

Integrating Digital Technology and Reading Strategy Instruction to Support ESL Learners' Reading Comprehension: A Conceptual Perspective

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ABSTRACT

Reading comprehension is a fundamental skill in English language learning and plays an important role in learners' academic achievement. However, many English as a Second Language (ESL) learners continue to experience difficulties in comprehending texts due to limited vocabulary, unfamiliar content, complex language structures, and inadequate use of reading strategies. At the same time, the increasing integration of digital technologies in education has created new opportunities to support language learning and reading development. This concept paper discusses the potential of technology-mediated reading strategies in enhancing ESL learners' reading comprehension. Drawing upon existing literature on reading comprehension, reading strategies, and digital language learning, the paper explores how technology can be integrated with strategies such as skimming, scanning, identifying main ideas, recognising supporting details, making inferences, and summarising. The discussion highlights the potential of digital tools to provide interactive learning experiences, scaffolding, immediate feedback, multimodal support, and opportunities for learner autonomy. However, the effectiveness of technology-mediated reading instruction depends on purposeful pedagogical integration rather than the use of technology itself. The paper proposes that combining explicit reading strategy instruction with appropriately selected digital tools can provide a more engaging and learner-centred approach to developing ESL learners' reading comprehension. The paper concludes by highlighting the need for pedagogically informed technology integration and further research into technology-mediated reading practices in ESL contexts.

Keywords: ESL learners, reading comprehension, reading strategies, technology-mediated learning, digital reading

INTRODUCTION

One of the essential language skills for learning of English Language is reading. It exposes learners to a wide range of information, knowledge, vocabulary, grammatical structures, and ideas from different sources. In educational settings, reading is particularly important because learners are frequently required to understand textbooks, academic articles, online materials, examination questions, and other forms of written communication. Therefore, the development of effective reading comprehension is essential for learners' academic achievement and their ability to function effectively in English-medium learning environments. Reading comprehension process is more than just recognizing individual words as it is a complex process. Readers need to construct meaning from written information, connect ideas within and across texts, activate relevant background knowledge, make inferences, and monitor their understanding. For learners of English as a second or additional language, these processes can be particularly demanding because they may need to manage linguistic difficulties while simultaneously constructing meaning from a text. ESL learners may encounter difficulties because of limited vocabulary, unfamiliar concepts, complex grammatical structures, insufficient background knowledge, or ineffective reading strategies. In particular, learners may struggle to identify the main

idea, distinguish supporting details, locate specific information, infer meanings that are not explicitly stated, and summarise information effectively. These difficulties highlight the importance of providing learners with explicit instruction in reading strategies rather than focusing solely on comprehension answers.

Reading strategies refer to deliberate actions that readers employ to facilitate comprehension. Common strategies include predicting, skimming, scanning, identifying main ideas, identifying supporting details, inferring meaning from context, questioning, summarising, and monitoring comprehension. Research on English language learners suggests that the use and effectiveness of reading strategies may vary according to learners' language proficiency, reading purposes, and learning contexts. Technology-assisted approaches have also been identified as providing additional support for reading comprehension and literacy development (Zuo & Ives, 2024). At the same time, the development of digital technologies has transformed the ways in which learners encounter and interact with written information. English learners increasingly engage with electronic books, online articles, social media content, and digital learning resources. Unlike printed texts, digital reading environments may provide hyperlinks, multimedia resources, integrated dictionaries, annotation functions, search features, and interactive activities. These affordances create opportunities for reading instruction to become more interactive and responsive to learners' needs. Previous research has highlighted both the potential and challenges of digital reading in second- and foreign-language contexts (Reiber-Kuijpers et al., 2021). More recent research has also reported encouraging evidence regarding the use of technology to support reading comprehension among English language learners (Murphy & Arciuli, 2024; Ni et al., 2022). However, the effectiveness of technology appears to depend on how it is designed and integrated into instruction rather than on the use of technology itself.

