Digital Engagement and Reading Comprehension in Online EFL/ESL Contexts: A Systematic Literature Review

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DOI: https://doi.org/10.47772/IJRISS.2026.101000849

Received: 02 November 2026; Accepted: 07 November 2026; Published: 20 November 2026

ABSTRACT

This systematic literature review synthesizes evidence on the relationship between digitally mediated reading, learner engagement, and reading comprehension in English as a foreign or second language (EFL/ESL) education. A supplied Scopus CSV export was screened at the title-and-abstract level. Of 50 unique records published between 2021 and 2026, 38 met the review criteria: English-language studies or reviews that addressed digitally mediated reading in an EFL/ESL or L2 context and reported, theorized, or directly informed reading comprehension, engagement, motivational, strategy, or related reading outcomes. The corpus was dominated by university-based EFL studies and by interventions using online reading circles, computer-assisted interactive reading, mobile or e-book reading, collaborative platforms, annotation, and strategy scaffolds. Across the corpus, digital environments were most consistently linked to comprehension when they structured interaction, prompted metacognitive strategy use, offered targeted scaffolds, or supported self-regulated reading. Engagement was operationalized unevenly, commonly through motivation, attitude, self-efficacy, perceived usefulness, or behavioral participation rather than a coherent multidimensional construct. Evidence directly relevant to vocational/technical and vocational education and training (TVET) learners was extremely limited: one cadet-focused record was identified, while most studies sampled general secondary or university populations. The review therefore identifies a substantive contextual gap rather than an absence of digital-reading research. Future research should test theoretically explicit engagement mechanisms and transferability in vocational/TVET EFL settings using robust, longitudinal, and mixed-method designs. Because the available dataset did not include the original Scopus query, database-search date, or full texts, this manuscript is an abstract-level systematic synthesis and should be updated with those audit details before submission.

Keywords: Digital Reading; Online Reading; Learner Engagement; Reading Comprehension; EFL; ESL; Vocational Education; Systematic Literature Review

INTRODUCTION

Reading in English increasingly occurs through digital texts, platforms, mobile devices, multimedia resources, and collaborative online spaces. These environments can expand access to texts and feedback, but their educational value is not inherent in the medium. Their effects depend on the reading task, scaffolding, learners' strategic behavior, and the forms of cognitive, behavioral, and affective engagement they invite. For EFL/ESL learners, this issue is especially salient because comprehension draws simultaneously on language knowledge, reading strategies, vocabulary support, and sustained participation.

The supplied Scopus corpus illustrates the breadth of the field. Studies investigate online reading circles, gamified e-reading, digital annotation, mobile-assisted reading, computer-assisted interactive reading, online discussion, multimedia e-books, mind mapping, and self-regulated online reading. Yet this breadth has made the relationship among digital engagement, reading comprehension, and learner context difficult to consolidate. Research may describe engagement through attitudes, motivation, self-efficacy, participation, or self-regulation without examining engagement as an integrated construct.

Digital reading is more than the presentation of a conventional passage on a screen. It can include hyperlinks, embedded glosses, machine translation, annotation, multimodal cues, dashboard feedback, shared discussion spaces, and mobile-device portability. These features may improve access to language and invite purposeful interaction with texts, but they can also create navigation demands, distractions, and competing sources of information. A simple comparison of print and screen therefore leaves the central pedagogical question unanswered. The more informative question is what learners are required to do with the text, what support is available when comprehension breaks down, and whether that support develops independent reading practices.

Reading comprehension itself is a layered outcome. L2 readers need to recognize vocabulary and grammatical relationships, connect propositions across sentences, monitor coherence, make inferences, and integrate prior knowledge. A digital affordance can influence these components in different ways. A glossary may reduce lexical barriers; a structured annotation task may direct attention to evidence; a peer discussion may support inference and explanation; and a progress indicator may encourage persistence without necessarily strengthening meaning construction. This distinction is essential because the records use related but non-identical outcomes, including reading proficiency, reading performance, critical thinking, strategy use, and comprehension.

Engagement provides a plausible bridge between a digital design and reading outcome, but it must be used precisely. Behavioral engagement concerns participation and persistence; cognitive engagement concerns strategic and effortful processing; affective engagement includes interest, confidence, enjoyment, and anxiety; and agentic engagement concerns learners' constructive contribution to the learning process. The supplied records refer to motivation, attitude, self-efficacy, interaction, perceived usefulness, and self-regulation. These terms may be associated, but no single term can stand in for all dimensions. This review therefore interprets engagement as a family of reported processes while retaining the construct labels used by the individual studies.

This conceptual distinction is particularly important for EFL/ESL learners. A learner may be highly engaged yet still struggle if lexical and syntactic demands exceed available resources. Conversely, a translation, summary, or annotation tool may raise immediate task performance without producing strategic independence. The educational value of digital support should therefore be assessed against a stated learning purpose, the characteristics of the text, and evidence of transfer or delayed comprehension. Adoption, satisfaction, and screen time are useful contextual indicators, but they are not sufficient indicators of learning.

The vocational/TVET dimension sharpens this problem. Vocational learners often read discipline-relevant, technical, procedural, and workplace-oriented texts, yet the present export contains little direct evidence from vocational institutions. Rather than treating this as proof that no research exists, this review examines the available EFL/ESL digital-reading evidence and identifies the degree to which it can—or cannot—support claims about vocational contexts.

The review makes two contributions. First, it maps a recent set of Scopus-exported records in which digital or online reading intersects with L2 English learning. Second, it distinguishes evidence about digital delivery from evidence about the instructional activities enabled by a platform. That distinction supports a more defensible conclusion for vocational education that shows the gap is not an absence of digital-reading research, but the shortage of studies that test engagement-oriented digital reading with vocational learners, vocational purposes, and authentic technical texts.

1.1 Review Aim and Questions

This systematic review addresses these limitations by synthesising empirical research and reviews on digitally mediated reading in EFL/ESL contexts published between January 2021 and August 2026. Three research questions guide this synthesis:

RQ1 - What digital-reading approaches and learning contexts are represented in recent EFL/ESL research? RQ2 - How are engagement-related constructs operationalized, and how are they linked to reading-comprehension outcomes?

RQ3 - What evidence is available for vocational/TVET learners, and what research gap follows?

