhow (2009) that digital identity is a dimension of teachers' professional growth.

The existence of keyword AI integration is in line with the new trend of research in digital literacy (Holm, 2024) that has also emerged recently to explore the role of AI in education, based on which it requires developing data literacy, digital ethics, and algorithmic literacy competencies (Holm, 2024; Zawacki-Richter et al., 2019). A second set of keywords illustrating the significance of pre-service English language teachers, ESL teacher learning, and academic achievement supports a call for research regarding digital competence development and its impact on learning outcomes among pre-service teachers. These findings are consistent with other studies that highlight readiness to use technology and introduction to digital tools as key elements of successful technology experiments. (Kessler, 2018; Tondeur et al., 2017). Several more context-related keywords, including digital authentic materials, CLIL, and region-related keywords, emerge on the edges of the network, which indicate new but unexplored areas of research. These keywords reflect a shift in research focus, especially in context-related and multilingual approaches to digital literacy.

The keyword analysis, therefore, also reflects the significance of digital literacy for English teachers in direct reference to AI adoption and context-based pedagogies. Findings from the analysis contribute to an evidence base for further research and research policy, as well as for identifying gaps in a dynamic digital learning environment.

Figure 4. Publication Trends: Co-Authorship by Country

The bibliometric analysis using VOSviewer shows distinct variations in international co-authorships in SCOPUS-indexed research on digital literacy and digital competence among English teachers (see Fig 4). Indonesia also presents a high degree of research, is classified as a core node, and hence reflects a high research productivity. However, Indonesia's unique geographical location also reflects a low number of international co-authorships, as emphasized in Ika Sari's study (2024).

Conversely, integrated collaboration clusters can be identified in China, Hong Kong, Kazakhstan, and Russia, reflecting a highly developed regional research network. The level of collaboration between East Asian countries, particularly China and Hong Kong, in terms of digital education research can also be identified in the visualization map. The governments of these countries have introduced measures to promote international collaboration and align research objectives with the development of teachers' digital competencies, hence encouraging collaboration in research (Chan & Sung, 2025; Chong & Pao, 2022; Gu et al., 2023). On the contrary, a low number of collaboration nodes reflects a lack of cooperative research in Eastern European countries such as Slovakia, Hungary, and Ukraine. The lack of resources and disparate research objectives may be the cause of this (Simakhova et al., 2022). Additionally, the visualization map indicates that international cooperation is concentrated in a few areas, with lower intensity in Eastern Europe and the developing world and higher intensity in Asia and Western Europe (Gayatri et al., 2023; Yamashita et al., 2024).

Even though Indonesia is a major contributor to research output, there is still much room for Indonesia to improve its international cooperation, particularly with the established research clusters of Western Europe and Eastern Asia. Such a move would not only improve the quality and global impact of Indonesian research, as suggested by Yao (2021), but also enhance the caliber and worldwide influence of Indonesian research as well as increase its visibility and influence on digital literacy and proficiency among English teachers. As a result, Indonesian research needs to be strengthened even more in terms of cooperation with Western European and Eastern Asian research clusters.
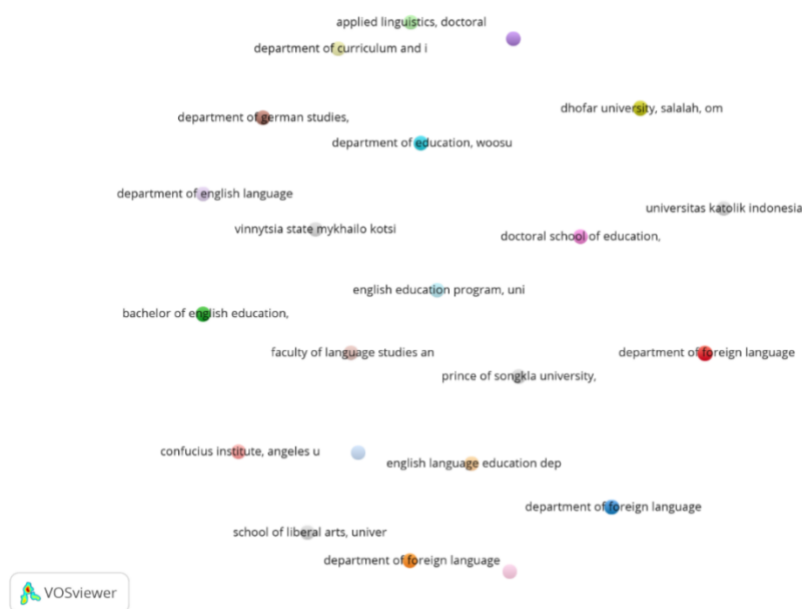