Despite the growing body of research on digital reading and technology-assisted reading instruction, less attention has been given to how specific reading strategies can be systematically aligned with the affordances of digital technologies. Existing research provides evidence of the potential of technology to support reading comprehension, but greater conceptual attention is needed to consider how digital tools can be purposefully integrated with explicit reading strategy instruction to address different aspects of comprehension. This consideration is particularly relevant for ESL learners, who may need support in applying appropriate reading strategies while navigating increasingly digital reading environments. Thus, the key issue is not whether technology should be used in reading instruction, but how technology can be meaningfully integrated with effective reading strategies and pedagogical practices. Technology alone does not automatically lead to better reading comprehension; rather, its effectiveness is likely to depend on how well digital tools are aligned with specific learning objectives, reading strategies, learner needs, and instructional practices. Therefore, this concept paper aims to discuss the potential of technology-mediated reading strategy instruction in supporting ESL learners' reading comprehension. It synthesises relevant literature on reading comprehension, reading strategies, digital reading, and technology-assisted instruction, and proposes a conceptual approach for aligning digital affordances with explicit reading strategy instruction. The paper further discusses how such alignment may support learners' strategic engagement with texts and considers the pedagogical opportunities and challenges associated with technology-mediated reading instruction.

LITERATURE REVIEW

Reading Comprehension among ESL Learners

Reading comprehension goes well beyond recognising individual words and sentences. In order to understand a text, readers have to construct meaning by integrating information presented in a text with their linguistic knowledge, prior knowledge, and understanding of textual structures. Comprehension also involves higher-level processes such as interpreting, evaluating, integrating, and synthesising information (Lee et al., 2022). Thus, successful reading requires readers to coordinate multiple cognitive and linguistic processes while maintaining an overall representation of the text. For learners of English as a second or additional language, these processes may be particularly demanding because reading in a second language involves the simultaneous processing of linguistic information and meaning. Vocabulary knowledge, grammatical knowledge, reading proficiency, and background knowledge can influence learners' ability to comprehend texts (Ibrahim, 2020). Limited vocabulary, for example, may restrict learners' access to key information, while unfamiliar concepts and insufficient background knowledge may make it difficult to establish connections between ideas. Similarly, difficulties with

complex sentence structures may increase the cognitive demands involved in constructing meaning from a text. Reading comprehension difficulties are also not explained solely by learners' linguistic proficiency. Strategic knowledge plays an important role in how learners' approach and process texts. Liu et al. (2020), in their comprehensive review of research on English as a second language readers, found that ESL learners employ a range of comprehension strategies and that strategy use can vary according to learners' proficiency, reading purposes, and task demands. Their review further indicated that more proficient learners tend to engage in higher-order comprehension strategies and that readers may select and coordinate strategies according to specific reading goals.

Overall, the literature suggests that ESL reading comprehension is influenced by both linguistic and strategic factors. While language knowledge provides an important foundation for understanding texts, learners also need to develop strategies that enable them to approach, process, and monitor information effectively.

Reading Strategies and Explicit Strategy Instruction

Reading strategies can be understood as purposeful actions that readers use to facilitate comprehension. These strategies may be applied before, during, and after reading and can include predicting, activating prior knowledge, skimming, scanning, identifying main ideas, recognising supporting details, inferring meaning from context, questioning, summarising, and monitoring comprehension (Habók et al., 2024). Rather than functioning as isolated skills, strategies can be coordinated according to the purpose of reading and the demands of a particular text. Before reading, learners may activate prior knowledge, examine titles and headings, preview the text, and make predictions about its content. During reading, they may skim to obtain an overall understanding, scan for specific information, identify important ideas, infer meanings, and monitor whether the text is being understood. After reading, learners may summarise information, evaluate ideas, answer questions, or reflect on their comprehension. Such strategic processes can help learners move beyond word-level processing towards more purposeful and active engagement with texts.