METHOD

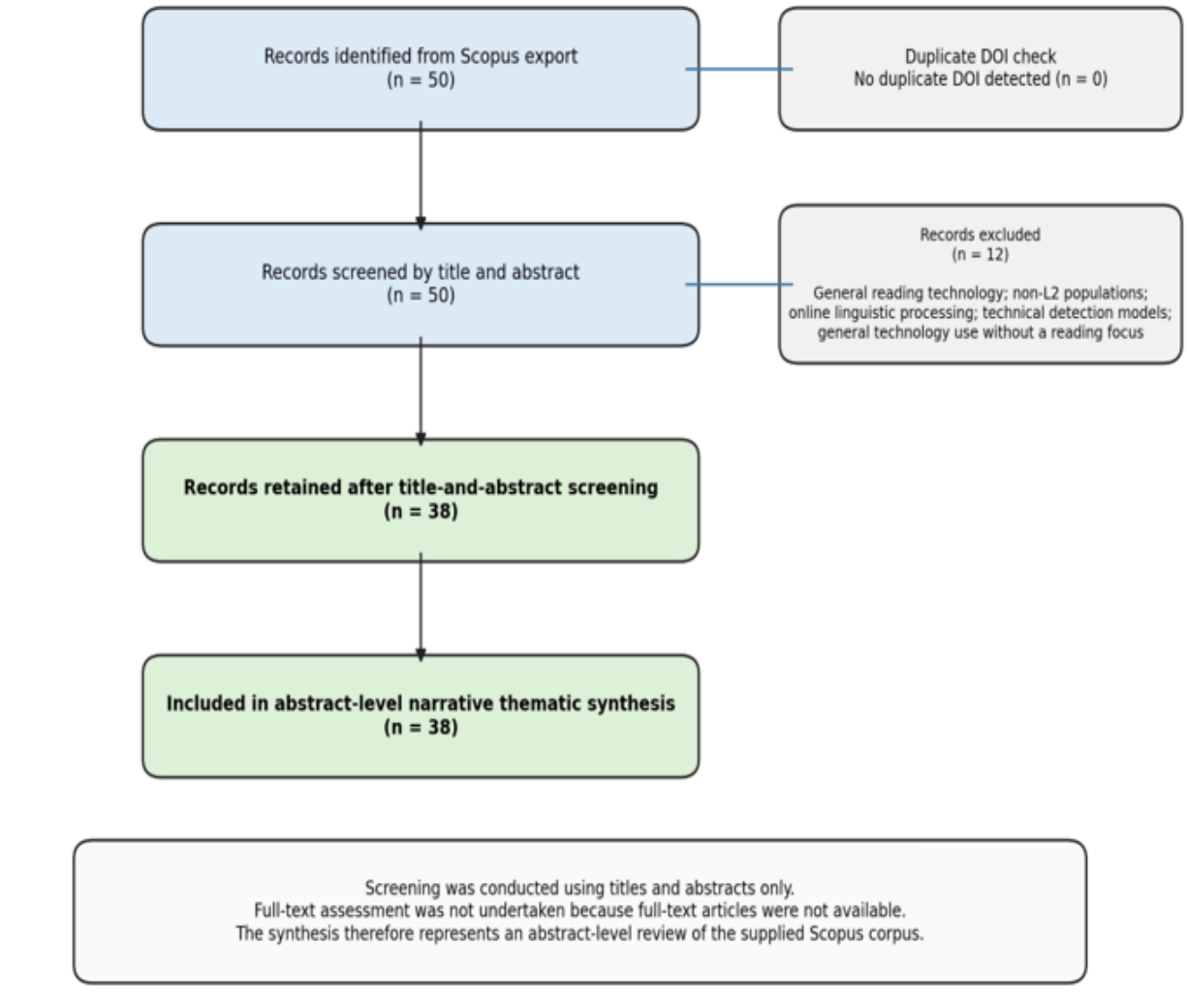
2.1 Design and Reporting Orientation

The study adopted a systematic literature review (SLR) approach, guided by PRISMA principles, to examine recent research on digital reading approaches and learner engagement in English as a Foreign Language (EFL) and English as a Second Language (ESL) contexts. The review employed a title and abstract screening procedure based on a user-supplied Scopus database export. Specifically, the dataset contained bibliographic information and abstracts for all retrieved records. However, the full-text articles and the original Scopus search history were not available. Therefore, the review was conducted at the abstract level, with the synthesis focusing on the research pattern, digital reading approaches, and findings explicitly reported in the available abstracts.

A systematic approach was adopted to ensure transparency and consistency in the identification, screening, and selection of relevant studies. PRISMA principles informed the reporting of the data source, eligibility criteria, screening procedures, and study selection outcomes. Nevertheless, the application of PRISMA principles should be understood within the limitations of the available dataset. As the original search strategy and database retrieval records were not provided, the review could not independently verify the comprehensiveness of the initial search. Furthermore, the review protocol was not prospectively registered. Accordingly, the findings are presented as a synthesis of the supplied corpus rather than an exhaustive representation of all relevant publications in the field.

Figure 1

PRISMA-Style Flow of Study Selection



Source: Authors' own compilation based on the supplied Scopus dataset.

2.2 Data Source and Search Provenance

The dataset comprised one Scopus CSV export containing 50 records. It was exported on 25 August 2026 according to the filename and covered publications dated 2021–2026. The CSV preserves the Scopus search string, database-search date, filters, and the number of records before export. These elements are explicitly retained as for reporting. The source should be supplemented before submission by pasting the exact Scopus Advanced Search strings and the date searched into Appendix A.

A reproducible update should use a staged search approach. A core search can combine digital or online reading terms, reading-comprehension terms, and EFL/ESL or second-language terms. Separate supplementary searches should retrieve engagement-related constructs and vocational/TVET populations. Requiring every concept within the same title, abstract, or keyword field may exclude relevant records because authors use terms such as online learning, mobile-assisted reading, self-regulation, tertiary education, technical English, or college learners rather than the exact phrase "digital engagement" or "vocational." The separate result sets should then be deduplicated and screened using a pre-specified protocol.

2.3 Eligibility Criteria

Table 1: List of eligibility criteria

Criterion	Included	Excluded
Population/context	EFL, ESL, L2, or English learners in educational contexts	Non-language-learning populations or no discernible L2/English-learning relevance
Phenomenon	Digital, online, computer-assisted, mobile, e-book, multimedia, or platform-mediated reading	Online language processing not framed as digital learning; generic technology studies without a reading focus
Outcomes	Reading comprehension/performance/proficiency or engagement, motivation, attitudes, strategy use, self-regulation, or closely related reading outcomes	Studies lacking a usable reading-learning or engagement outcome
Document/date	Scopus-indexed records in the supplied export, 2021–2026	Records outside the supplied export or duplications

2.4 Screening and Extraction

For each included record, the review retained the author, year, title, source, DOI, document type, abstract, keywords, tool category, study design, country or context when stated, and relevant outcome categories. Data were extracted for publication year, setting, population where stated, digital approach, engagement-related construct, and reported outcome. Twelve records were excluded because they concerned general reading technology, non-L2 populations, online linguistic processing, a technical detection model, or broad technology use without sufficient alignment to the review focus. Consequently, 38 records were retained for the final synthesis.

