Journal of Language and Literacy Learning
Vol. 1, No. 2, 46-61, 2025
ISSN(E) 3123-5093

The digital turn in L2 writing: A bibliometric study of digital literacies in language education

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Abstract

The rapid integration of digital technologies in language education has reshaped the nature of L2 writing, shifting it toward multimodal, digitally mediated, and increasingly AI-assisted practices. This study provides a comprehensive bibliometric analysis of research on digital literacy in L2 writing from 2019 to 2025. Using a dataset of 499 Scopus-indexed publications, the study maps publication trends, conceptual structures, and thematic clusters through performance analysis and co-occurrence network visualization using VOSviewer. The results show a consistent increase in scholarly output, with the lowest publication activity observed in 2019 and the highest concentration of studies occurring in 2024, alongside a marked surge in research on multimodality, digital writing tools, and AI-enhanced writing. Network and density visualizations reveal three dominant research pillars: L2 writing, multimodal composition, and digital literacy practices, alongside emerging themes related to identity, feedback, and critical digital literacy. Highly cited publications highlight the growing influence of AI in L2 writing pedagogy. The findings suggest the need for theoretical models that integrate multimodal, critical, and AI-based literacies, as well as pedagogical approaches that support learners' creative, ethical, and autonomous engagement with digital tools. This study offers the first holistic mapping of digital literacy research in L2 writing, providing a basis for future research and instructional innovation.

Keywords: digital literacy, L2 writing, multimodal composition, digital writing practices, language education.

Citation | Purnamasari I., & Alam D. (2025). The digital turn in L2 writing: A bibliometric study of digital literacies in language education. *Journal of Language and Literacy Learning*, *1*(2), 46–61.
Received: December 5, 2025 | **Revised:** December 27, 2025 | **Accepted:** December 28, 2025 | **Published**: December 30, 2025

Contribution to Literature: This study provides the first comprehensive bibliometric mapping of digital literacy research in L2 writing from 2019 to 2025. By integrating performance analysis and network visualization, it identifies key research pillars, emerging AI-related themes, and evolving scholarly trends, offering a data-driven foundation for future theoretical and pedagogical development.

1. Introduction

The rapid development of digital technologies has significantly transformed language education, redefining how learners access information, construct meaning, and communicate in multilingual settings. The rise of digital literacies, understood as the ability to locate, evaluate, create, and share multimodal content, as become central to contemporary pedagogy (Cope & Kalantzis, 2000). Within this transformative landscape, writing in a second language (L2) has undergone a profound shift, moving from traditional print-based practices toward dynamic, interactive, and multimodal forms of composition supported by digital tools and platforms (Hull & Nelson, 2005). These changes align with broader educational initiatives highlighting the need for meaningful technology integration and the cultivation of 21st-century competencies, including creativity, critical thinking, and digital communication (Fayer et al., 2017; Scott, 2015).

Digital tools now play a pivotal role in shaping L2 writing practices. Learners engage not only with alphabetic text but also with images, audio, video, and collaborative online environments that facilitate new modes of meaning-making. Approaches such as digital storytelling (DST) demonstrate how multimodal composition can enhance learners' motivation, creativity, and communicative competence (Robin, 2008; Yang & Wu, 2012). These digital practices allow students to draw upon personal experiences, cultural identities, and multilingual resources, contributing to richer writing development and heightened engagement (Cummins & Early, 2011; Anderson et al., 2018). In multicultural classrooms, where learners bring diverse linguistic backgrounds, digital and multimodal approaches further support intercultural awareness and identity exploration (Benmayor, 2008; P. M. Ribeiro, 2016; Korosidou & Griva, 2024).

Although research on digital literacies and L2 writing has grown rapidly, the field remains dispersed across applied linguistics, literacy studies, multimodality, and educational technology. Existing studies highlight the pedagogical benefits of digital composition, including improved critical thinking (Chan, 2019), creativity (Korosidou & Bratitsis, 2021), and collaboration (Korosidou et al., 2021). Yet despite this expansion, no comprehensive bibliometric analysis has mapped the global development of research at the intersection of digital literacies and L2 writing. Current literature reviews tend to be narrative and localized, lacking a systematic overview of publication trends, influential scholars, thematic clusters, and intellectual networks. This gap is significant, given the increasing importance of digital competence for effective communication in multilingual contexts (Dudeney, 2015).

A bibliometric study is therefore timely and necessary. Bibliometric methods allow researchers to analyze large bodies of scientific literature quantitatively, identifying research trajectories, collaboration networks, and thematic evolutions over time (Miles et al., 2014; Yin, 2018). In the case of digital literacies and L2 writing, such an analysis can reveal how the field has evolved alongside technological innovations, which pedagogical approaches dominate the discourse, and what emerging research areas warrant further investigation.

