

The Practical Use of Digital Literacies: Theory, Tools, and Praxis Concerning the EFL Reading Skill

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ABSTRACT

There has been a paradigm shift in reading due to the digital shift in education, particularly in relation to English Foreign Language (EFL) classrooms where reading is done using digital platforms. Reading in modern EFL classrooms is no longer a matter of decoding paper texts but involves critically navigating digital spaces. This systematic review critically evaluates current literature on digital literacy and reading skills in EFL classrooms from theoretical perspectives, digital support tools, and classroom implementations. Using PRISMA-compliant searches, a total of thirty-seven peer-reviewed articles from Scopus, Web of Science, ERIC, and Google Scholar published between 2010 and 2024 were selected based on inclusion criteria and analyzed using theme

coding. This systematic review reveals that teaching digital literacy skills positively impacts EFL learners' reading comprehension, motivation, and critical reading when underpinned by sound theoretical foundations of multiliteracies and metaliteracy approaches. Nevertheless, existing issues in teaching digital literacy skills in classroom settings lie in teachers' digital pedagogy skills, particularly students' ability to critically assess digital texts, as well as inequitable access to technology. Informed prospective analysis of social annotation tools such as Hypothesis provides an indication of digital tool efficacy in promoting collaborative reading.

Keywords: digital literacy, reading comprehension, EFL, multiliteracies, digital pedagogy, systematic review, social annotation

1. INTRODUCTION

Reading was, and still is, an essential component of language learning, particularly for grammar study, vocabulary building, and making sense of what is read. In conventional EFL settings, reading referred to printed texts, where students learned how to decode, word identify, and comprehend what was read. However, due to the increase in digital technology, reading has changed. The new reading environment is digitally enhanced and is characterized as "multimodal, interactive, and networked" (Leu et al., 2013). In effect, today's EFL students are exposed to English texts found in online websites, online magazines, online social networking sites, online textbooks, and online learning management systems. This new form of reading implies that the reader must navigate hyperlinks, evaluate source information, understand visuals, comprehend audio-visuals, and assemble information from multiple digital sources. In effect, new literacies for new times call for new digital literacies, "a mix of technical skills, mental strategies, and critical insight" (Ng, 2012).

Digital literacy has become a central concern in educational policy and research, particularly within language education. Scholars argue that reading in digital contexts cannot be adequately addressed through traditional literacy frameworks alone, as digital texts demand new forms of meaning-making and critical engagement (Lankshear & Knobel, 2015; Kern, 2014). For EFL learners, the challenge is compounded by linguistic constraints, making digital literacy instruction an essential component of effective reading pedagogy. Despite growing interest in digital literacy in ELT, existing research remains fragmented across theoretical discussions, empirical investigations of digital tools, and classroom-based studies of pedagogical practices. Moreover, few studies provide a comprehensive synthesis focused specifically on digital literacy in EFL reading skill development; this shift necessitates a reconceptualization of literacy itself, moving from a focus on discrete skills to understanding literacy as a socially mediated practice (Warschauer, 2011). To address this gap, the present study conducts a systematic review of empirical and theoretical research published over the past 15 years.

The review is guided by the following research questions:

1. What theoretical frameworks underpin research on digital literacy in EFL reading?
2. What digital tools and technologies are employed to support reading comprehension in EFL contexts?
3. How is digital literacy operationalized in EFL classroom praxis?
4. What challenges and limitations are reported in the implementation of digital literacy-oriented reading instruction?

2. METHODOLOGY

This chapter describes the methodological design of the current systematic review. To make such a synthesis valid, reliable and bias-free (Cortes 2004: 365), the protocol must be systematic and transparent in methodology, which also contributes to credibility of this review's findings and interpretation of digital literacy in EFL reading. The research design, search strategy, and methods used to survey and synthesize the literature are described in the following sections.