Extraction privileged information stated in the bibliographic record and abstract. When an abstract identified an intervention, learner group, duration, or outcome, that information was synthesized descriptively. When detail was absent, it was not inferred from the title, journal, or country of affiliation. The review did not rate risk of bias, attrition, effect sizes, or statistical precision because abstracts did not reliably supply the necessary information. This conservative approach prevents false precision, while also limiting causal conclusions and making full-text appraisal a necessary next step before publication.

The broad eligibility criteria were intentional. They captured comprehension studies as well as work on strategy use, motivation, self-regulation, reading attitudes, interaction, and related cognitive processes. This breadth helps identify candidate engagement mechanisms but produces a heterogeneous corpus. Counts by intervention cluster

are therefore descriptive and should not be read as evidence that one approach is superior to another. A later full-text review should refine categories, use dual screening, and report agreement between reviewers.

2.5 Synthesis Approach

A narrative thematic synthesis grouped studies by digital reading approach and engagement mechanism. Counts are descriptive rather than meta-analytic because the abstracts reported heterogeneous designs, outcomes, and measures. “Engagement” is used cautiously as an umbrella term for the constructs actually named in each study (e.g., motivation, attitudes, participation, self-efficacy, self-regulation, or interaction).

3. Results

Table 2: Study Selection

PRISMA-oriented stage	Records (n)
Records in supplied Scopus export	50
Duplicate records removed	0
Title/abstract records screened	50
Records excluded at title/abstract stage	12
Records included in narrative synthesis	38

Note. The original database search yield and the search-date metadata were not available in the CSV export; the flow begins with the supplied export.

Table 3: Publication Profile

Publication year	Included records (n)
2021	2
2022	6
2023	7
2024	6
2025	13
2026	4

The included corpus was recent and concentrated in 2024–2026. Most records were journal articles; the export also included one review, one book chapter, and one conference paper. This recency suggests an active field but also cautions against interpreting the observed pattern as a mature, stable evidence base.

The recent concentration of publications likely reflects the normalization of online and hybrid learning in the first half of the 2020s. It should not be interpreted as evidence that every approach is novel. Many records extend established traditions of computer-assisted language learning, extensive reading, metacognitive strategy instruction, collaborative learning, and multimedia design. What appears to be expanding is the range of accessible platforms and the ease with which reading tasks can be embedded in online or blended instructional routines. This contextual trend makes theory-driven evaluation especially important and availability should not be confused with demonstrated learning value.

RQ1 - What digital-reading approaches and learning contexts are represented in recent EFL/ESL research?

Table 4: List of approach clusters, illustrative studies, and synthesis

Approach cluster	Illustrative studies	Synthesis
Interactive/collaborative online reading	Wei (2025); online peer discussions; online discussion	Online reading circles, peer discussion, and collaboration were commonly associated with

	forum; digital collaborative learning	stronger comprehension, critical thinking, participation, or favorable learner responses.
Computer-assisted scaffolding and strategy instruction	Computer-assisted interactive reading; online strategy training; digital mind maps; highlights/annotations	Positive outcomes were typically attributed to explicit scaffolds, strategy prompts, annotation, or structured interaction rather than screen exposure alone.
Mobile, e-book, and multimodal reading	Kaban (2021); mobile-assisted reading; video-based e-book; virtual literature circles	Studies examined format, multimedia, gamification, and mobile access. Outcomes varied with cognitive load, task design, and learner attitudes.
Self-regulation and reading strategies	Metacognitive strategy training; online reading determinants; self-regulated online reading	Strategic and self-regulated engagement emerged as recurrent explanatory mechanisms for online comprehension.
Tools for academic/technical reading	Digital annotation for English for Science and Technology texts; machine translation; online resources	These studies point to the relevance of vocabulary and comprehension supports for disciplinary texts, although they were not conducted specifically in TVET institutions.

The findings presented in Table 4 indicate that recent EFL/ESL research has explored several digital reading approaches to enhance learners' reading experiences and comprehension. These approaches include interactive and collaborative online reading, computer-assisted scaffolding, mobile and multimedia reading, and self-regulated reading strategies. Interactive activities, such as online reading discussions, peer collaboration, and digital reading forums, provide opportunities for learners to exchange ideas, interpret texts, and develop critical thinking skills. Meanwhile, computer-assisted approaches incorporate instructional support, strategy prompts, digital mind maps, and annotations to guide learners in understanding reading materials. These approaches suggest that digital reading becomes more meaningful when learners are actively engaged in the reading process rather than merely exposed to digital texts.

In addition, mobile-assisted reading, e-books, video-based materials, and virtual literature circles offer flexible and multimodal learning experiences that can accommodate learners' different needs and preferences. As illustrated by Kaban (2021), digital reading environments may incorporate multimedia features, gamification, and mobile accessibility to encourage learners' engagement and positive attitudes towards reading. Another important aspect is the development of self-regulation, whereby learners are encouraged to monitor their reading progress, apply appropriate strategies, and manage their own learning. Furthermore, digital tools such as annotation applications, machine translation, and online resources can provide additional support for academic and technical reading. These tools are particularly useful in helping learners understand discipline-specific texts by strengthening their vocabulary knowledge and reading comprehension, although the existing studies have not specifically focused on TVET institutions. Overall, the reviewed studies highlight the importance of combining technological resources with effective instructional guidance, learner interaction, and self-regulated learning. Therefore, successful digital reading practices should focus not only on providing access to digital materials but also on creating interactive, supportive, and purposeful learning environments that promote reading comprehension, vocabulary development, and learner autonomy.

RQ2 - How are engagement-related constructs operationalized, and how are they linked to reading-comprehension outcomes?

The studies did not use a single definition of engagement. Engagement-related evidence appeared as behavioral participation in circles or discussion, affective attitudes toward e-reading, motivation for online reading, self-efficacy, perceived usefulness, learner-to-learner interaction, and self-regulation. This heterogeneity matters: a positive attitude or preference for a digital tool should not be treated as equivalent to sustained behavioral engagement or deep cognitive engagement.

Behavioral engagement was most visible in work involving reading circles, peer discussions, online forums, and collaborative learning. These designs make participation observable through contributions, interaction, or

role completion. Their potential advantage is that interpretation becomes a social process: learners explain a text, encounter alternative readings, and must justify their views. Nevertheless, the quantity of participation does not establish the quality of processing. Future studies should link interaction traces to the content of contributions and to independently measured comprehension rather than treating message counts or attendance as sufficient evidence of engagement.