Figure 5. Publication Trends: Co-Authorship Organization

From the analysis carried out using the VOSviewer tool (see Fig. 5), it is evident that the pattern of co-authorship among the institutions that publish on the topic of digital literacy and digital competence in the field of English language education is fragmented. This is because the collaboration network comprises several small clusters, and there is strong collaboration within the clusters but minimal collaboration across the clusters. This can be attributed to the publication trends in the field, especially the minimal collaboration between developed and developing countries.

Several institutions, such as foreign language departments and English education programs, as represented by the size of the nodes in the network diagram above, are central to the network. These institutions act as innovation centers for pedagogical and technological advancements, enabling joint publications and the sharing of best practices in digital literacy/competence. Nevertheless, the improvement of EFL teacher digital literacy is not only dependent on institutional collaboration but is also subject to various contextual and individual factors related to attitudes towards technology, digital competence, and resource availability (C. Zhang, 2021; J. Zhang, 2023).

Infrastructure- and institutions' support-related problems gradually undermine teachers' digital competence, in particular their ability to integrate technology (Priyantin & Herawati, 2023).

Theoretical models (e.g., TPACK, DigCompEdu, UNESCO ICT-CFT) are essential for bridging digital literacy with pedagogical practices (Tomczyk, 2024), while Digital Competence is a comprehensive construct that encompasses technical, pedagogical, and social dimensions of digital literacy (Bahrani, 2023). The network also includes such international institutions as Vinnytsia State Mykhailo Kotsiubynskyi University, Prince of Songkla University, the Confucius Institute, Angeles University, and Dhofar University; this feature highlights the global significance of digital literacy research in language teaching. However, the small number of respondents from Southeast Asia and the Middle East highlights the opportunity for further network development in these areas.

In conclusion, the findings of this analysis indicate that collaboration in this field remains naïve, with little cross-cluster and cross-national collaboration. It is the reason why it is important to promote international cooperation in that area, notably through the coordination of research activities, scientific events, and mobility of researchers. Network centrality institutions play an active role in collaboration nodes and encourage English teachers to share knowledge more rationally, and even contribute to the overall development of digital competence in the field. The current research aims to contribute to the understanding of global research patterns in digital literacy and digital competence and emphasizes the significance of collaboration environments, policies, and frameworks such as DigCompEdu and TPACK. Future studies should focus on the dynamics of collaboration networks over time, investigate less-represented regions, and focus on new topics such as AI in language learning, digital anxiety, and equal access to digital infrastructure to further promote English teacher development in the digital age.

Contributions and Recommendations are Drawn from Scopus-Indexed Studies

The first Yuvita (2023) compares the digital literacy skills of pre-service English teachers in Thailand and Indonesia and demonstrates how curriculum, institutional, and cultural factors affect the growth of digital skills. The findings reveal a common pattern in both contexts: despite the participants' intermediate degree of digital literacy, they are most proficient in communication and teamwork, whereas they are least proficient in content production and problem-solving.

When considered together with other studies in this review, these findings suggest a systemic problem in teacher education programs in developing countries. Pre-service teachers usually have basic operational skills, but they lack higher-order abilities in pedagogical integration and creative digital production. This supports earlier research showing that proficiency with digital technology does not always translate into successful teaching(Hatlevik et al., 2015; Tondeur et al., 2012). This study also highlights the significance of incorporating technology into pedagogy as a holistic skill rather than a discrete skill in and of itself, which is in line with the TPACK framework (Koehler et al., 2013). Similar findings have also been established in a study by Munthe (2017), who argues for the inclusion of digital pedagogy courses in teacher education for English teachers, with findings that are quite similar to this study.