Accordingly, the present study aims to examine the global research landscape on digital literacies in L2 writing by applying performance analysis and science mapping techniques to Scopus-indexed publications. Specifically, the study investigates publication trends, leading authors and journals, influential countries and institutions, collaboration patterns,

and thematic clusters derived from keyword co-occurrence. By offering the first bibliometric mapping of this domain, the study contributes critical insights into the evolution, intellectual structure, and future directions of research at the intersection of digital literacies and L2 writing.

2. Literature Review

2.1. Digital Literacies in Language Education

Digital literacies have become a foundational component of contemporary language education, extending beyond technical skills to include learners' ability to construct, interpret, and communicate meaning through multimodal forms of text (Cope & Kalantzis, 2000). The growing integration of digital tools in classrooms has reshaped literacy practices, requiring educators to design pedagogical environments that support critical engagement with online resources, multimodal composition, and collaborative meaning-making (Rumenapp et al., 2018). Digital literacies enable learners to participate more fully in global communication environments and align with broader lifelong learning competencies, including digital competence and intercultural communication (European Commission, 2018; Council of Europe, 2001).

Within this context, scholars emphasize the need for meaningful technology integration that develops creativity, critical thinking, and collaboration, skills central to 21st-century education (Fayer et al., 2017; Scott, 2015). As learning environments become increasingly digital, digital literacies serve not only as instructional tools but also as frameworks guiding the design of responsive, student-centered language learning experiences.

2.2. L2 Writing in Technology-Mediated Environments

The emergence of digital and multimodal platforms has significantly influenced the nature of second language (L2) writing. Traditional print-based writing tasks are being replaced or expanded through digital storytelling, multimodal text creation, online collaboration, and interactive writing environments (Hull & Nelson, 2005; Robin, 2008). These digital contexts support richer forms of expression, enabling learners to combine images, narration, music, and written text, thereby broadening how ideas and identities are communicated (Kim & Li, 2020).

Research demonstrates that technology-enhanced writing environments can improve students' content knowledge, writing motivation, and critical thinking skills (Yang & Wu, 2012). Moreover, digital writing processes encourage learners to engage in planning, revising, and reflecting in ways that align with authentic literacy practices across academic and social contexts (Robin & McNeil, 2012).

Collaborative digital writing tools, such as storyboards, shared platforms, and interactive applications, promote peer learning and social negotiation, which are essential for developing language awareness and discourse competence (Korosidou & Bratitsis, 2021; McNeil, 2020).

2.3. The Intersection of Digital Literacies and L2 Writing

The convergence of digital literacies and L2 writing has become a dynamic and expanding field of research. Digital storytelling (DST), multimodal composition, and translanguaging strategies allow learners to draw on their linguistic repertoires, personal histories, and cultural identities to create meaningful (Cummins & Early, 2011; Anderson et al., 2018). These practices contribute not only to writing development but also to intercultural awareness and identity formation (Benmayor, 2008; P. M. Ribeiro, 2016).

Studies show that digital literacies can enhance L2 writing through Improved motivation (Korosidou & Bratitsis, 2020), Greater autonomy and creative engagement

(Spanos, 2021), Enhanced intercultural empathy (Fokides, 2016), Increased multimodal and multilingual expression (Korosidou et al., 2021).

Despite these advances, existing research remains scattered, with varying theoretical frameworks and methodological approaches. This fragmentation underscores the need for a systematic bibliometric analysis to map research trajectories and identify emerging themes in the intersection of digital literacies and L2 writing.

2.4.The Need for Bibliometric Mapping

Bibliometric analysis is a powerful tool for examining research productivity, intellectual structure, and thematic evolution within a field (Miles et al., 2014; Yin, 2018). Given the rapid expansion of digital literacy research across multiple disciplines, a bibliometric approach provides a macro-level understanding that cannot be achieved through traditional literature reviews.

Specifically, a bibliometric study will help identify core authors, institutions, and countries; influential journals and highly cited publications; keyword clusters and thematic trends; research gaps and future directions.

To date, no bibliometric study has systematically analyzed digital literacies in L2 writing, creating a significant gap that this research seeks to address.

Table 1. Research on phoneme–grapheme recognition in early EFL literacy development.