Cognitive engagement appeared frequently through strategy-oriented interventions. Online strategy training, metacognitive reading strategies, digital mind mapping, highlights, and annotation are intended to make comprehension monitoring visible and actionable. These approaches are theoretically plausible because they direct attention to coherence, evidence, vocabulary, and organization. Yet a platform can offer a feature without ensuring that learners use it strategically. Future reports should distinguish between a tool being available, a tool being used, and a tool being used in a way that improves comprehension.

Affective and motivational engagement was commonly represented by attitudes, interest, self-efficacy, perceived usefulness, reading anxiety, or preferences for a particular mode. These measures reveal whether learners accept and value an activity, but they should be interpreted alongside performance data. Positive attitudes may encourage persistence, while anxiety or cognitive overload may reduce it. Immediate enjoyment is not, however, equivalent to deep learning. Evaluations should examine whether affective responses predict sustained participation and whether sustained participation translates into durable comprehension outcomes.

Self-regulation is an especially important cross-cutting mechanism. Online reading can require learners to set goals, allocate time, manage distractions, choose supports, monitor understanding, and decide when to reread. The records addressing online determinants, metacognition, and self-regulated learning underscore this role. Self-regulation may be both an outcome of well-designed instruction and a precondition for benefiting from digital tasks. Studies should therefore measure baseline self-regulatory capability rather than assume that all learners engage with a platform in the same manner.

Despite this measurement variation, the corpus supports a consistent conditional pattern. Digital reading was most promising when instructional design elicited purposeful interaction with text: reciprocal discussion, annotation, metacognitive prompts, strategy training, feedback, or collaboration. For example, the online reading-circle study by Wei (2025) reported higher comprehension and favorable self-efficacy, behavioral engagement, perceived usefulness, and affective responses. The gamified e-reading study by Kaban (2021) reported higher comprehension and more positive attitudes, while also noting learners' continuing preference for print for leisure. Such findings support a design-based interpretation: technology can support engagement and comprehension when it changes learners' reading activity, not simply their display surface.

Several records also foreground possible constraints. Mobile versus paper-based comparisons address cognitive-load differences; multitasking digital reading addresses working-memory demands; and work on reading anxiety highlights motivational pathways. These studies suggest that the relation between digital reading and comprehension is moderated by learner characteristics, cognitive resources, and the quality of platform scaffolding. The supplied abstracts do not permit a pooled estimate of effect size or a causal ranking of interventions.

RQ3 - What evidence is available for vocational/TVET learners, and what research gap follows?

Direct vocational/TVET evidence was sparse. One included study addressed cadets' synchronous online reading and self-regulated learning; several others concerned higher education or English for Science and Technology texts. However, the corpus predominantly used general university, school, or unspecified EFL populations. It therefore cannot establish that interventions effective in mainstream tertiary EFL courses transfer to vocational colleges, apprenticeship pathways, or technical programs. A defensible gap statement is that recent research has examined digital reading, engagement-related processes, and reading comprehension among EFL/ESL learners, but limited research integrates these dimensions in vocational/TVET contexts.

The limited TVET representation has methodological as well as substantive implications. Vocational learners should not be treated simply as a demographic subset of tertiary students. Their reading purposes may include

task completion, safety compliance, technical troubleshooting, certification preparation, or workplace communication. These purposes may alter the meaning of comprehension, the usefulness of a digital support, and the motivational consequences of success. A vocationally responsive study should specify occupational field, text genre, target-language demand, assessment task, and the relationship between the reading activity and authentic practice.

DISCUSSION

4.1 What does the evidence indicate?

The review indicates that digital engagement is not a standalone intervention. It is better understood as a set of learner responses and practices produced by particular designs. Online circles and peer discussions may increase behavioral participation and dialogic processing; annotation and strategy prompts may encourage cognitive engagement; gamification, perceived usefulness, and supportive feedback may contribute to affective or motivational engagement; and self-regulation supports sustained task management. Reading comprehension is consequently most plausibly improved through these mediating processes rather than through digital delivery alone.

A useful explanatory framework is design engagement process comprehension outcome, with learner and context characteristics acting as moderators. Design includes platform affordances, task sequence, text features, feedback, and social organization. Engagement processes include attention, persistence, strategic monitoring, interaction, confidence, and self-regulation. Outcomes may include immediate comprehension, transfer to new texts, vocabulary growth, critical literacy, and reading-related dispositions. Moderators include proficiency, prior digital experience, access to devices, working memory, anxiety, and the disciplinary character of the text. This framework does not assume that every pathway operates in every study; it offers a way to make plausible mechanisms visible and testable.

The model clarifies the difference between support and substitution. Glosses, translations, multimedia cues, and annotation can lower barriers to comprehension. Their educational value is greatest when they help learners notice, interpret, and later manage comparable difficulties independently. Substitution occurs when a tool provides an answer without requiring a learner to construct a representation of the text. Digital-support studies therefore need to report how assistance is sequenced, whether learners verify outputs, whether supports are faded over time, and whether comprehension persists when the support is removed.

A balanced interpretation of technology is required. Digital environments can make texts accessible, interactive, and collaborative, but they can also fragment attention, invite multitasking, and add unfamiliar navigation demands. The implications are pedagogical, not deterministic. Teachers can reduce unnecessary load by selecting readable interfaces, limiting irrelevant multimedia, setting clear reading purposes, and teaching students when and how to use supports. Digital traces may be valuable for reflection and feedback, but logged activity should not be mistaken for learning without accompanying evidence of comprehension.

This interpretation reconciles apparently mixed evidence about formats. Studies that compare mobile, paper, or multimedia reading may reveal advantages, neutral effects, or cognitive burdens depending on text design and task demands. By contrast, interventions that explicitly organize learner activity—such as strategy training, interactive reading models, and structured discussion—more directly specify the pedagogical mechanism. Future studies should name and measure these mechanisms before claiming that a platform itself improves comprehension.

4.2 Implications for Vocational/TVET English Education

The limited TVET representation is consequential, not merely a sampling gap. Vocational English reading often involves technical manuals, safety guidance, work orders, specifications, and workplace documentation. These texts may require terminology support, visual-text integration, procedural sequencing, and applied comprehension checks. The corpus offers transferable design hypotheses—collaborative reading, annotation, metacognitive prompts, and self-regulation—but their effectiveness should be tested with authentic vocational

texts and vocational learner populations. Designers should avoid assuming that broad university EFL evidence applies unchanged to TVET settings.