2.1 Research Design

As a means of constructing a strong base for inquiry, we employ this research design by using systematic literature review methodology. This method was chosen as a means of systematically identifying, evaluating and synthesizing all the available evidence on a clearly defined question. The discipline of a protocol limits the reviewer bias, ensuring review more reliable and replicable Nature reviews The Cochrane Handbook provides guidance for conducting a systematic review (Petticrew & Roberts, 2006) and such guidance is absent in a narrative review. PRISMA 2020 guidelines (Page et al., 2021) were used as a guiding framework for review implementation and directly influenced the rigour of methodology, clarity, and comprehensiveness in reporting.

2.2 Sources of data and search strategy

An extensive and recursive search strategy was applied to cover the spectrum of academic literature on digital literacy in EFL reading. The primary search was performed in four broad-spectrum and specialized databases: Scopus, Web of Science, Educational Resources Information Center (ERIC), and Google Scholar. Searches were conducted up to December, 2025. To reconcile both sensitivity and specificity, a combination of keyword strings was constructed based on key terms: "digital literacy," "EFL reading," "digital reading," "multiliteracies," "technology-mediated reading. Boolean advance searching (AND, OR) and phrase searches in quotation marks were used to narrow the results. For example, the

search term ("digital literacy" OR "multiliteracies") AND ("EFL" OR "English as a foreign language") AND ("reading comprehension" OR "reading skill*") was used to retrieve records related to the intersection of these areas. Search was restricted to peer-review articles published from 2010 till 2024 with the purpose of concentration on current advances and a manageable area.

2.3 Inclusion and Exclusion Criteria

Use of explicit inclusion and exclusion criteria is an important process to maintain relevance and quality when identifying studies for synthesis. These filters serve as guiding principle that narrows down the search results to the corpus of literature being analyzed in the review, by leading from the initial pool of search results to a final corpus that answers directly on the review question. The relevant criteria were as follows:

Inclusion criteria:

Manuscripts covering 2010–2024 in peer-reviewed journals.

Research on digital literacy and reading skills in EFL or ESL.

Quantitative/qualitative/mixed-methods empiric studies and systematic reviews.

Articles written in English.

Exclusion criteria:

Studies that specifically targeted skills other than reading (e.g., writing, speaking).

Non peer-reviewed publications (e.g., conference proceedings, reports, theses, book chapters without peer review).

Research not explicitly mentioning digital literacy, digital reading, and technology mediated reading pedagogy.

2.4 Selection of Studies and Data Analysis

The first handsearch identified 218 records. After duplicates were excluded, 187 unique records remained for screening. Two-stage screening was conducted. The titles and abstracts were evaluated based on inclusion criteria to identify a total of 61 articles as potentially relevant. Second, the 61 papers were screened for full text articles ($n = 24$), which were either not relevant in terms of all criteria (e.g., no empirical focus on reading) or not located within an EFL context. A total of 37 studies, therefore, were included for final in-depth analysis. Information on the included studies was extracted according to a standard coding sheet created for this review. The scheme included publication year, research context (i.e., country, education level), theoretical framework, methodological design, the digital tools the studies focused on and major findings relevant to reading outcomes. An inductive thematic analysis (Braun & Clarke, 2006) was subsequently performed on each set of data to discover, analyze and report recurring patterns (themes) across the dataset that were informed by answering the research questions. Thirty-Seven studies were included in this review for final thematic analysis. To help summarize the critical empirical results, a sample subset of each are presented in Table 3.1

3. Results

The systematic search and the screening resulted in a final selection of 37 studies. The synthesized results of these review studies are here described, structured following the research questions of this review. The lecture goes from the theoretical basis that supports research to the methodology and empirical findings in literature.

3.1 Theories Guiding the Study on Digital Literacy and Reading

The studies investigated adopted various linked theoretical bases in conceptualizing digital literacy for EFL reading, showing the transition from skills-based theories to critical and socio-

cultural approaches. Among these are information, media and digital communication competences (Dudeney et al., 2013).