The main contribution of this study is that it is a cross-cultural comparative study that focuses on the role of institutional curricula and education policies in developing digital competence in Indonesia and Thailand. Yuvita et al. (2023) highlight the need to adapt the global digital literacy model to incorporate cultural differences, thus contributing to the validation of the tool outside Europe through the use of the DigCompEdu tool in Southeast Asia. In addition, this study contributes to the validation of the DigCompEdu tool. The findings of this study show that the DigCompEdu tool can be used across different cultures, as seen in this study, which used the tool in Southeast Asia, and highlights the need to adapt the global digital literacy model to incorporate cultural differences.

The second Shiu (2024) explores the professional and cognitive aspects of Hong Kong's primary English teachers in response to the challenges of emergency online teaching in the post-COVID-19 pandemic. The study conceptualizes teachers' learning as moving along a continuum from "surviving" to "thriving" and attempts to contribute to the body of knowledge about teachers' cognitive processes during emergencies. The research aims to further expound on how teachers respond to the challenges that come with emergency online teaching, as well as how they work to

improve teaching practice. The research stands out from other works on teacher cognition in emergency online teaching situations, as this research considers responses beyond those that pertain to preparation and technology issues (Bozkurt et al., 2020; Trust & Whalen, 2020). The study by Shiu focuses on teachers' cognitive and professional changes during emergency online teaching. This distinction between surviving and thriving teachers creates a unique framework of analysis for teachers' coping with the challenges of emergency online teaching.

Moreover, this two-pathway model creates further insight into teachers' heterogeneity, as it is clear that teachers' adaptation to online teaching is not absolute, but rather depends on teachers' pre-existing beliefs, as well as on teachers' and schools' environments. Sociocultural theories of teacher learning, which highlight the complex interplay between context and cognition, are supported and extended by the results of the current study (Sun & Zhang, 2021; Zhan & Jiang, 2021). The social and dynamic nature of teacher learning is evident in the current study, where educators are shown to be actively involved in forms of reflective learning, exploration of digital technologies, and peer support. While the results of the current study contradict previous research, which has largely employed technology integration models such as TPACK (Koehler et al., 2013). The use of a sociocultural perspective in the current study offers a more refined understanding of teacher learning in crisis environments.

Besides, the focus on primary-level teachers in a non-Western, urban Asian setting helps to fill the gap in the literature, as most research on teachers' digital competencies has been conducted on the secondary and tertiary levels in Western contexts (Heine & König, 2025; König et al., 2020). It is recommended that teachers in schools should be provided with professional development opportunities that not only include digital competencies but also encompass reflective, collaborative, and adaptable teaching practices. The support systems for English teachers should also include differentiation between teachers who still require survival mode support and teachers who are already in the innovation stage. Thus, this research contributes to the literature in a unique way by tracing the cognitive and professional pathways of teachers in the midst of a global crisis, providing a deeper understanding of crisis as an agent of both pedagogical struggle and transformation.

Suharni (2024) explores how English teachers make sense of, negotiate, and resist intercultural concepts in their local sociocultural and religious settings. The authors' work reveals teachers' active agency in developing intercultural literacy. The findings of the authors challenge the notion that Western-centric approaches to intercultural literacy are universally applicable. Rather, their findings corroborate the idea that, particularly in non-Western and multilingual contexts, intercultural education is intricately linked to local histories, identities, and value systems. Context-sensitive and reflective pedagogies appear to be more successful methods for fostering intercultural literacy in a classroom setting, according to the findings compiled from other studies in this article. Teachers are more likely to establish spaces for genuine intercultural engagement if they critically reflect on the connection between intercultural literacy, professional identity, and practice.

The importance of the study is its unique contribution to the field by focusing on the Malaysian teachers' stories and using a narrative approach, which is different from the more popular competency and quantitative approaches used in the field (Deardorff, 2006). Additionally, Byram's intercultural communicative competence (Byram, 2020) and other Western models are different from the study. Based on its sociocultural, national, and religious identity constructs in a pluralistic and Islamic society, Saidi (2024) highlighted conceptualizations specific to Malaysia. Additionally, the study extends Holliday's concept of "small culture" to demonstrate how various layers of identity intersect in intercultural communication (Holliday, 2018) and supports other critical studies that contest the ideological presumptions of global English and intercultural education (Kubota & Angel MY Lin, 2009). Moreover, the research emphasizes the need for ELT curricula and teachers' training programs to consider realities at both local and global levels, non-Western epistemologies, and critical intercultural reflections. It has been suggested that a dialogic, contextual, and dynamic interculturality should be promoted in ELT curricula and teachers' training programs, replacing the existing one-size-fits-all approach. The study calls on the ELT community to reevaluate how it views intercultural literacy as a static concept and instead

concentrate on the continuous and dynamic negotiation of meaning in terms of history, religion, and society.