Research on English language learners provides support for the importance of strategy use. Song et al. (2020) found that EAL readers employ different comprehension strategies and may coordinate strategies according to reading goals and proficiency levels. The review also indicated that EAL readers use specialised strategies when engaging with online and hypertext materials, suggesting that strategic reading may become particularly important as learners encounter increasingly digital forms of text. However, awareness of reading strategies does not necessarily mean that learners can apply them effectively. Learners may require explicit instruction and guided practice to understand when, why, and how a particular strategy should be used. Explicit instruction can involve teacher modelling, explanation, guided practice, feedback, and gradual movement towards independent strategy use. Such instruction allows learners to observe the cognitive processes involved in comprehension rather than simply being asked to demonstrate a correct answer. Evidence from Adhikari et al. (2026) supports the value of instructional support for English learners' reading comprehension. Their meta-analysis of 23 studies involving 2,284 participants examined scaffolding, graphic organisers, interactive read-aloud, and levelled questions and found beneficial effects on reading comprehension. The authors also reported a potential additional benefit when multiple instructional strategies were combined throughout a lesson.

Taken together, these findings suggest that reading strategy instruction should move beyond teaching individual strategies in isolation. Learners may benefit from explicit guidance in selecting and coordinating appropriate strategies according to different reading purposes and comprehension demands.

Digital Reading in Second - Language Learning

The increasing integration of digital technologies into education has transformed the contexts in which learners encounter written information. Reading is no longer restricted to printed textbooks and articles; learners increasingly engage with electronic books, websites, online articles, digital learning platforms, social media content, and other multimodal resources. Digital texts can provide features such as hyperlinks, search functions, multimedia resources, online dictionaries, annotation tools, and interactive activities, creating reading environments that differ substantially from conventional printed texts.

Reiber-Kuijpers et al. (2021) conducted a systematic review of 31 studies examining digital reading in second- and foreign-language contexts. Their review identified several distinctive characteristics of digital reading, including different levels of text linearity, integrated tools, navigation features, information-management demands, and opportunities for interaction. The authors also highlighted gaps in the literature concerning strategy use in digital reading and called for greater attention to the affordances of digital environments and the perspectives of teachers and learners. The distinction between digital and print reading is important because digital reading may require learners to make additional decisions while processing information. Unlike a linear printed text, digital environments may require readers to decide whether to follow a hyperlink, use a search function, consult an online dictionary, access multimedia content, or move between different sections of a text. Consequently, digital reading may involve not only comprehension of textual information but also navigation, selection, and information-management processes. Research has therefore questioned whether reading from a digital medium can be assumed to produce the same cognitive and comprehension outcomes as reading from print. Recent evidence suggests that differences between digital and print reading are not necessarily straightforward and may depend on factors such as learner characteristics, text characteristics, and reading conditions. A recent meta-analysis of 37 experimental studies, for example, found no significant overall difference in reading comprehension between digital and paper-based reading, while identifying differences under particular moderating conditions. For second-language learners, the digital environment may create both opportunities and additional challenges. Digital features can provide immediate access to linguistic and contextual support, potentially helping learners overcome vocabulary and comprehension difficulties. At the same time, excessive navigation, multimedia elements, or unrelated information may increase attentional demands and interfere with comprehension. Reiber-Kuijpers et al. (2021) therefore emphasise the importance of understanding how learners use strategies within digital reading environments rather than assuming that access to digital features automatically improves comprehension.

Zuo and Ives (2024) similarly argue that technology-assisted reading instruction research has placed considerable emphasis on evaluating reading outcomes, while comparatively less attention has been given to learners' literacy practices and interactive engagement in digital contexts. Their methodological review also highlights the continuing emphasis on traditional literacy development rather than multimodal literacy, despite the expanded semiotic resources available through digital technologies. Overall, digital reading environments provide learners with additional resources and opportunities for interaction, but they also introduce new navigational and attentional demands. This suggests that ESL learners may require guidance in using digital affordances strategically rather than simply being provided with access to digital texts and tools.