No	Title	Reference
1	Fostering Students' L2 Writing Skills and Intercultural Awareness Through Digital Storytelling in Elementary Education	Korosidou & Griva (2024)
2	Digital Storytelling for Enhancing Student Academic Achievement, Critical Thinking, and Learning Motivation	Yang & Wu (2012)
3	Developing Intercultural Awareness Using Digital Storytelling	P. M. Ribeiro, (2016)
4	The Effect of Digital Storytelling on Improving Third Graders' Writing Skills	Yamaç & Ulusoy (2016)
5	Creative and Critical Approaches to Language Learning and Digital Technology	Anderson et al. (2018)

3. Research Method

3.1.Research Design

This study employed a bibliometric research design to map scientific developments related to *digital literacies* and *L2 writing*. Bibliometric analysis is suitable for identifying publication patterns, thematic trends, and intellectual structures across large datasets (Miles et al., 2014; Yin, 2018). An initial dataset of 1,000 documents was retrieved from Scopus using combinations of keywords such as "digital literacy," "multimodal writing," and "L2 writing." After removing irrelevant, duplicate, or non-thematic publications, 984 documents were retained for analysis. The final dataset was exported in CSV and RIS formats to support both preliminary statistical processing and advanced visualization using VOSviewer.

3.2.Data Sources

Data for this study were sourced exclusively from the Scopus database, chosen for its comprehensive indexing in education, applied linguistics, and digital learning. The retrieved records were screened through titles and abstracts to ensure alignment with the study's focus on digital literacies and L2 writing. After this filtering stage, 984 publications were confirmed as relevant. The cleaned dataset was organized using Microsoft Excel for

descriptive statistics and imported into VOSviewer to generate co-authorship networks, keyword clusters, and citation mapping.

3.3.Procedure of Data Collection

Data collection followed three main steps. (1) Retrieval of documents using structured search queries combining terms related to digital literacies and L2 writing. (2) Data cleaning and organization**,** involving duplicate removal, keyword normalization, and metadata verification using Excel. (3) Computational mapping**,** where VOSviewer was used to visualize co-occurrence networks, co-authorship structures, and thematic clusters. This process enabled the identification of dominant themes, influential contributors, and emerging research directions.

3.4.Data Analysis

The analysis consisted of two complementary stages. First, descriptive statistical analysis (frequency counts, publication trends, distribution by year or journal) was conducted using Excel. Second, advanced bibliometric analysis was performed with VOSviewer to examine keyword co-occurrence patterns, citation and co-citation networks, authorship and institutional collaboration, and thematic clustering based on total link strength.

These combined procedures produced a comprehensive overview of the intellectual landscape of digital literacies in L2 writing (Howitt & Cramer, 2011; Yang & Wu, 2012).

4. Results and Discussion

4.1.The Digital Literacy in L2 Writing 2019- 2025

The bibliometric analysis covering 2019–2025 reveals a clear and accelerating growth in research on digital literacy within L2 writing contexts. From the initial dataset of 500 retrieved publications, 499 documents met all inclusion criteria, while one was excluded due to incomplete metadata. This ensured that the final dataset remained clean and fully analyzable for bibliometric mapping.

As shown in Table 2, publication output demonstrates a steady upward trajectory beginning in 2019, with research momentum increasing significantly after 2021. The highest volume of publications occurred in 2024, with 104 documents, representing 20.84% of all output, followed by 2025 with 82 publications (16.43%). This trend aligns with the rising emphasis on digital tools, multimodal composition, and technology-enhanced writing processes in language education. The visual pattern presented in Figure 1 further highlights this progression, illustrating how scholarly attention toward digital literacy in L2 writing intensified during the period of global digital transformation and post-pandemic shifts toward online learning.

The growth between 2022 and 2024 reflects expanded adoption of digital platforms for writing instruction, increased research interest in digital storytelling, and stronger recognition of digital literacy as a core component of L2 writing pedagogy. Although 2025 shows a slight decline from the 2024 peak, the number of publications remains substantially higher than in earlier years, indicating the field's continued maturity and sustained relevance. This consistent upward trend reinforces findings from prior research that position digital literacies as essential for supporting creativity, multimodality, and meaningful engagement in L2 writing environments.

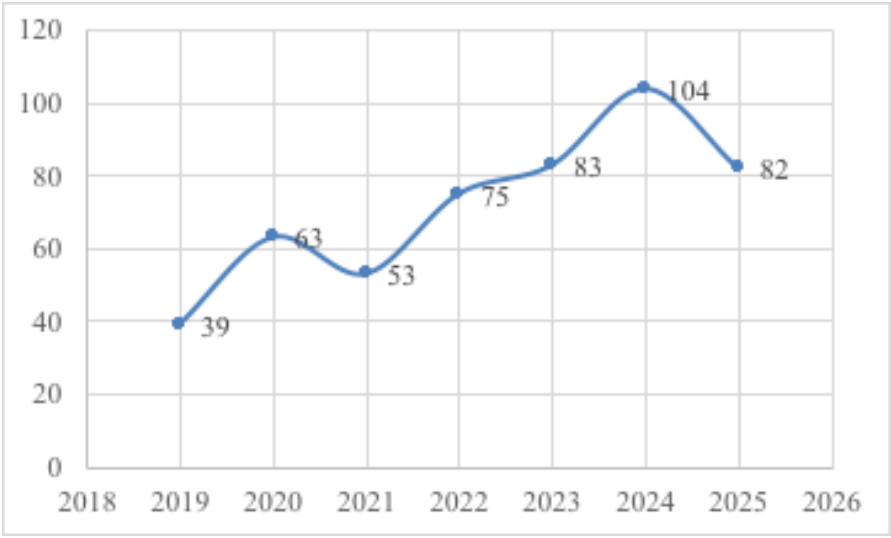

Figure 1. Annual report of publications in digital literacies research (2019–2025).