3.1.1 Multiliteracies Theory

The most commonly used model was multiliteracies (New London Group, 1996). This perspective proposes that communication and meaning production in the digital era are necessarily multimodal including such modes as language, image, sound, space, gesture which frequently intersect. In the field of EFL reading, multiliteracies theory has justified incorporating multimodal digital texts such as infographics, interactive websites and videos into the classroom and supports pedagogy that trains learners on how to read (consume) and write (design) these types of texts (Cope & Kalantzis, 2015; Dudeney et al., 2013).

3.1.2 Metaliteracy

Mackey and Jacobson's (2014) concept of metaliteracy is a particularly important way to look at digital reading. It both extends and transcends conventional information literacy, foregrounding metacognitive, critical, and participatory facets of consuming digital information ecologies. Research based on this model is described, which has concentrated on teaching EFL students to access/evaluate internet information using online sources, ethical use of digital sources information and how to re-assemble knowledge across the web.

3.1.3 New Literacies Theory

New literacies theory (Leu et al., 2013) informs work that understands digital reading as a constellation of ever-changing, socially situated practices. This concept draws the attention away from stable skills towards adaptive strategies demanded by online research and comprehension, as for instance searching information effectively, evaluating search results critically, and

overcoming difficulties that occur when reading digitally. This shift in definition can be seen as a conceptual extension from one anchored on waves of literacy for print to include other areas such as media and information literacy (Koltay, 2011).

3.1.4 Socio-Cognitive and Sociocultural Perspectives

A large body of research has taken a socio-cognitive or sociocultural perspective (Kern, 2014; Warschauer, 2011) where digital tools are seen as mediating social interaction and cognitive development. From this angle, reading is considered to be enriched through technology-mediated collaborative activities in which tools such as forums or annotated goods provide a dialogic meaning-making and peer scaffolding, placing reading process as distributed and communal rather than individualism.

3.2 Digital Resources and EFL Reading Devices for Learners

The use of digital applications in reading instruction is a central theme within the reviewed literature. This section lists and reviews the different technological applications used in EFL settings, considering their purposes as pedagogic tools and effects on reading. The tools span from those with the basic functions to access and understand, to technologies that promote complex collaborative engagements as well as critical reflections on texts.

3.2.1 Hypertext and Multimedia Reading Environment

These tools offer texts with hyperlinks, in line glossaries and multimedia annotations (images, audiopronunciations, short videos). Studies show that they can greatly contribute to vocabulary learning and literal comprehension among lower-program students by offering instantaneous context-sensitive information (Jeong, 2012). Yet studies also warn of the risk of cognitive overload if multimedia elements are not well integrated and meaningful.

3.2.2 Digital Tools Supporting Social Annotation Facilitated by technolog

Digital social annotation is a process where individuals read or share annotations based on their written work (de Liddo and Buckingham Shum 2013).

Platforms such as Hypothesis and Perusall enable users to select text from a specific page, highlight it and provide marginal comments that others can view with proper identification. This technology provides a direct instantiation of socio-cognitive theories by rendering the reading process visible and social. Collaborative annotation is found to promote Active Reading, a deepening of Textual Analysis, improving Comprehension and building Communities of Inquiry (COI) in which learners co-construct knowledge (e.g., Zhu et al., 2020; Huang, 2023).

3.2.3 MALL applications

There are graded readers and news aggregators – as well as apps for full eBooks, which sometimes come with dictionaries and reading comprehension quizzes. Studies have found that MALL for reading is consistently associated with higher learner autonomy, engagement, and reading fluency as it encourages extensive outside-of-classroom reading habits (Chen & Hsu, 2020; Lan, 2020).