Technology- Mediated Reading Instruction

Technology-mediated reading instruction refers to the purposeful integration of digital technologies into instructional activities designed to develop learners' reading comprehension and related literacy skills. Such technologies may include electronic texts, multimedia resources, digital annotation tools, online dictionaries, interactive quizzes, collaborative platforms, educational applications, and AI-supported tools. Their pedagogical value depends not simply on their availability but on how they are integrated into instructional activities and connected to specific learning objectives. Research has provided encouraging but varied evidence regarding the effectiveness of technology-mediated reading instruction. Jozwik and Douglas (2017), for example, demonstrated that technology-assisted activities combined with explicit reading strategy instruction could support English learners' strategy application and reading comprehension. Their intervention incorporated web-based tools, mind-mapping applications, web-linked texts, and collaborative activities alongside explicit instruction in reading strategies.

More recent research similarly suggests that technology can support reading development when appropriately integrated into instruction. Sulindra et al. (2024) reported that technology-assisted reading instruction can provide scaffolding, support collaboration and motivation, and contribute to reading development, although they also highlighted limitations in the existing evidence, particularly the limited attention given to learners' actual literacy practices in digital contexts. Silverman et al. (2025) likewise found positive reading-comprehension outcomes in a substantial proportion of the digital interventions they reviewed, although the effects varied across studies and methodological quality was inconsistent. The importance of pedagogical integration is further

supported by Dahl-Leonard et al. (2024), whose meta-analysis found a positive overall effect of educational technology on English reading achievement. Their findings indicated stronger effects for comprehensive technology-supported approaches than for technology used merely as supplementary activities, suggesting that digital tools are more effective when embedded within the broader curriculum and instructional process.

Taken together, these findings suggest that technology should be viewed as a means of supporting reading instruction rather than an intervention in itself. Digital tools can provide scaffolding, feedback, interaction, multimodal resources, and flexible access to information; however, these affordances do not automatically lead to improved comprehension. Their effectiveness depends on instructional objectives, learner needs, teacher guidance, and the reading strategies that learners are expected to develop. Importantly, the literature points to a need for greater conceptual attention to the relationship between digital affordances and specific reading strategies. While previous studies have examined technology-assisted reading, digital environments, and reading strategy instruction, these elements are not always systematically connected. This gap provides a basis for the present concept paper to consider how digital tools can be purposefully aligned with explicit reading strategies to support different aspects of ESL learners' reading comprehension.

DISCUSSION

Aligning Technology with Explicit Reading Strategies

The literature suggests that the pedagogical value of technology-mediated reading instruction lies not in the presence of digital tools but in the alignment between digital affordances, reading strategies, instructional actions, and intended comprehension outcomes. Evidence from digital reading research indicates that learners may encounter additional navigational and information-management demands in digital environments, while technology-assisted reading research also highlights the need for greater attention to how learners actually engage with digital texts and tools (Reiber-Kuijpers et al., 2021). Similarly, evidence from technology-based reading interventions suggests that more comprehensive integration with curriculum and pedagogy may be more beneficial than using technology merely as a supplementary activity (Ni et al., 2022).

Accordingly, the proposed framework adopts a pedagogy-first sequence. Teachers first identify the intended comprehension outcome, then select the reading strategy needed to achieve it, choose a digital affordance that can support the strategy, and determine the appropriate instructional move and learner activity. For example, a teacher targeting skimming may use an interactive digital text to enable rapid previewing of headings and opening sentences, whereas a teacher targeting scanning may use a search function after modelling how to identify appropriate keywords. Annotation tools may support the identification of main ideas and supporting details, while digital mind maps may support summarisation and synthesis. Online dictionaries can provide vocabulary support, but learners can first be required to infer meaning from context before checking a definition. Similarly, AI-supported prompts can encourage inference and reflection when learners are required to justify their responses using evidence from the original text.