Table 2. Annual report research on "phoneme–grapheme recognition in early EFL literacy development".

Year	Documents	Percentages (%)
2019	39	7.82%
2020	63	12.63%
2021	53	10.62%
2022	75	15.03%
2023	83	16.63%
2024	104	20.84%
2025	82	16.43%
Total	**499**	**100%**

4.2.Most Influential and Highly Cited Publications

The analysis of citation performance reveals a set of highly influential publications that have shaped the research landscape on digital literacy in L2 writing. As shown in Table 3, the most cited works span diverse thematic areas including online learning, AI-assisted writing, digital multimodal composing, digital storytelling, and teacher digital literacy. The presence of publications with extremely high yearly citation averages, particularly those published in 2023–2024, indicates a rapid acceleration of scholarly interest in AI technologies, multimodal composition, and digitally mediated writing practices in L2 contexts.

The most cited article, *"Learning from experience in the midst of COVID-19"* (Bailey & Lee, 2020), has accumulated 372 citations, reflecting the global impact of the pandemic on digital learning and its subsequent influence on literacy practices. Similarly, research addressing the role of AI-generated text in L2 writing (Warschauer et al., 2023) and AI-based writing assistants (Zhao, 2023) demonstrates exceptionally high citation-per-year rates, underscoring how artificial intelligence has become central to discussions of digital literacy and writing development.

Foundational studies on digital multimodal composing (Hafner & Ho, 2020; Lim & Polio, 2020; Shin et al., 2020) also appear prominently, confirming that multimodality remains a core dimension of digital literacy in L2 writing pedagogy. Additionally, scholarship on digital storytelling (Kim & Li, 2020) and digital literacy practices of pre-

service teachers (Akayoglu et al., 2020) highlights the continued relevance of narrative-based learning and teacher preparedness in digital literacy frameworks.

Notably, the emergence of ChatGPT and generative AI has produced immediate scholarly impact, as seen in Teng (2024) systematic review with 113 citations within a single year, indicating a dramatic shift toward AI-enhanced writing processes and digital literacy competencies. Overall, these influential works not only anchor the intellectual structure of the field but also reveal how digital literacy in L2 writing has evolved, from early multimodal and blended learning studies toward more recent AI-driven and technology-saturated learning environments.

Table 3. Most cited articles on the digital literacy in L2 writing.

No	Cites	Title	Year	Cites Per Year	Author(s)
1	372	Learning from experience in the midst of COVID-19: Benefits, challenges, and strategies in online teaching	2020	74.40.00	Bailey & Lee
2	346	The affordances and contradictions of AI-generated text for writers of English as a second or foreign language	2023	173.00.00	Warschauer et al.
3	290	Digital literacy in higher education: A case study of student engagement with e-tutorials using blended learning	2019	48.33.00	McGuinness & Fulton
4	278	Leveraging artificial intelligence (AI) technology for English writing: Introducing wordtune as a digital writing assistant for EFL writers	2023	139.00.00	Zhao
5	269	Assessing digital multimodal composing in second language writing: Towards a process-based model	2020	53.80	Hafner & Ho
6	224	Integrating the 4Cs into EFL integrated skills learning.	2020	44.80	Pardede
7	198	Digital storytelling: Facilitating learning and identity development	2021	49.50.00	Kim & Li
8	194	Digital literacy practices of Turkish pre-service EFL teachers	2020	38.80	Akayoglu et al.
9	172	A study on the utilization of OpenAI ChatGPT as a second language learning tool	2023	86.00.00	Kim et al.
10	154	Print vs Digital Reading Comprehension in EFL.	2019	25.67	Pardede
11	152	In the shadow of Coronavirus: Distance education and digital literacy skills in Greece	2020	30.40.00	Tzifopoulos
12	143	Investigating teachers' attitude toward digital literacy in EFL classroom	2021	35.75	Pratolo & Solikhati
13	139	Development of metalanguage for multimodal composing: A case study of an L2 writer's design of multimedia texts	2020	27.80	Shin et al.
14	139	Multimodal assignments in higher education: Implications for multimodal writing tasks for L2 writers	2020	27.80	Lim & Polio
15	139	English language teaching of attitude and emotion in digital multimodal composition	2020	27.80	Unsworth & Mills
16	128	Multimodal composing and traditional essays: Linguistic performance and learner perceptions	2020	25.60	Kim & Belcher