3.2.4 Emerging and AI-Powered Platforms

Anticipated areas of growth in research will concern more specialized platforms, for instance adaptive learning systems that individualize text difficulty and reading paths (e.g., StufeVoc), AI-based tools generating interactive questions/synopses Early research on automated grading systems in writing suggest a potential such form of adaptive feedback also for reading (Yang, 2018). Promising as they are for differentiated instruction, these tools raise new questions about learner data privacy, the role of teacher oversight, and the necessity of AI literacy to accompany digital literacy (Godwin-Jones, 2022).

3.3 Evidence of Impact and Implementation

Through a review of empirical studies, this paper finds that there appear to be several touchstones of applying digital literacy in EFL reading.

3.3.1 Effects on Comprehension, Motivation and Autonomy

Studies with quantitative and mixed-methods design mostly presented positive results. Correlation studies (for example, Sari et al., 2024) show that there is a significantly positive link between the level of digital literacy of the learner and reading comprehension scores. Experimental or quasi-experimental research demonstrates that students learn more from using annotation tools or multimodal platforms compared to traditional instruction in reception and critical comprehension (Huang, 2023). Thematically, a strong theme is the improvement of intrinsic motivation and learner autonomy because digital tools often offer more choice, interactivity, and agency (Lee & Park, 2023).

3.3.2 Fostering of critical digital literacy skills

Higher-order effects Research emphasizing outcomes at the higher end of the hierarchy suggests that thoughtful digital literacy instruction can move beyond mere comprehension. Project-based digital tasks (e.g., creating a collaborative video) have been found to promote deeper disciplinary literacy and critical engagement (Hafner & Miller, 2019). Source Evaluation: In order to succeed on the assessments, a learner must be able to source information themselves from online sources and to evaluate that information in terms of credibility and bias by synthesizing perspectives across multiple digital texts (core components of metaliteracy) (Mackey & Jacobson, 2014).

3.3.3 The Key Role of Pedagogical and Teacher Design Mediation

One common and important observation is that the tool itself isn't contributing to the change. Effectiveness is largely a factor of pedagogical design and teacher mediation. Effective implementations include clear learning goals, explicit strategy lessons (e.g., "how do I evaluate a website," "how do I write a constructive annotation"), and a teacher who actively facilitates to focus and extend conversation. Pradita and Ningsih (2024) argue that in the absence of this skilled intermediary, there is a danger that all of this could be wasted as technology use is only surface deep.

Table 3.1: Synthesis of Representative Empirical Studies on Digital Literacy and EFL Reading (2010–2024)

Author(s)	Context (Country/Region & Level)	Methodology	Digital Focus	Key Findings
Ng (2012)	Australia; University EFL	Mixed-Methods	Digital Literacy Framework	Digital literacy training improved comprehension and fostered greater learner autonomy.

Jeong (2012)	South Korea; University EFL	Experimental	Hypertext with Multimedia Glosses	Multimedia annotations significantly aided reading comprehension over text-only glosses.
Leu et al. (2013)	USA; Secondary L2	Theoretical/Review	New Literacies	Defined digital reading as a problem-solving process requiring new, online research skills.
Cope & Kalantzis (2015)	Multinational; Theoretical	Theoretical	Multiliteracies Pedagogy	Argued for teaching design elements of multimodal texts to empower learners as meaning-makers.

Huang (2023)	China; University EFL	Quasi-Experimental	Social Annotation Tool	The experimental group using collaborative annotation showed superior critical analysis in post-tests.
Lan (2020)	Taiwan; Secondary EFL	Case Study	Gamified Mobile Reading App	Increased voluntary reading time and peer interaction, boosting motivation and fluency.
Sari et al. (2024)	Indonesia; University EFL	Correlational	Digital Literacy Level & Reading	Found a statistically significant positive correlation between students' digital literacy and reading comprehension.