For practice, a cautious translation of the evidence is possible. A vocational English instructor might use an online reading circle around a safety procedure, a digital annotation activity for a technical manual, or collaborative mind mapping of a troubleshooting guide. Each activity should have an explicit comprehension target, such as identifying a condition, sequencing a procedure, distinguishing warnings from recommendations, or justifying a decision with textual evidence. Engagement indicators should then match the activity: contribution quality, strategic annotations, goal monitoring, confidence, or persistence through a complex text.

For research, vocational transfer should be treated as an empirical question. Studies can compare generic EFL digital-reading tasks with vocationally contextualized versions while holding instructional structure constant. They can test whether terminology glosses, diagrams, peer roles, or self-regulation prompts function differently in fields such as engineering, hospitality, health, or information technology. Mixed methods are particularly valuable because performance data alone may conceal why a support was useful, ignored, or experienced as distracting. Learner interviews and stimulated recall can show how readers navigate the relationship between language difficulty and workplace relevance.

4.3 Research Agenda

Three priorities follow. First, define engagement multidimensionally and distinguish behavioral, cognitive, emotional, and agentic dimensions; report validated measures alongside trace data such as annotations, time-on-task, and interaction logs. Second, conduct vocational/TVET studies using authentic disciplinary texts, comparison conditions, and pre-specified comprehension outcomes. Third, use longitudinal and mixed-method designs to explain how learners' language proficiency, reading anxiety, cognitive load, access conditions, and self-regulation moderate outcomes. These steps would shift the literature from testing tools toward explaining conditions for effective digital reading.

A stronger study design begins with a theory of change. Researchers should state which digital feature is expected to influence which engagement process and why that process should improve a defined comprehension outcome. Measures should then correspond to that theory: a self-regulation scale and annotation quality for cognitive engagement, discussion coding for behavioral and dialogic engagement, and delayed comprehension tests for learning. Baseline language proficiency and prior digital-reading experience should be recorded when possible, so differences are not attributed to an intervention when they may instead reflect pre-existing variation.

Evidence quality will improve when studies distinguish short-term task performance from learning. A learner may answer questions accurately while using a tool yet show no independent comprehension later. Delayed post-tests, transfer texts, think-aloud protocols, and stimulated recall can help establish whether supports change reading processes. In vocational settings, applied outcomes such as correctly following a procedure or identifying safety-critical information may complement conventional comprehension tests, provided that they remain transparently tied to the source text and do not simply assess prior occupational knowledge.

Future evidence syntheses should also strengthen reproducibility. Reviews should archive exact queries, use multiple databases where feasible, deduplicate transparently, employ dual screening and extraction, appraise study quality, and report exclusions with reasons. Once sufficient comparable interventions are available, meta-analysis or meta-regression may estimate whether specific design features are associated with comprehension outcomes. Until then, a careful narrative synthesis that separates mechanisms, contexts, and outcome types is more defensible than a pooled estimate built from incompatible measures.

LIMITATIONS

This review is constrained by its evidence source. It relied on a single supplied Scopus export, not a rerunnable multi-database search such as the original search strings, filters, and search date were absent. Screening and extraction were conducted at the abstract level by one reviewer, and no full-text appraisal, risk-of-bias assessment, or effect-size synthesis was possible. The inclusion set nevertheless provides a transparent and useful

mapping of the supplied corpus. Claims in this manuscript are correspondingly limited to reported abstracts and should be strengthened through full-text retrieval, dual screening, critical appraisal, and a completed PRISMA 2020 checklist.

CONCLUSION

Recent EFL/ESL research contains a substantial and growing body of work on digital reading and comprehension. The strongest common implication is that digitally mediated reading supports comprehension when it is designed to prompt meaningful interaction, strategy use, collaboration, feedback, or self-regulation. Engagement is central but inconsistently defined and measured. The principal research gap is not the absence of digital-reading research; it is the scarcity of studies connecting digital engagement, online English reading, comprehension, and vocational/TVET learners in the same design. This gap justifies focused vocational research while drawing carefully, rather than uncritically, on the wider tertiary EFL evidence base.

ACKNOWLEDGEMENTS

The authors acknowledge Universiti Teknologi MARA (UiTM) for providing institutional access to the online databases used in this review. The authors also gratefully acknowledge Associate Professor Dr Azilawati Banchit of UiTM Cawangan Sarawak for her mentorship and scholarly guidance throughout the study.

Funding Information

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The authors declare no conflict of interest.

Author Contribution

Saripah Sinas (Conceptualisation, Methodology, Investigation, Data Curation, Formal Analysis, Project Administration, Writing - Original Draft)

AI-Use Declaration

During the preparation of this manuscript, the authors used OpenAI's ChatGPT and Codex as supplementary tools to refine the review questions and search strategy, organise the extracted data, thematic synthesis, enhancement of language and structural coherence, and format the manuscript in accordance with the journal's guidelines. The authors evaluated, independently verified, and revised all AI-assisted outputs, including the interpretation and synthesis of findings, in-text citations, references, tables, and figures. The AI tools were used to support the writing and research process and were not regarded as authors or as independent contributors to the scholarly interpretation or conclusions of the study. The authors retain full responsibility and accountability for the accuracy, originality, academic integrity, and final content of the manuscript.

Supplementary Material

Supplementary Material S1 contains the cleaned Scopus bibliographic export, title-and-abstract screening decisions, full-text decisions, included-study characteristics, the study-level data-extraction matrix, quality-appraisal results, excluded full-text studies with reasons, the coding dictionary, review protocol, and completed PRISMA 2020 checklist. The underlying publisher PDFs are not redistributed.

REFERENCES

1. Abdelshaheed B. (2024). Digital Collaborative Learning: Promoting Reading Comprehension and Vocabulary among Saudi University English Majors. Arab World English Journal. 2024-July(Special Issue), 118-133. https://doi.org/10.24093/awej/call10.9