No	Cites	Title	Year	Cites Per Year	Author(s)
17	124	Gamers, surfers, social media users: Unpacking the role of interest in English	2019	0,87986111	Brevik
18	113	A Systematic Review of ChatGPT for English as a Foreign Language Writing: Opportunities, Challenges, and Recommendations.	2024	113.00.00	Teng
19	109	Virtual exchange for (critical) digital literacy skills development	2019	18.17	Hauck
20	101	English as a foreign language writers' metacognitive strategy knowledge of writing and their writing performance in multimedia environments	2019	0,72430556	Qin & Zhang

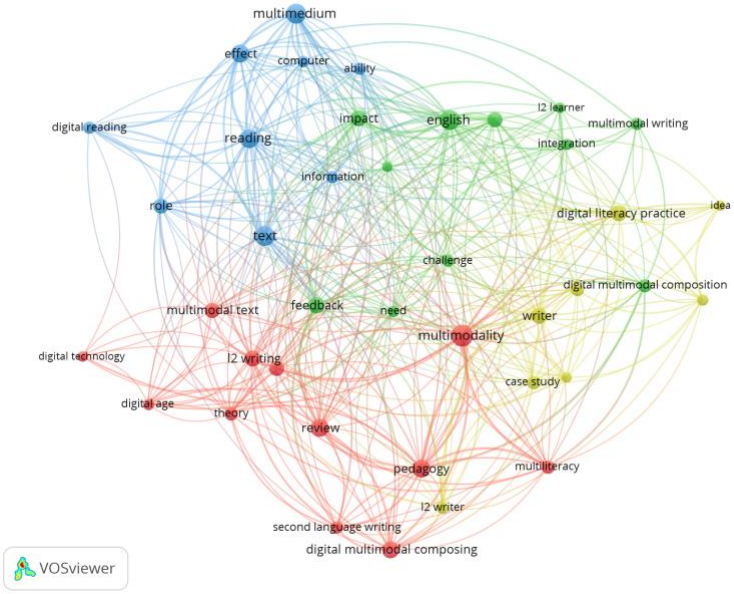

Figure 2. Network visualization based on co-occurrence of terms.

4.3. Visualization of Research Data Mapping of Phoneme–Grapheme Recognition In Early EFL Literacy Development

A bibliometric network visualization was produced using VOSviewer to map the conceptual structure of research on digital literacy in L2 writing. As part of the term co-occurrence analysis, a total of 2,748 terms were automatically extracted from titles, abstracts, and author keywords within the dataset. To ensure analytical precision, a minimum threshold of 10 co-occurrences was applied, narrowing the pool to 66 terms. These were further refined by selecting only the top 60% of most meaningful and contextually relevant terms, resulting in a final set of 40 core terms. These 40 terms form the conceptual backbone of the co-occurrence network presented in Figure 2.

The network visualization in **Figure 2** reveals four distinct thematic clusters, each representing dominant research directions within digital literacy and L2 writing scholarship. **Cluster 1 (Red)** consists of 12 items and centers on foundational concepts such as *digital age, multimodal literacy, multiliteracies, pedagogy,* and *second language writing*. This cluster reflects the strong theoretical grounding of the field, emphasizing how multimodality and digital innovation have redefined L2 writing practices at both conceptual and pedagogical levels.

Cluster 2 (Green) contains 11 items and reflects the practical and pedagogical challenges of integrating digital tools into L2 writing contexts. Terms such as *digital tool,*

feedback, impact, integration, and *systematic review* highlight recurring themes in studies exploring how technology supports or complicates writing instruction for L2 learners. This cluster underscores ongoing discussions regarding teacher readiness, learner needs, and the effectiveness of digital interventions.

Cluster 3 (Blue) comprises 9 items and focuses on digital reading, comprehension, and information processing. Items such as *digital reading, effect, information,* and *text* illustrate the interplay between reading and writing literacies in digital spaces. This cluster demonstrates that L2 writing research increasingly considers reading–writing connections in multimodal and digital environments.

Cluster 4 (Yellow) includes 8 items and represents identity-oriented and practice-based dimensions of digital literacy. Key terms such as *critical digital literacy, identity, L2 writer,* and *digital literacy practice* indicate an emerging interest in how learners construct identities, negotiate agency, and engage in digital writing practices across social and educational contexts. This cluster is particularly aligned with contemporary perspectives on learner voice, empowerment, and identity expression in multimodal L2 writing.