Huttayavilaiphan (2025) provides some interesting insights into the concept of digital literacy and technology-related anxiety among English teachers and university students in Thailand, thus extending the research in this area, which has been dominated by Western culture up until now. The study suggests that there is a discrepancy in perceived and real levels of digital literacy, and that increased technology usage leads to anxiety, particularly in institutions that vary in terms of technology support. When viewed in conjunction with earlier EFL research, it suggests that, while technology is used, it does not guarantee confidence in its application in the classroom. This study, therefore, supports the idea that there are many facets to digital literacy, including technical, pedagogic, and emotional factors.

The paper also contributes to our understanding of the digital competence and technology-related anxiety in Thai university English education instructors and learners. As in the previous studies by Katsarou and Bellini, there is a negative relationship between digital anxiety and competence. (Bellini et al., 2016; Katsarou, 2021). This implies that a person is less likely to experience anxiety when using digital technology if they are proficient with it. The focus on both teachers and students in this study is noteworthy because it offers a comparative approach that is uncommon in the body of literature currently in publication, which primarily concentrates on a single demographic group (Tondeur et al., 2017). This comprehensive approach allows for a better understanding of the experience of digital capabilities and anxieties, including the common problems and unique needs. Additionally, the Thai context offers a distinct and unexplored perspective, in contrast to the bulk of studies that have focused on the populations in Western and Eastern Asia.

Ihnatova et al. (2022) revealed that blended learning not only leads to the improvement of pedagogical quality but also to the digital competences acquisition of future English teachers. The research adds to the literature by providing empirical evidence of the correlation between blended learning instructional design and TPACK. The study is consistent with the literature that blended learning, it has transformed higher education institutions (Garrison & Norman D. Vaughan, 2008; Graham, 2021). The research also adds to the existing literature on blended learning that examines its transformative impact on learners' engagement, flexibility, and learner control (Rai, 2024). What distinguishes this study and the corpus of literature, however, is that this arrangement investigates only how blended learning is applied in ELTeducation. The role of blended learning models in the development of linguistic and pedagogical competencies that are essential for the training of English teachers has been the subject of numerous studies (Buluma & Walimbwa, 2021). Additionally, compared to studies like Asarta and Schmidt (2017), which place more emphasis on the results of students' performances, the present research provides a more comprehensive investigation of the effects of blended learning on teaching readiness and adaptability. It also helps readers understand the potential of blended learning in utilizing digital literacy and reflection to prepare teachers for a wide range of teaching scenarios. The contextual flexibility focus, being one of the most significant findings in this research, highlights BL's potential to cater to regional education sector requirements – a segment not often addressed in global conversations. They also acknowledge the necessity for additional investigation to support these models.

In the research by Pardo's (2024) study examined the Booktuber approach as a digital tool to assist Spanish pre-service teachers in developing their reading and literacy skills. According to the study, by socializing the reading activity, participatory video-based reading strategies increase students' motivation and engagement. According to this research and other studies on digital storytelling and social media-based learning, literacy engagement can be improved by allowing students to create content and interact with real audiences. The study's findings corroborate past research that suggests integrating digital tools into literacy training (Lankshear & Knobel, 2011; Larson, 2010), but this study advances the discussion by emphasizing the production of audiovisual content as a way to engage students on a social and cognitive level. Expanding on previous constructs that focus on the dimension of reading using e-books and blogs, the Booktuber construct focuses on the dimension of production, hence improving the oral communicative, critical, and social learning skills of learners. Thus, this study highlights the need to ensure that teachers of the future can teach the subject as well as use the technology with which the children of the future

identify. Booktube is, therefore, a bridge between pop culture and education. Thus, this study seeks to offer evidence of Booktube as an innovative literacy construct.

