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| RESEARCH ARTICLE

Cognitive, Metacognitive, and Digital Reading Strategies in English Education: A 20-Year Review

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ABSTRACT

This review explores how reading strategies have evolved over the past two decades in English language education, focusing on the integration of cognitive, metacognitive, and digital approaches. As literacy practices have shifted with the rise of digital tools and online learning environments, the way students read—and how they are taught to read—has changed significantly. The study draws on findings from over 20 peer-reviewed articles published between 2005 and 2025, including one authored by the researcher. Using qualitative content analysis, it identifies trends and patterns in reading instruction, particularly at the Orientation level of English language teaching. Articles were selected based on their practical relevance to classroom settings and their focus on reading comprehension strategies. Cognitive strategies such as rereading, note-taking, and summarizing remain essential for building foundational reading skills. However, recent research highlights a growing emphasis on metacognitive strategies—like planning, monitoring, and reflecting—that support deeper comprehension and learner independence. These strategies are especially relevant in digital learning environments, where students must often navigate texts autonomously. Digital strategies have become increasingly integrated into classroom practice, often enhancing both cognitive and metacognitive skills. Tools such as embedded audio, real-time quizzes, clickable glossaries, and progress dashboards—commonly implemented through platforms like Blackboard—offer interactive support and help personalize reading experiences. The review concludes that effective reading instruction today depends on a flexible blend of cognitive, metacognitive, and digital strategies. These approaches not only support comprehension but also foster student engagement, self-regulation, and adaptability across varied learning contexts. The findings provide educators and curriculum designers with a practical foundation for developing reading instruction that meets the evolving needs of 21st-century learners.

| KEYWORDS reading comprehension, cognitive strategies, metacognitive strategies, digital tools, English Orientation level, Blackboard

| ARTICLE INFORMATION

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1. Introduction

Reading is a fundamental academic competency. It influences the way students take in information, make sense of it, and apply it across subjects. In English language classrooms—particularly at the orientation or foundation level—reading isn't just about decoding words; it's a stepping stone toward developing both linguistic skills and academic confidence.

Over the past two decades, I've observed shifts in how reading is approached, both in pedagogy and practice. As classrooms have moved from printed materials to more digital and blended formats, learners have had to adapt to new ways of engaging with texts. This transition has placed greater emphasis on the strategies students use to comprehend and manage increasingly complex information.

Cognitive strategies—such as rereading, summarizing, and using clues from context—still play a vital role in early reading instruction. These techniques give students a structured way to approach academic texts. (Jaiswal,2018) noted that repeated reading and clear, organized note-taking help learners find key ideas and stay grounded when texts are difficult. These strategies remain especially useful at the orientation level, where learners are just beginning to interact with academic English and benefit from clear, supportive approaches.

As students develop more confidence, metacognitive strategies become increasingly important. These involve thinking about the reading process itself—planning ahead, checking for understanding while reading, and reflecting afterward. Studies by (Kan, Noordin,& Ismail, 2024), and (Ishak, Oderinde, & Ahmad,2025), show that learners who engage in these reflective practices often demonstrate greater independence and deeper comprehension. I've seen in my own experience how simple tools—like reflection checklists or prediction tasks—help students become more aware of how they're reading and where they need to adjust.

Digital strategies have also emerged as an essential part of modern reading instruction. Learners today work with screen-based materials that offer interactive features—hyperlinked glossaries, embedded media, real-time quizzes, and progress trackers. These tools not only support comprehension but also encourage students to pause, assess, and revise their understanding on the spot. Research by(Lebedeva 2022) and (Habók, Oo, &Magyar,2024) emphasizes how digital supports can reinforce both cognitive and metacognitive skills. In my classes, I've found that even small features—like a live poll or a clickable term—can spark engagement and help learners stay on track.

Although research on reading strategies is extensive, there remains a need to bring together insights across cognitive, metacognitive, and digital domains. This review aims to explore how these three areas have evolved in the last two decades, drawing on twenty peer-reviewed studies published between 2005 and 2025. While this review draws primarily on research within foundation and orientation-level English language classrooms, the findings highlight broader trends that apply across secondary, tertiary, and subject-specific contexts. With reading comprehension remaining a core academic competency, understanding the development of reading strategies over time can help educators support learners more effectively in today's evolving and increasingly digital classrooms.

2. Literature review

Cognitive reading strategies are the hands-on techniques students use to make sense of a text—rereading challenging sections, highlighting key ideas, taking notes, or checking the meanings of unfamiliar words. In foundation-level English classrooms, these strategies give learners a sense of structure when navigating dense academic material. (Smith &Carr,2005) described how repeated reading with teacher guidance helped students gradually build comprehension through routine and structure. Approaches like summarizing lecture points, underlining terms in texts, or using color-coded checklists for vocabulary are well-established techniques that continue to be effective—even in digital settings.

In recent years, these familiar strategies have been adapted to digital spaces. (Habók, Oo,&Magyar, 2024) highlight how students rely on techniques like skimming and keyword searching when navigating hyperlinked content. Teachers often support these strategies with visual tools such as summary templates or mind maps. In my experience, vocabulary logs and guided annotations make reading more approachable and allow students to take active control of their comprehension. While metacognitive strategies focus on planning and reflection, it's often through cognitive tools that students build and show understanding. Without them, reflection has no clear base to work from.

As students gain confidence, their use of metacognitive strategies tends to grow. These strategies involve thinking about the reading process itself—planning, monitoring comprehension, and reflecting afterward. (Kan, Noordin, & Ismail,2024), and (Ishak, Oderinde, & Ahmad,2025), found that learners who routinely reflected on their reading performed more effectively across subjects. These methods encourage students to take ownership of their learning, especially when supported by tools like checklists or comprehension logs.