2. Ahmad D.R.P., Widiati U., Laksmi E.D., Muniroh S., Istiqomah D.M. (2026). From Reading Comprehension to Critical Literacy: Adapting Huh's Model in Online Indonesian EFL Classrooms. Online Learning In Educational Research. 6(2), 39-54. https://doi.org/10.58524/oler.v6i2.1087
3. Alahmadi N.S. (2024). Examining the Impact of a Digital Reading Progress Tool on Saudi L2 Learners' Reading Aloud Performance and Proficiency. International Journal of Arabic-English Studies. 24(2), 205-230. https://doi.org/10.33806/ijaes.v24i2.661
4. Alhawsawi S., Alhamad M., Almehdar K.S., Ahmed M.E. (2025). ReadWorks in Action Research to Enhance Reading Skills for University EFL Students.. Arab World English Journal. 2025-July(Special Issue), 288-308. https://doi.org/10.24093/awej/call11.18
5. Anggraini M.P., Cahyono B.Y., Anugerahwati M., Ivone F.M. (2022). The interaction effects of reading proficiency and personality types on EFL university students' online reading strategy use. Education and Information Technologies. 27(6), 8821-8839. https://doi.org/10.1007/s10639-022-10979-9
6. Azmuddin R.A., Jamalai M., Rahim A.A.A., Ali M.M.A., Khamis N.Y. (2022). EXPLORATION OF ONLINE DISCUSSION FORUM ON READING EST TEXTS FOR ESL LEARNERS. Malaysian Journal of Learning and Instruction. 19(2), 97-122. https://doi.org/10.32890/mjli2022.19.2.4
7. Azmuddin R.A., Sulaiman N.A., Jamali M.J., Rahman A.N.C.A., Roslan F.H. (2025). The Use of Digital Annotation Tools in Assisting Reading English for Science and Technology Academic Texts among L2 Learners in Higher Institutions. 3L: Language, Linguistics, Literature. 31(1), 235-254. https://doi.org/10.17576/3L-2025-3101-16
8. Babashamasi P., Kotamjani S.S., Noordin N.B. (2022). The Effect of Explicit Training of Metacognitive Reading Strategies on Online Reading Comprehension. Arab World English Journal. 2022-July, 246-261. https://doi.org/10.24093/awej/call8.17
9. Bahari A., Zhang X., Ardasheva Y. (2021). Establishing a computer-assisted interactive reading model. Computers and Education. 172, https://doi.org/10.1016/j.compedu.2021.104261
10. Cancino M., Gonzalez N. (2023). Exploring Reading Attitudes, Reading Self-Efficacy, and Reading Proficiency in a Blended Learning Context Among EFL Learners. Journal of Language and Education. 9(4), 31-45. https://doi.org/10.17323/jle.2023.16303
11. Chen T.-H. (2023). Is a Video Worth a Thousand Words? Enhancing Second Language Reading Comprehension Through Video-Based E-book Design and Presentation; [一個影片勝過千言萬語? 探討動態影片電子書設計和呈現模式如何提升第二語為英語學習者的閱讀理解]. English Teaching and Learning. 47(1), 69-93. https://doi.org/10.1007/s42321-022-00107-8
12. Chung E.S. (2023). L2 Learners' Use of Raw Machine-Translated Output in Reading Comprehension. CALL-EJ. 24(3), 1-19.
13. de Azevedo B., Oliveira D.A., Finger I., Tomitch L.M.B. (2025). Working memory capacity as a predictor of text idea recall in multitasking L2 digital reading. Psicologia: Reflexao e Critica. 38(1), https://doi.org/10.1186/s41155-025-00353-2
14. Drobisz J., Park S., Smith G. (2026). The role of arousal in L2 readers' engagement and comprehension during pedagogical agent–guided online reading. Language Learning and Technology. 30(1), https://doi.org/10.64152/10125/73694
15. Du J. (2025). The Correlation between First and Second Language Strategies and Reading Comprehension among Chinese International Students in an Online Reading Environment. Forum for Linguistic Studies. 7(5), 148-180. https://doi.org/10.30564/fls.v7i5.8668
16. Habók A., Oo T.Z., Magyar A. (2025). Comparative study of the use of online reading strategies in the L1 and L2. Frontiers in Education. 10, https://doi.org/10.3389/feduc.2025.1625347
17. Kaban A.L. (2021). Gamified E-Reading experiences and their impact on reading comprehension and attitude in EFL classes. International Journal of Mobile and Blended Learning. 13(3), 71-90. https://doi.org/10.4018/IJMBL.2021070105
18. Kaowiwattanakul S. (2025). Multimodal literature and CEFR reading proficiency: Improving literary reading skills in EFL learners. Indonesian Journal of Applied Linguistics. 15(1), 20-34. https://doi.org/10.17509/ijal.v15i1.75921
19. Karaarslan A., Polat E. (2025). The effects of digital reading on third grade EFL students' motivation, attitude, reading comprehension, and vocabulary acquisition. Computer Assisted Language Learning. https://doi.org/10.1080/09588221.2025.2599147