Nabhan (2021) focuses on the development of digital literacy practices within academic writing among pre-service EFL teachers, arguing that writing is an underexplored yet vital part of developing digital literacy within teacher education. The study illustrates that digital literacy is not just about technical skills, but also about the appraisal, organization, and meaning-making of information using digital resources. The study suggests that it is vital to include digital literacy within the curriculum of academic writing to help EFL teachers prepare for teaching with the help of digital technologies. Communication and online safety, with a focus on plagiarism and referencing, were areas of greatest self-perceived proficiency. However, these findings align with Molerov et al. (2020), who noted that students often overestimate their ability to critically examine online content and therefore experience a gap between perceived and actual digital literacy. In contrast, digital culture in creative collaboration showed the lowest competency, differing from Carretero et al. (2017), who emphasized the importance of social and cultural participation in digital environments within teacher education. It is argued that digital literacy instruction should address not only technical mastery but also cognitive and metacognitive development among EFL teachers. Overall, the study reinforces the need to equip EFL teachers to teach writing-related digital literacy, consistent with Lam and Wong (2015.) and Goodsett (2020).

Mačičková (2024) will also help close the gap related to teacher education for English as a Foreign Language by combining research about virtual exchanges with pre-service teachers to show how virtual exchanges can support the development of students' communicative competence (ICC) and professional relationships. In the studies on telecollaboration and online intercultural exchange that have been conducted so far, the results indicate that VEs that include synchronous and asynchronous interaction are the key to successful VEs. Thus, the synthesis of the research supports the use of synchronous and asynchronous interaction in EFL teacher preparation for the development of sustained interaction and professional growth. In the previous studies that examined the role and potential of VEs in the development of ICC, digital literacy, and learner autonomy, the results indicated that VEs have the potential for the development of these important aspects of language learning and teaching. However, the results also indicate that more research is needed on the use of VEs in teacher preparation (Antoniadou, 2011; O'Dowd & Lewis, 2016). This review refines its scope to pre-service teachers, offering a comprehensive framework for designing and practicing VE effectively. Though these models facilitate flexibility and reflection, the absence of synchronous interaction may impede immediate engagement and social bonding. Thus, in line with findings by Martins and Werner (2019) and Lehotska et al. (2022), the review recommends the use of synchronous video conferencing for the improvement of real-time intercultural communication.

This is because the findings of the study highlight the importance of comprehensive instructional engagement. This is similar to what O'Dowd and Waire (2009) found, as their results highlight the importance of comprehensive instructional engagement. This is similar to what Çiftçi (2016) found, as their mentor approach includes technical and pedagogical support, learner understanding, and reflection. The approach is designed for a 12-week semester and includes the various facets of instruction, learner autonomy, and reflection, as well as synchronous and asynchronous approaches.

Nguyen (2024) provides an in-depth review of prominent frameworks that can be used in assessing digital literacy among teachers. This includes DigCompEdu, DigComp, ISTE, and UNESCO's ICT-CFT. This study provides an in-depth understanding of digital competence in terms of pedagogical, professional, and technical aspects. It is beneficial in addressing the gaps in digital literacy in terms of its assessment. It has identified digital assessment as an under-explored field that is often used in an unsophisticated rather than strategic manner. It provides an in-depth review of various digital literacy assessment tools that have been developed in the last ten years. It has also identified its weaknesses, such as bias and a lack of connection with actual performance (Hatlevik, 2017). It has also examined the global usage of digital literacy frameworks such as DigCompEdu, ISTE, and UNESCO's ICT-CFT, including its usage in different contexts. It has provided recommendations on more holistic and realistic evaluations of digital literacy among teachers in today's ever-changing, technology-driven world.

Urazbayeva et al. (2024), the researchers seek to assess the impacts of the systematic use of ChatGPT on the digital literacy of English as a Foreign Language educators, with an emphasis on the significant advancements that can be achieved in the process. The study forms part of the established body of knowledge in the use of artificial intelligence in EFL scenarios. In the study, the researchers developed a mixed-methods approach to inquiry that is different from the traditional approach based on theory-driven and perception-based surveys, as presented in Gao et al. (2024) and Mohamed. (2024), In addition, it proposes the ChatGPT Integration Proficiency Assessment (CIPA) that is based on the TPACK approach to provide an objective assessment of the proficiency of teachers in the integration of the tool.