The same technology may therefore support different strategies depending on how it is incorporated into the lesson. The search function, for example, can support scanning when learners search for information required by a reading question, but it can also become a source of superficial information retrieval if learners are not taught to interpret and evaluate the information they locate. The framework consequently treats digital tools as flexible instructional affordances rather than as strategy-specific interventions. Teacher modelling, guided practice, questioning, feedback, and gradual release of responsibility remain necessary to ensure that learners develop transferable strategic reading behaviours.

Proposed Integration across the Reading Process

Technology-mediated reading strategy instruction can be further conceptualised across the three broad stages of reading: pre-reading, while-reading, and post-reading. At each stage, digital tools can be used selectively to support particular cognitive and strategic processes. During the pre-reading stage, multimedia resources, images, videos, interactive polls, or word clouds can be used to activate background knowledge and encourage prediction. These activities can help learners establish a context for the text before reading. During the while-

reading stage, digital texts, annotation tools, search functions, online dictionaries, and interactive comprehension activities can support the application of reading strategies. Learners can skim for general meaning, scan for specific information, identify important ideas, infer meanings, and monitor their comprehension while interacting with the text. During the post-reading stage, digital mind maps, collaborative platforms, quizzes, and short-response activities can support learners in summarising, interpreting, and evaluating information. The use of multiple strategies across different stages is consistent with evidence suggesting that combining instructional strategies can provide additional benefits for English learners' reading comprehension (Yapp et al., 2021).

Based on this conceptualisation, Table 1 proposes possible relationships between digital affordances, reading strategies, pedagogical applications, and intended comprehension outcomes.

Table 1 Proposed Integration of Technology-Mediated Reading Strategies

Digital affordance	Reading strategy	Pedagogical application	Teacher instructional move	Example tools	Target comprehension outcome
Interactive digital texts	Skimming	Learners preview headings, subheadings, visuals, and opening sentences to identify the topic and general meaning	Model a short think-aloud showing how to preview a text before reading closely and ask learners to state the purpose of skimming	Google Docs, Microsoft OneNote, ReadWorks, digital e-books	Understanding overall meaning
Search functions	Scanning	Learners locate specific information such as names, dates, figures, or keywords	Demonstrate how to identify search terms from a question before using the search function, require learners to justify why a result answers the question	Browser search, PDF search, Google Docs search	Efficient retrieval of specific information
Digital annotation tools	Identifying main ideas and supporting details	Learners highlight, comment on, and categorise important information and supporting evidence	Model how to distinguish a central idea from supporting information, review selected annotations and provide feedback	Kami, Microsoft OneNote, Google Docs	Distinguishing important information
Online dictionaries and digital glosses	Inferring vocabulary from context	Learners infer word meanings from surrounding information before checking a digital definition	Require learners to record a contextual clue and tentative meaning before opening the dictionary	Cambridge Dictionary, Oxford Learner's Dictionaries, built-in e-book glosses	Understanding vocabulary in context
Multimedia resources	Activating background knowledge and predicting	Learners use images, short videos, or audio to activate prior knowledge and predict content	Ask prediction questions before revealing the text, connect learners' predictions to headings or key vocabulary	YouTube, Padlet, Mentimeter.	Activating relevant knowledge and establishing expectations
Interactive comprehension activities	Comprehension monitoring	Learners answer questions during reading and use feedback to identify	Pause at strategic points and ask learners to explain how they know an answer, prompt	Google Forms, Quizizz, Kahoot!, Microsoft Forms	Identifying and resolving comprehension difficulties