20. Khalaf F.J., Wali F.A. (2025). Enhancing students' reading comprehension skills through the use of epic: A comparative study. Blending Human Intelligence With Technology in the Classroom. 69-86. https://doi.org/10.4018/979-8-3373-0771-8.ch004
21. Khunaivi H., Suryati N., Laksmi E.D., Khoiri N.E. (2026). The Effects of Mobile Virtual Literature Circles on EFL Reading Comprehension in Rural Indonesia. International Journal of Information and Education Technology. 16(6), 1538-1546. https://doi.org/10.18178/ijiet.2026.16.6.2619
22. Limbong S., Nursyam, Asdar, Palayukan N., Tandibura F. (2024). Synchronous Online Reading toward Digital Literacy and Higher-Order Thinking Skills Supporting Cadets' Self-Regulated Learning. XLinguae. 17(4), 317-335. https://doi.org/10.18355/XL.2024.17.04.19
23. Maruf N., Husain D., Arifin S., Mujayanah S. (2024). Cognitive processes in EFL learners' reading comprehension: A comparative analysis of WhatsApp and traditional group-driven reading. Indonesian Journal of Applied Linguistics. 13(3), 623-635. https://doi.org/10.17509/IJAL.V13I3.66945
24. Mekheimer M. (2025). Digital mind magnets as a scaffold for improving EFL online reading comprehension. Discover Education. 4(1), https://doi.org/10.1007/s44217-025-00988-4
25. Ounissi A., Romly R., Ahmad Tajuddin A.J., Hasan M.K. (2025). The evolution of online extensive reading and web-based platforms in EFL/ESL: A narrative review of impacts, challenges, and future directions. Australian Journal of Applied Linguistics. 8(1), https://doi.org/10.29140/ajal.v8n1.102592
26. Ran L. (2025). Enhancing specific critical thinking skills among EFL learners through computer-assisted interactive reading model in a CALL environment: An investigation of learner perceptions and performance. Thinking Skills and Creativity. 58, https://doi.org/10.1016/j.tsc.2025.101948
27. Rattanasak S. (2023). The interplay between the Internet-based reading resources and learner-to-learner interactions in blended language learning. Online Journal of Communication and Media Technologies. 13(2), https://doi.org/10.30935/ojcmt/13050
28. Rezai A., Goodarzi A., Liu G.L. (2025). A comparative study of the effects of informal digital learning of English in extracurricular and extramural settings on reading comprehension: a multi-analysis study on Iranian university students. Computer Assisted Language Learning. https://doi.org/10.1080/09588221.2025.2491708
29. Rianto A. (2022). EXPLORING CORRELATION BETWEEN METACOGNITIVE ONLINE READING STRATEGY USE AND ONLINE READING COMPREHENSION OF EFL STUDENTS. Turkish Online Journal of Distance Education. 23, 223-235. https://doi.org/10.17718/tojde.1096448
30. Shang H.-F. (2023). Exploring the Impact of Online Peer Discussions on EFL Reading Comprehension. International Journal on E-Learning: Corporate, Government, Healthcare, and Higher Education. 22(1), 75-101.
31. Sumekto D.R., Taufiqulloh, Aryani M.R.D. (2022). The EFL students' online reading determinants: Perceiving from their selected folklore readings. Indonesian Journal of Applied Linguistics. 11(3), 539-552. https://doi.org/10.17509/ijal.v11i3.36776
32. Uçak G., Kartal G. (2023). Scaffolding design to increase reading comprehension for learners of English through online strategy training. E-Learning and Digital Media. 20(4), 402-423. https://doi.org/10.1177/20427530221111268
33. Wei R. (2025). Promoting EFL learners' reading comprehension and critical thinking through online reading circles activities. Computer Assisted Language Learning. https://doi.org/10.1080/09588221.2025.2496982
34. Xie X., Huang H. (2024). Impacts of reading anxiety on online reading comprehension of Chinese secondary school students: the mediator role of motivations for online reading. Cogent Education. 11(1), https://doi.org/10.1080/2331186X.2024.2365589
35. Yan X., Kim J. (2023). The effects of schema strategy training using digital mind mapping on reading comprehension: A case study of Chinese university students in EFL context. Cogent Education. 10(1), https://doi.org/10.1080/2331186X.2022.2163139
36. Yang X., Hu J. (2024). Distinctions between mobile-assisted and paper-based EFL reading comprehension performance: reading cognitive load as a mediator. Computer Assisted Language Learning. 37(7), 2051-2082. https://doi.org/10.1080/09588221.2022.2143527
37. Zaha A. (2022). Analysis of the Interrelatedness of Self -Regulation, Learners‟ Engagement, and Self-Perceived Development in a Synchronous Online EFL Reading Course. World Journal of English Language. 12(8), 39-48. https://doi.org/10.5430/wjel.v12n8p39

38. Zhang P. (2026). Effects of highlights and annotations on EFL learners' Reading comprehension: an application of computer-assisted interactive reading model. Computer Assisted Language Learning. 39(3), 538-570. https://doi.org/10.1080/09588221.2024.2410166

Appendix A. Scopus Search String

TITLE-ABS-KEY("digital engagement" OR "student engagement"OR "learner engagement" OR "online engagement"OR "technology-enhanced engagement"OR "digital learning engagement"OR "online learning engagement"OR "behavioral engagement" OR "cognitive engagement"OR "emotional engagement" OR "academic engagement"OR "technology-mediated learning"OR "technology-enhanced learning"OR "digital learning" OR "online learning"OR "e-learning" OR "virtual learning")

AND ("reading comprehension" OR "reading skills"OR "reading proficiency" OR "reading achievement"OR "reading performance" OR "reading literacy"OR "digital reading" OR "online reading"OR "L2 reading comprehension"OR "second language reading"OR "English reading comprehension")AND(EFL OR ESL OR "English as a foreign language"OR "English as a second language"OR "English language learner*"OR "English language learning"OR "English language teaching"OR "second language English"OR "L2 English" OR "foreign language learning"OR "second language acquisition")AND("online learning environment"OR "online learning context"OR "digital learning environment"OR "virtual learning environment"OR "web-based learning"OR "computer-assisted language learning"OR CALL OR "technology-mediated language learning"OR "online language learning")

(AND PUBYEAR > 2019AND PUBYEAR < 2027 AND (LIMIT-TO(LANGUAGE, "English"))

Date Searched:

Search parameters	Description
Database	Scopus
Search platform	Scopus Advanced Search
Date searched	**25 August 2026**
Search fields	Title, Abstract and Keywords
Publication period	2020–2026
Language	English
Main concepts	Digital engagement, reading comprehension, EFL/ESL and online learning contexts
Boolean operators	AND, OR

Appendix B. Included study inventory

Study	Title	Indexed focus/keywords
Bahari (2021)	Establishing a computer-assisted interactive reading model	Bottom-up processing; Computer-assisted interactive reading model (CAIRM); Computer-assisted language learning (CALL); Top-down processing; Computer aided instruction; E-learning; Learning systems; Linguistics; Students;

Study	Title	Indexed focus/keywords
Kaban (2021)	Gamified E-Reading experiences and their impact on reading comprehension and attitude in EFL classes	Efl; Electronic reading; Gamification; Gamified e-reading; Reading attitude; Electronic document exchange; Electronic publishing; Gamification; Digital revolution; Educational settings; Electronic books; Electronic devic
Anggraini (2022)	The interaction effects of reading proficiency and personality types on EFL university students' online reading strategy use	English online texts; Online reading; Personality types; Reading proficiency; Reading strategies
Azmuddin (2022)	EXPLORATION OF ONLINE DISCUSSION FORUM ON READING EST TEXTS FOR ESL LEARNERS	English for science & technology; Learning management system; Online discussion forum; Online reading
Babashamasi (2022)	The Effect of Explicit Training of Metacognitive Reading Strategies on Online Reading Comprehension	metacognitive reading strategies; online teaching; reading comprehension
Rianto (2022)	EXPLORING CORRELATION BETWEEN METACOGNITIVE ONLINE READING STRATEGY USE AND ONLINE READING COMPREHENSION OF EFL STUDENTS	Academic majors; EFL students; metacognitive online reading strategies; online reading comprehension
Sumekto (2022)	The EFL students' online reading determinants: Perceiving from their selected folklore readings	EFL students' reading performance; online reading; reading determinants
Zaha (2022)	Analysis of the Interrelatedness of Self -Regulation, Learners‟ Engagement, and Self-Perceived Development in a Synchronous Online EFL Reading Course	engagement; online learning; reading comprehension; satisfaction; self - regulation
Cancino (2023)	Exploring Reading Attitudes, Reading Self-Efficacy, and Reading Proficiency in a Blended Learning Context Among EFL Learners	EFL learning; emergency remote teaching; L2 reading attitudes; L2 reading proficiency; L2 reading self-efficacy
Chen (2023)	Is a Video Worth a Thousand Words? Enhancing Second Language Reading Comprehension Through Video-Based E-book Design and Presentation; [一個影片勝過千言萬語? 探討動態影片電子書設計和呈現模式如何提升第二語為英語學習者的閱讀理解]	Digital input presentation mode; E-book design; Glosses; Reading cues; Second language reading; Video-based e-book
Chung (2023)	L2 Learners' Use of Raw Machine-Translated Output in Reading Comprehension	gisting; L2 reading comprehension; online machine translation; reading times; text order
Rattanasak (2023)	The interplay between the Internet-based reading resources and learner-to-learner interactions in blended language learning	blended learning; ELT instruction; hybrid learning; Internet-based resources; learner interaction; reading comprehension