The overlay visualization in **Figure 3** further reveals the temporal evolution of these themes. Earlier research tended to focus on conceptual and theoretical constructs such as *multiliteracies* and *multimodal text*, while more recent studies have shifted toward *digital tools, AI-supported feedback, identity construction,* and *critical digital literacy*. This pattern suggests a growing emphasis on learner-centered, technology-mediated writing practices, reflecting broader shifts toward personalization, autonomy, and critical engagement in L2 digital writing environments.

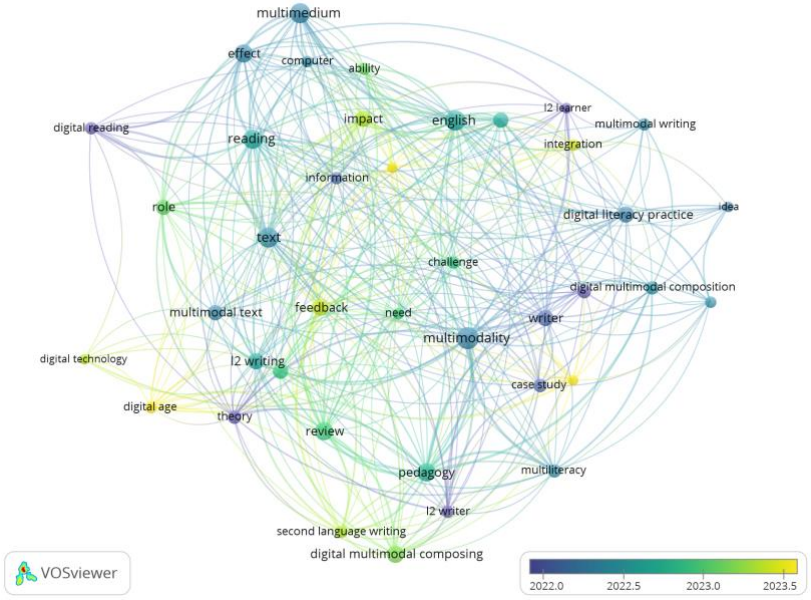

Figure 3. Overlay visualization based on co-occurrence of terms.

The density visualization in Figure 4 provides further insight into the prominence and intensity of conceptual terms in the dataset. Areas with brighter coloration indicate terms with higher co-occurrence frequencies, reflecting their central role in shaping the intellectual structure of the field. As shown in Figure 4, terms such as *"L2 writing," "multimodality," "text," "reading," "English,"* and *"digital literacy practice"* appear in the brightest regions, suggesting their strong interconnectedness and dominance across publications. This distribution corroborates earlier findings (Figure 2 and Figure 3) and highlights the cross-cutting relationships linking digital literacy, reading–writing processes, and multimodal composition in L2 contexts.

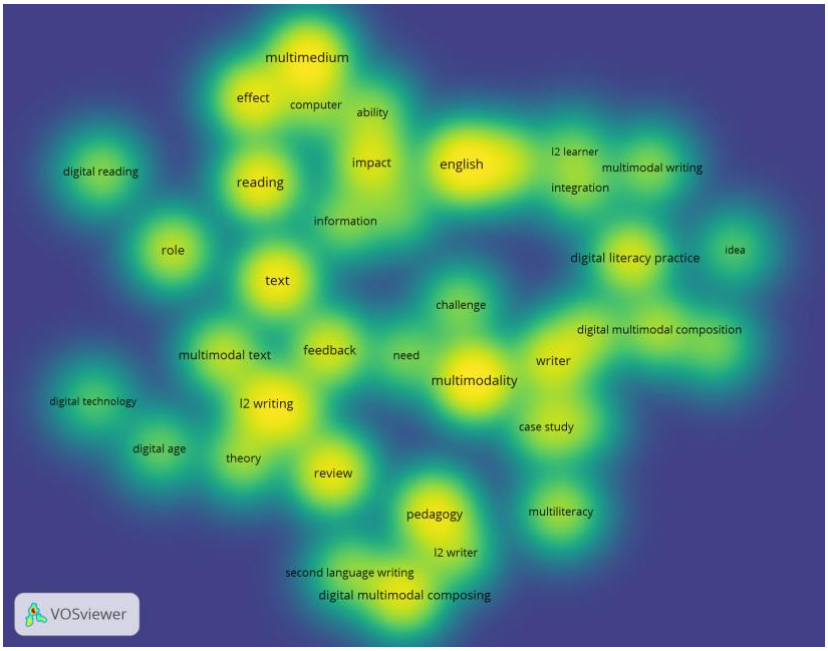

Figure 4. Density visualization based on the co-occurrence of terms.