				nsion scores.
Pradita & Ningsih (2025)	Indonesia; Secondary EFL	Qualitative (Interviews)	Teacher Mediation Strategies	Identified teacher's role in modeling and scaffolding as the critical factor for successful digital reading tasks.
Zhu et al. (2020)	USA; University L2	Meta-Analysis	Digital Annotation Tools	Found a moderate overall positive effect on comprehension and engagement outcomes across studies.
Lee & Park (2023)	South Korea; University EFL	Structural Equation Modeling	Self-regulation & Motivation	Digital literacy indirectly enhanced reading comprehension by positively

				affecting self-regulation and motivation .
Chen & Hsu (2020)	Taiwan; University EFL	Experimental	Mobile-Assisted Learning System	The personalized mobile learning system led to significant improvements in reading achievement and motivation .
Hafner & Miller (2019)	Hong Kong; University ESP	Qualitative Case Study	Digital Video Project	Collaborative digital projects enhanced disciplinary literacy, learner autonomy, and multimodal communication skills.

Note: The table includes samples of studies from the total corpus (N=37) under study. The inclusion of studies was determined by the methodological quality, direct applicability to general thematic findings and variation in research settings

4. Discussion

Based on the findings presented above, this section exposes a critical discussion and integration of what was found. It analyses the overlaps and discrepancies in the literature, discusses implications for theory and practice, and situates the challenges it outlines. The conversation seeks to achieve more than descriptive summary by providing analytical depth that links the empirical data to wider digital language learning debates.

4.1 Tools and Theory Reconciliation: Pedagogy Imperative

One of the key tensions highlighted by the review is that between the pace at which digital tools are advancing and how slowly pedagogical integration has followed along. The data shows that tools work, not due to their technological features per se, but when they are subservient to good pedagogy who have their underpinnings in theories like multiliteracies or metaliteracy. Using an annotation tool isn't by itself a literacy practice it's a technical one but using it to teach sourcing or collaborative meaning-making is. This highlights the need for teacher education to commit to TPACK instruction in effective technology enabling them for both technical and pedagogical reasoning, not just one.

4.2 Beyond the access: second level digital divide and affective barriers

Despite pervasive concerns about digital technology access, this article focuses attention on a more insidious second-order divide, one of less equal production of complex or critical literacies. Furthermore, affective barriers are significant. Learners may as a consequence feel anxious when trying to follow authentic, complex English-language digital spaces, or refuse to public annotate in a second language due to the fear of mistakes. It follows that

effective digital literacy instruction should make use of safe, scaffolded environments for both cognitive and affective aspects of learning.

4.3 The Assessment Lag

Traditional assessment paradigms are lagging when it comes to innovative digital reading practices. There are few investigations of how best to validly measure the collaborative, nonlinear and critical thinking involved in digital literacy (e.g., the extent to which a learner has contributed to a collaborative annotation thread, or synthesised information from hyperlinked text). The creation of new, authentic assessment rubrics related to these practices is a pressing requirement for curriculum alignment and diffusion. This is consistent with the idea of 'mobile literacies' which encapsulates situated, context-bound learning (Pegrum, 2019)

4.4 Case Study Analysis: The Hypothesis SA Tool For the qualitative data analysis we chose the following units of analysis which emerged from reading across cases [33]: categories of functionalities, user roles, and types of use.

To give concrete example of tool, theory and pedagogy interacting, we use Hypothesis as an exemplar case. This is an example of a tool and how it relates to the theoretical concepts presented. These tools enable so-called epistemic engagement – in other words, the jointly constructed knowledge which arises from dialog (Zheng & Warschauer, 2017).

4.4.1 Theoretical Alignment and Functionality

Hypothesis is the annotation tool that enables users to highlight and take notes on a given website, PDFs and video in a shared layer. It natively operates with the most important frameworks:

Multiliteracies: It supports interaction with different text modes (text articles, digital images and moving image), allowing discussion which make use of linguistic and visual modes.

Metaliteracy: It renders the critical reading process transparent, and provides a space for evaluating sources, debating interpretations, and engaging in the production of knowledge.