Study	Title	Indexed focus/keywords
Shang (2023)	Exploring the Impact of Online Peer Discussions on EFL Reading Comprehension	Digital/online EFL/ESL reading study; see abstract.
Uçak (2023)	Scaffolding design to increase reading comprehension for learners of English through online strategy training	engagement in reading in english as a foreign language; metacognitive strategy awareness; Online reading strategy training; reading comprehension in english as a foreign language; scaffolding design
Yan (2023)	The effects of schema strategy training using digital mind mapping on reading comprehension: A case study of Chinese university students in EFL context	computer-assisted reading; digital mind mapping; Schema strategy
Abdelshaheed (2024)	Digital Collaborative Learning: Promoting Reading Comprehension and Vocabulary among Saudi University English Majors	collaborative learning; digital learning; English majors; promoting reading; reading comprehension; vocabulary learning
Alahmadi (2024)	Examining the Impact of a Digital Reading Progress Tool on Saudi L2 Learners' Reading Aloud Performance and Proficiency	digital reading; English as a second language; reading aloud performance; reading proficiency; Saudi learners
Limbong (2024)	Synchronous Online Reading toward Digital Literacy and Higher-Order Thinking Skills Supporting Cadets' Self-Regulated Learning	Digital literacy; HOST; Online Reading; Self-regulated learning; Synchronous
Maruf (2024)	Cognitive processes in EFL learners' reading comprehension: A comparative analysis of WhatsApp and traditional group-driven reading	Cognitive process; Individual learning; Reading comprehension; Small group; WA-driven learning
Xie (2024)	Impacts of reading anxiety on online reading comprehension of Chinese secondary school students: the mediator role of motivations for online reading	Education; Educational Psychology; Language Teaching & Learning; mediator role; Motivation; motivations for online reading; online reading comprehension; Reading anxiety; Richard Kruk, Psychology, University of Manitoba,
Yang (2024)	Distinctions between mobile-assisted and paper-based EFL reading comprehension performance: reading cognitive load as a mediator	cognitive load; digital reading; Mobile-assisted language learning; reading medium; structural equation modeling
Alhawsawi (2025)	ReadWorks in Action Research to Enhance Reading Skills for University EFL Students.	Action research; EFL; online platforms; reading comprehension; ReadWorks; technology-driven learning
Azmuddin (2025)	The Use of Digital Annotation Tools in Assisting Reading English for Science and Technology Academic Texts among L2 Learners in Higher Institutions	Digital Annotation Tools; English for Science and Technology; higher institution; Learning Management Systems; Online Reading
Du (2025)	The Correlation between First and Second Language Strategies and Reading Comprehension among	L1 Proficiency; L2 Proficiency; Reading Comprehension Performance; Reading Strategy Selection

Study	Title	Indexed focus/keywords
	Chinese International Students in an Online Reading Environment	
Habók (2025)	Comparative study of the use of online reading strategies in the L1 and L2	L1; L2; lower secondary school students; online reading strategies; reading comprehension
Kaowiwattanakul (2025)	Multimodal literature and CEFR reading proficiency: Improving literary reading skills in EFL learners	CEFR; EFL learners; multimodal literature; reading skills
Karaarslan (2025)	The effects of digital reading on third grade EFL students' motivation, attitude, reading comprehension, and vocabulary acquisition	attitude; Digital reading; motivation; reading comprehension; vocabulary acquisition
Khalaf (2025)	Enhancing students' reading comprehension skills through the use of epic: A comparative study	Engineering education; Teaching; Classroom settings; Comparatives studies; Foreign language; Learning outcome; Mixed method; Private schools; Reading comprehension; Student learning; Student perceptions; United Arab Emir
Mekheimer (2025)	Digital mind magnets as a scaffold for improving EFL online reading comprehension	Digital reading comprehension; EFL learners; Graphic organizers; Metacognitive strategies; Mind magnet; Online learning
Ounissi (2025)	The evolution of online extensive reading and web-based platforms in EFL/ESL: A narrative review of impacts, challenges, and future directions	challenges; EFL/ESL learners; extensive reading; future research directions; impacts; online extensive reading; web-based platforms
Ran (2025)	Enhancing specific critical thinking skills among EFL learners through computer-assisted interactive reading model in a CALL environment: An investigation of learner perceptions and performance	Analytical scaffolding; Computer-assisted language learning (CALL); Critical thinking skills; EFL learners; Interactive reading models
Rezai (2025)	A comparative study of the effects of informal digital learning of English in extracurricular and extramural settings on reading comprehension: a multi-analysis study on Iranian university students	EFL context of Iran; Extracurricular IDLE; extramural IDLE; reading comprehension
Wei (2025)	Promoting EFL learners' reading comprehension and critical thinking through online reading circles activities	attitudes toward online reading circles; critical thinking; EFL learners; Online reading circles; reading comprehension
de (2025)	Working memory capacity as a predictor of text idea recall in multitasking L2 digital reading	Bilingualism; Multitasking; Second language digital reading; Working memory capacity
Ahmad (2026)	From Reading Comprehension to Critical Literacy: Adapting Huh's Model in Online Indonesian EFL Classrooms	Critical literacy; Instructional model; Online classroom; Reading comprehension
Drobisz (2026)	The role of arousal in L2 readers' engagement and comprehension during	cognitive load; interest & motivation; online reading; pedagogical agents

Study	Title	Indexed focus/keywords
	pedagogical agent–guided online reading	
Khunaivi (2026)	The Effects of Mobile Virtual Literature Circles on EFL Reading Comprehension in Rural Indonesia	English as a Foreign Language (EFL) learners; Mobile Virtual Literature Circles (MVLCs); reading comprehension
Zhang (2026)	Effects of highlights and annotations on EFL learners' Reading comprehension: an application of computer-assisted interactive reading model	annotations; computer-assisted interactive reading model; Highlights; mixed methods; reading comprehension