The network visualization in Figure 5 isolates the thematic cluster surrounding L2 writing, revealing how this construct functions as a hub linking theoretical elements, writing processes, and pedagogical frameworks. Terms closely associated with L2 writing, such as *"review," "theory," "second language writing,"* and *"multimodal text"*, illustrate that research in this cluster is grounded in both theoretical perspectives and empirical analyses of writing development. The connections extending toward *"digital age," "digital technology,"* and *"pedagogy"* reflect how digitalization has become integral to contemporary L2 writing instruction.

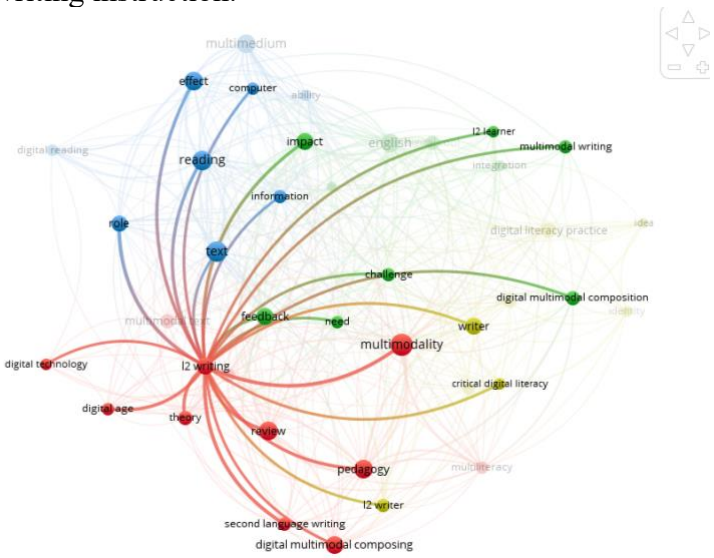

Figure 5. Network visualization of L2 writing.

Meanwhile, Figure 6 focuses on the network surrounding multimodal writing, capturing its position as a major conceptual driver of digital literacy research. Key terms, such as *"multimodality," "integration," "feedback,"* and *"digital multimodal composition"*, highlight how multimodal text production is analyzed not only as a writing skill, but also as a complex literacy practice requiring technological, semiotic, and communicative

competence. This structure aligns with global trends where multimodal composition forms a central aspect of digital literacy and 21st-century communicative proficiency.

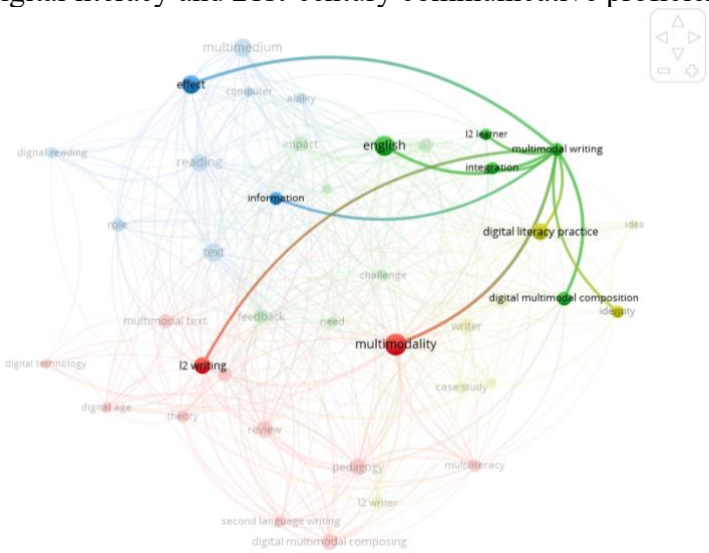

Figure 6. Network visualization of multimodal writing.

Finally, Figure 7 illustrates the network for digital literacy practice, showing its thematic ties to *"identity," "critical digital literacy," "writer,"* and *"idea."* This indicates a research shift toward learner-centered perspectives, where digital literacy is examined as an identity-mediated and socially situated practice. The strong link to *"L2 learner"* and *"multimodal writing"* suggests that digital literacy practices are increasingly understood as spaces for expression, negotiation of meaning, and construction of authorial identity, consistent with contemporary sociocultural approaches to digital literacies.

Taken together, the four visualizations (Figures 4 -7) collectively demonstrate how the field of digital literacy in L2 writing is organized around three major conceptual pillars:

1. L2 writing processes and theory,
2. multimodal composition and design, and
3. digital literacy practices linked to identity and critical engagement.

These themes reinforce the evolution of L2 writing toward a digitally mediated, multimodal, and socially meaningful practice supported by diverse technological tools.