Some of the recommendations of the study include the integration of prompt engineering techniques and AI literacy among English language teachers. In addition, the study emphasizes the need for the development of appropriate mechanisms to govern the use of AI tools in the classroom, with particular attention to the issues of data privacy and the maintenance of the quality of teaching. The study provides several recommendations for the implementation of AI tools in educational spaces. The researchers also posit that language teaching professionals are change agents in AI-mediated classroom settings. The study also discusses the possibility of future versions of ChatGPT, such as GPT-4o, which can process multiple inputs. In addition, recommendations from the study are presented. Further, there is a discussion on how the ChatGPT program can be utilized (Puteri et al., 2025).

Recent research also emphasizes the importance of integrating digital literacy and technical skills, as well as pedagogical, cultural, and affective dimensions. Pre-service teachers are technically proficient in using digital tools; however, their pedagogical, subject-related, and critical digital literacy skills are still in the early stages of development, according to research. Comparative studies have examined the significance of institutional and cultural factors in the development of digital literacy skills in various contexts, including Indonesia and Thailand. The necessity for educators to familiarize themselves with the online learning environment has been brought to light by the epidemic. It has also made clear the difference between thriving and surviving. Research has shown that pre-service teachers require instruction in critical digital literacy and emotional literacy. The necessity for educators to familiarize themselves with the online learning environment has been brought to light by the epidemic. It has also made clear the difference between thriving and surviving. Pre-service teachers require instruction in critical digital literacy, emotional literacy, and AI literacy, according to the literature. AI technologies like ChatGPT, Booktube, and virtual exchanges are some of the developing technologies that have attracted attention in recent discussions.

LIMITATION

Despite the significance, there are certain limitations to this study that should be considered when interpreting the review's findings. First, only studies published in journals with a Scopus index between 2015 and 2025 were included in the review of the literature. Although Scopus is known for its high standards in journal indexing, by limiting the review to only those studies published in Scopus-indexed journals, some studies published in other prominent databases, such as Web of Science, ERIC, or Google Scholar, may have been excluded from this review. Therefore, it is possible that some of the research trends or patterns may not represent the whole gamut of studies on digital literacy or digital competence in English teacher education.

CONLUSION

This systematic review aimed to investigate studies on digital literacy and digital competence in English teacher education through a bibliometric approach and thematic analysis. The findings reveal an increase in publications over the last decade, with a lack of consistent scholarly contributions and international collaboration. The thematic analysis revealed that digital literacy and digital competence were recognized as fundamental concepts to some extent in different studies. Digital literacy has been more closely related to basic skills and communication, while digital competence has been more closely associated with pedagogical considerations. Advanced aspects, such as AI-related and transformative digital literacy/competence, are less researched.

Another significant observation in this review is the impact of contextual factors such as institutional support, cultural context, teacher cognition, emotional factors, and professional development opportunities. Although COVID-19 has increased interest in digital engagement, it has also highlighted contextual inequalities. The limitations of this systematic review are that it is a descriptive and exploratory approach. Therefore, it should be interpreted with caution as an overview of research trends. From a practical point of view, it appears that the review implies teacher education in English and professional development projects in England could be informed by approaches that extend beyond the development of technical skills in order to take account of pedagogical, reflective, and contextual aspects of digital practices. However, it should be noted that such implications should not be seen as prescriptive recommendations but as informed reflections based on research patterns. The future research in this area could be informed by more theoretically grounded studies, clear conceptual differences between digital literacy and digital competence, as well as quality appraisal and outcome-based approaches.

AUTHOR CONTRIBUTIONS

The original draft of the manuscript was prepared by SH. BYC, EE, and MH assisted in supervision, validation, provision of resources, and reviewing the manuscript. RDP, S, and MHH assisted in the management of the progression of the research and in refining the description of the manuscript to ensure consistency and currentness. All the authors have contributed to and approved the final version of the manuscript.

ACKNOWLEDGMENTS

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