		areas of misunderstanding	learners to reread when evidence is insufficient		
Digital mind-mapping tools	Summarising	Learners organise major ideas and supporting details into a visual representation	Model how to reduce a paragraph to key ideas and connect related information; ask learners to compare and revise maps	MindMeister, Canva, Miro, Coggle	Synthesising and organising information
Collaborative platforms	Interpretation and evaluation	Learners discuss interpretations and support responses with textual evidence	Assign evidence-based discussion prompts and require learners to quote or identify relevant sections of the text	Padlet, Google Docs, Microsoft Teams	Developing deeper textual understanding
AI-supported prompts	Inference and reflection	Learners respond to prompts requiring explanation, justification, comparison, or inference	Provide structured prompts and require learners to cite textual evidence before consulting or responding to AI-generated feedback; model critical evaluation of AI responses	ChatGPT, Microsoft Copilot, Gemini	Developing inferential and reflective comprehension

Table 1 illustrates that technology is not treated as an instructional objective in itself. Instead, each digital affordance is connected to a specific reading strategy, an observable classroom activity, a teacher instructional move, and an intended comprehension outcome. The inclusion of teacher instructional moves is particularly important because the same digital tool may support different learning outcomes depending on how it is introduced, modelled, and monitored. This flexibility is important because digital reading environments contain multiple affordances that can be used in different ways according to learners' needs and the demands of the reading task (Astri et al., 2024). Thus, the framework emphasises pedagogical alignment rather than tool selection alone.

Classroom Vignette: Applying the Proposed Framework

To illustrate how the proposed framework can be implemented in practice, consider a 60-minute reading lesson for intermediate ESL learners in Malaysian higher education. The lesson uses a digital article on online privacy and personal data. Before reading, the lecturer displays the title and selected visuals from the article and uses Mentimeter to elicit learners' predictions about the topic. Rather than simply collecting responses, the lecturer models how to make a prediction by identifying clues from the title and visuals and relating them to prior knowledge. This activity targets prediction and background-knowledge activation while using technology to increase learner participation.

During reading, the lecturer explicitly models skimming by demonstrating how to preview the title, headings, subheadings, and opening sentences to identify the general meaning of the text. Learners then practise the strategy by selecting the most appropriate summary of the article. For scanning, learners are given specific questions requiring information such as names, dates, or key facts. Before using the search function, the lecturer demonstrates how to identify keywords from each question. Learners then search the digital text and highlight the relevant sentences as evidence for their answers. For unfamiliar vocabulary, learners are first required to infer meaning from contextual clues and record a tentative definition before checking an online dictionary. The lecturer uses questioning to prompt learners to explain which contextual clues informed their inference.

After reading, learners create a digital mind map showing the main idea and supporting details of the article. The lecturer models how to reduce longer sections into key points and provides feedback as learners revise their

maps. Learners then discuss an inferential question and are required to justify their interpretation using evidence from the text. An AI-supported prompt may be introduced at this stage to encourage further reflection. However, learners must compare any AI-generated response with the original text and determine whether the interpretation is supported by textual evidence. This reinforces the use of AI as a reflective support rather than a substitute for comprehension.

This vignette demonstrates the proposed alignment among the comprehension outcome, reading strategy, digital affordance, teacher instructional move, and learner activity. Technology is introduced only after the instructional purpose and reading strategy have been identified. The lecturer remains responsible for modelling, guiding, questioning, and providing feedback, while digital tools provide opportunities for interactive practice, annotation, information retrieval, visual organisation, and reflection. The example therefore illustrates how technology can be integrated into reading instruction without replacing explicit strategy teaching.

Pedagogical Considerations and Implications

Although technology offers opportunities to support reading comprehension, its implementation requires careful pedagogical consideration. Digital environments may expose learners to distractions, excessive information, and additional attentional demands, while differences in digital literacy and access to reliable technology may also affect learners' participation (Martin et al., 2025). Teacher guidance is therefore essential to model reading strategies, provide scaffolding, monitor comprehension, and gradually encourage independent strategy use. This is consistent with evidence supporting explicit instructional strategies and scaffolding in English learners' reading comprehension. Technology may also support learner engagement and autonomy by providing flexible access to texts, digital resources, and feedback. However, technology use alone does not guarantee improved comprehension, as outcomes vary across technology-mediated reading interventions (Putra et al., 2026). AI-supported tools may similarly be used to provide prompts, explanations, and feedback, but should function primarily as scaffolding rather than replace learners' own interpretation and evaluation of texts.