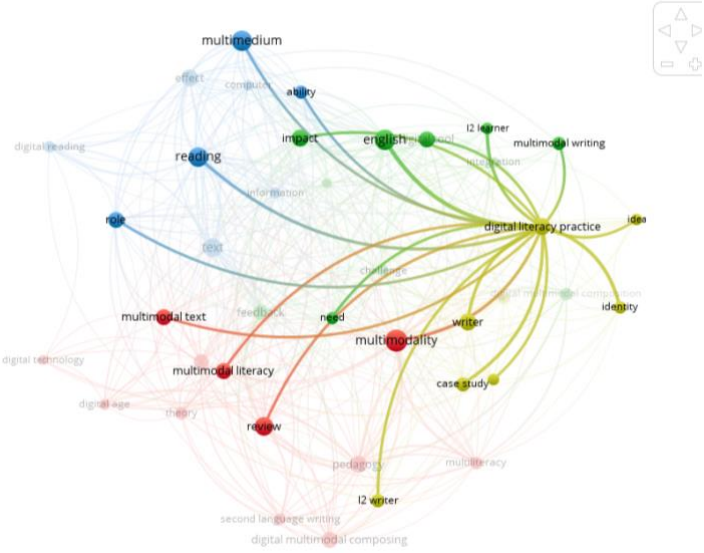

Figure 7. Network visualization of digital literacy practice.

4.4.Synthesis and Implications

The findings of this bibliometric review demonstrate that research on digital literacy in L2 writing has expanded rapidly from 2019 to 2025, supported by rising publication output and increasingly interconnected thematic clusters. The prominence of terms such as *L2 writing, multimodality, multimodal writing,* and *digital literacy practice* confirms that digital writing is now understood through multimodal and multiliteracies perspectives (Cope & Kalantzis, 2000; Hull & Nelson, 2005). This aligns with earlier studies emphasizing the centrality of multimodal composition in digital-age writing instruction (Hafner & Ho, 2020; Lim & Polio, 2020).

A key insight from our mapping is the growing influence of AI-supported writing tools, reflected in highly cited works on ChatGPT and digital writing assistants (Warschauer et al., 2023; Zhao, 2023; Teng, 2024). This marks a shift from earlier emphases on multimodal storytelling (Anderson et al., 2018;Kim & Li, 2020) toward more technologically mediated forms of writing, suggesting that digital literacy now involves navigating AI-generated text, automated feedback, and ethical concerns around authorship.

Another notable finding is the increased attention to identity and critical digital literacy. Cluster patterns highlight concepts such as *identity, critical digital literacy,* and *writer*, indicating a move toward learner-centered frameworks where digital writing is viewed as a space for self-expression and cultural negotiation (Cummins & Early, 2011; P. M. Ribeiro, 2016). This complements recent research showing that digital environments can empower L2 learners to construct and share multimodal identity texts.

The novelty of this study lies in offering the first holistic bibliometric synthesis of digital literacy in L2 writing, integrating publication trends, thematic structures, and conceptual networks. While prior research examined multimodal writing or digital storytelling in isolation, our results unite these strands and reveal how they evolve alongside emerging AI and digital-practice orientations.

Based on these insights, future research should:

(1) examine the long-term effects of AI tools on L2 writing development;

(2) explore digital literacy practices through identity, agency, and sociocultural perspectives; and

(3) investigate pedagogical models that integrate multimodal, critical, and AI-based literacies.

Overall, the findings affirm that digital literacy in L2 writing is transitioning toward a more complex ecosystem that merges multimodal design, technological mediation, and critical engagement, offering new opportunities and challenges for learners and educators alike.

5. Conclusion

This study aimed to map the development of research on digital literacy in L2 writing from 2019 to 2025. The bibliometric analysis of 499 publications shows a consistent rise in scholarly interest, driven by the expansion of digital tools, multimodal composition, and AI-supported writing. The network visualizations identified three dominant research pillars: L2 writing, multimodality, and digital literacy practices, confirming that contemporary L2 writing is increasingly shaped by technological innovation and multimodal communication.

A notable trend is the growing influence of AI technologies such as ChatGPT and digital writing assistants, signaling a shift toward more automated and technology-mediated writing environments. The emergence of identity- and practice-oriented terms

also highlights the importance of learner voice, agency, and critical digital literacy in digital writing contexts.

The findings suggest several future directions. Theoretically, researchers should investigate integrated models that link multimodal, critical, and AI-based literacies. Practically, educators need to design writing instruction that prepares learners to engage creatively and responsibly with digital and AI tools. Further empirical work is needed to understand how digital literacy develops over time and how it impacts L2 writing performance.

In sum, this study offers the first comprehensive bibliometric overview of digital literacy in L2 writing, providing a foundation for future inquiry and pedagogical innovation in a rapidly evolving digital landscape

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding Acknowledgment

This research received no external funding from any party.

Author Contributions

Purnamasari: Conceptualization, initial draft writing, methodology, data collection; Alam: Editing, and revision.

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