Socio-Cognitive Theory: It conceives reading as a social, dialogic process. Elements such as tagging peers and “threaded replies” support a community of inquiry (CoI) in which knowledge is collaboratively constructed (Kern, 2014).

4.4.2 Evidence of Outcomes and Application in Teaching

Reported implementations report results such as better retention, understanding, and grades. It is especially pertinent in the era of generative AI, whose content creation still forcefully “speaks human” via “human-centered,” active reading and peer dialogue tasks that are not so easily shortcut by AI. In terms of EFL pedagogy, Experimento provides a framework for scaffolding digital literacy:

Pre-Reading: Teachers can seed texts with prompts for predictions or vocabulary.

While reading: Readers can annotate rhetorical moves/ main ideas / confusions in order to make their reading strategies visible.

After Reading: Threads can develop into cooperative summaries or critical discussions, scaffolding powerful strategies in a nurturing environment.

This point highlights the heart of this review: the tool is only valuable if an instructor’s pedagogical design is efficient at building meaningful prompts, modeling high-level annotation activity, and integrating it as a component into larger learning goals.

5. Conclusion

The present review has integrated both empirical and theoretical literature of the last 15 years to further describe this interdependence between DL and EFL reading-skill acquisition. The

data make it very clear that digital literacy is no longer an optional skill but a center stage competence, one which re-centers L2 reading itself. Effective integration, as demonstrated in a variety of research studies, is not simply tool-based, but theory driven pedagogy and practice. Conceptual frameworks, including multiliteracies, metaliteracy, and certain socio-cognitive theories offer the essential cutting-edge lenses through which digital reading on social annotation and multimodal platforms as well as mobile applications for example can become a literacy practice rather than a technical task. The continuing mediating role of the teacher - as a designer and facilitator of these technology-mediated interactions As Chun, Kern & Smith (ibid) contend, 'technology is inextricable from the ecology of language use, learning' increasingly emerges here as crucial determinant), So pedagogical design trumps technological affordance becomes privileged'.

6. Future Research Directions

Although such a review brings together much solid progress, it would now be valuable to follow on with future syntheses using meta-analytical tools (compare some work in related territories: e.g., Zhang & Ma, 2022), both to place overall claims about effects and also to push at the boundaries of our field thus far. The following trajectories should be considered in future studies:

Longitudinal and ecological validity: There is an urgent need for longitudinal research to monitor the long-term effects of digital literacy practices on academic reading proficiency as well as learner autonomy over semesters or years. The research focus should also shift from controlled experiments to more ecological, design-based research that is conducted within genuine classrooms so as to appreciate the complexities of implementation.

Teacher Cognition and Professional Development Models: The relationship among teachers' belief systems, the digital pedagogical knowledge (TPACK), and their classroom practice needs to be investigated further. Research must continue to refine and test scalable professional development models that facilitate

the transition of teachers from tool user to a critical digital literacy pedagogue, focusing on "how" as well as the "why and when one should use for varying literacies goals.

Innovation Assessment: A significant deficit remains regarding how to measure the multifaceted effects of digital literacy. Future scholarship must design and validate genuine assessment tools and strategies that accommodate (and measure) collaborative meaning-making, news source critique, multimodal synthesis, ensuring assessments function reflect the new literacies we seek to cultivate.

Encounters with Emerging Technology: With generative AI and immersive technologies becoming more widespread, research must shift to the study of AI literacy in language learning, including establishing AI literacy or the capacity to deploy and critically assess AI-powered tools as co-collaborators in the learning process (Godwin-Jones, 2022). This includes considering the ethical and strategic use of AI as a partner in reading (Showers et al, questioning; summarization) for EFL learners -and how pedagogy must grow to foster critical discernment with such potent tools.

Equity and Context-Specific Frameworks: Research should also strive to explore the second-level digital divide of inequality in high-order critical skills and to create context-specific frameworks for low-resource environments or special populations (e.g., young learners, ESP). This will facilitate meaningful and applicable digital literacy taking place across the EFL world.

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