Overall, effective technology-mediated reading instruction requires a pedagogy-first approach, in which the intended comprehension outcome and reading strategy are established before selecting appropriate digital tools. Through such alignment, technology can complement explicit reading strategy instruction and provide more interactive, supported, and purposeful opportunities for ESL learners to engage with texts.

Limitations

This paper is conceptual and does not provide empirical evidence of the effectiveness of the proposed framework. The framework is informed by findings from previous research conducted across different educational levels, learner populations, and digital contexts. Therefore, its applicability to Malaysian higher education ESL settings requires further investigation. Differences in learners' proficiency, digital literacy, access to technology, and teachers' technological pedagogical knowledge may also influence implementation and outcomes.

In addition, the framework focuses primarily on reading comprehension strategies and does not address all aspects of digital literacy, such as multimodal literacy, online information evaluation, accessibility, and digital citizenship. The inclusion of AI-supported tools also requires careful consideration because their educational benefits and potential risks are still developing. These limitations highlight the need for empirical research to examine the framework across different learner groups and instructional contexts.

Proposed Future Empirical Study

Future research could empirically examine the proposed framework among ESL learners in Malaysian higher education. A quasi-experimental mixed-methods design could be used, involving comparable ESL classes assigned to an alignment-based technology-mediated reading strategy group and a comparison group receiving conventional reading instruction. The intervention could be implemented over eight to ten weeks and focus on strategies such as skimming, scanning, identifying main ideas, inference, and summarising.

Pre- and post-tests could be used to measure changes in reading comprehension and strategic reading ability. Classroom observations, learner questionnaires, and semi-structured interviews could provide additional

information about how teachers implement the framework and how learners use digital tools during reading. Quantitative data could be analysed to compare changes between groups, while qualitative data could be analysed thematically to identify patterns in learner strategy use and teacher implementation.

Such a study would provide empirical evidence on whether systematic alignment between digital affordances, reading strategies, teacher instructional moves, and comprehension outcomes can enhance ESL learners' reading development. It could also help determine whether the effectiveness of the framework varies according to learners' proficiency levels and digital reading experiences.

CONCLUSION

Reading comprehension requires learners to integrate linguistic knowledge, background knowledge, cognitive processes, and strategic reading behaviours. In digital environments, learners also need to navigate additional resources and features that can either support or distract from comprehension. This paper therefore proposes a technology-mediated reading strategy framework that aligns digital affordances with reading strategies, teacher instructional moves, learner activities, and intended comprehension outcomes. The framework, illustrated through Table 1 and the classroom vignette, emphasises that technology should support explicit strategy instruction rather than replace it.

The framework has implications for both teacher training and materials design. Teacher training should move beyond technical knowledge of digital tools towards pedagogical decision-making, including selecting appropriate tools for specific reading objectives, modelling strategy use, monitoring learner engagement, and guiding learners to evaluate digital and AI-generated information critically. Similarly, digital reading materials should incorporate clear learning objectives, guided strategy practice, opportunities for annotation and reflection, and tasks that require learners to provide textual evidence. Materials should avoid unnecessary technological features and should not simply convert conventional worksheets into digital formats.

As a conceptual framework, this paper does not establish causal evidence of its effectiveness. Future empirical research using quasi-experimental and mixed-methods designs could examine whether systematic alignment between technology, reading strategies, teacher guidance, and learner activities improves ESL learners' reading comprehension and strategic reading ability. Ultimately, the effectiveness of technology-mediated reading instruction depends not on the number of digital tools used, but on the quality of the pedagogical decisions that connect technology to meaningful reading processes and outcomes.

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