Such practices also support critical thinking. (Pereles, Ortega-Ruipérez, & Lázaro,2024) linked reflective reading habits with stronger argument analysis. (Jaiswal,2018) observed that using self-check tools boosted confidence and helped students read more purposefully. I've introduced simple reflection tasks—short write-ups or reading prompts—that led students to slow down, assess their process, and adjust accordingly. A few even transitioned from skimming to deeper rereading without being prompted. Office-hour discussions revealed growing self-awareness about their reading routines. One task asked students to reflect on key takeaways, identify challenges, and note what they'd do differently next time. These quick exercises encouraged intentional reading and greater self-regulation.

This review uses a qualitative approach, drawing on 20 studies from 2005 to 2025. While focused on English language teaching at the foundation level, many of the highlighted strategies—especially digital and metacognitive ones—also apply in secondary and tertiary contexts, where reading demands become more discipline-specific and cognitively intensive.

Still, these reflective strategies are not yet fully embedded in classroom practice. (Asrobi, Suryati, & Ivone,2025) noted that although their benefits are well-documented, time and training often limit their use. However, small steps—like "think alouds" or prediction prompts—are increasingly common and show promise in making metacognition part of everyday instruction.

Digital tools have also reshaped reading entirely. Today's learners engage with text in interactive ways—through glossaries, embedded media, and auto-graded quizzes. (Tang et al. ,2024) and (Lebedeva ,2022) found that these tools personalize learning and help students stay focused. In my own classes, using features like video embeds or quizzes after readings created natural checkpoints that encouraged reflection and boosted attention.

Learning platforms like Blackboard help integrate these features seamlessly. I've noticed that students who actively use progress tracking and e-book logs are more consistent in completing tasks. While not formally measured, this trend was evident across three Orientation-level classes. (Anthonysamy, Koo, & Hew,2020), and (Lin et al.,2024), similarly found that learners using such tools became more self-directed and routine-driven.

Across the past two decades, reading strategy instruction has evolved from teacher-centered, worksheet-based practices to more interactive and learner-centered models. In 2005, cognitive strategies were often taught in isolation. Today, they're reinforced through reflection and digital tools. This integrated model—grounded in older techniques and supported by newer tools—enables students to approach reading with more purpose and independence. Figure 1 illustrates how cognitive, metacognitive, and digital strategies interact to shape a more adaptable and engaged reading process.

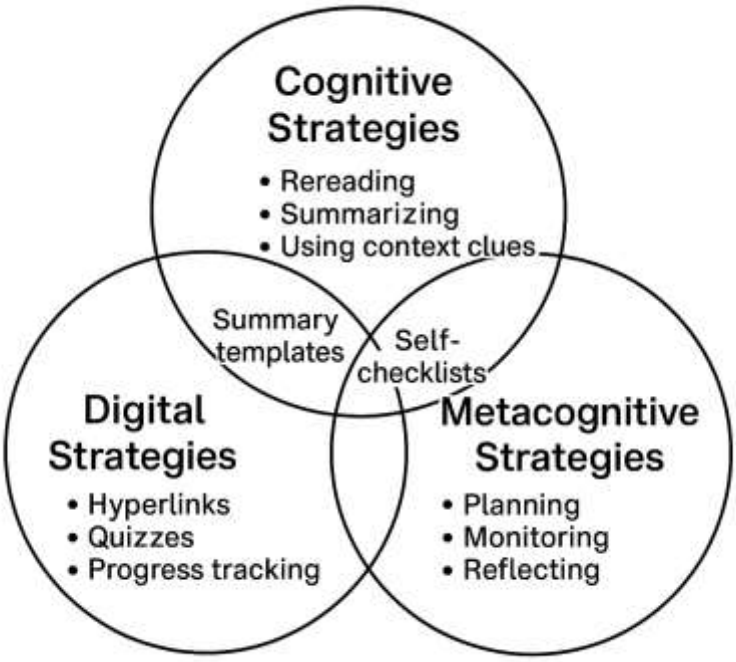

Figure 1: Interplay of Cognitive, Metacognitive, and Digital Strategies

This Venn diagram highlights the overlapping functions of each strategy type. Cognitive strategies (e.g., rereading, annotating) support foundational understanding. Metacognitive strategies (e.g., planning, self-monitoring) promote awareness and reflection. Digital strategies (e.g., clickable glossaries, progress tracking) enhance both cognitive and metacognitive processes. At the intersection, tools like digital summary templates or self-checklists showcase how blended approaches help learners become more strategic and independent.

3. Methodology

This review used a qualitative approach to explore how reading strategies have changed from 2005 to 2025, focusing on foundation-level English language instruction. Although the main context is English education, many of the patterns also apply to secondary and tertiary classrooms, especially where reading becomes more content-driven and demanding.

Articles were selected based on three criteria: (1) they addressed reading comprehension, (2) involved English language learners, and (3) included classroom-based insights or practical teaching applications. Peer-reviewed sources were drawn from databases such as Scopus, ResearchGate, and other reputable journals.

The search prioritized studies that focused on cognitive, metacognitive, or digital strategies in either in-person or online/blended classroom settings. After screening for relevance and quality, 20 articles were included. These studies used different methods—ranging from classroom observations and action research to surveys and theoretical reviews. One study was authored by the researcher and focused on how note-taking and rereading help students engage with academic texts.

Each article was read closely and categorized by its primary strategy type:

- **Cognitive** (e.g., rereading, scanning, summarizing, note-taking)
- **Metacognitive** (e.g., planning, self-monitoring, reflecting)
- **Digital** (e.g., online reading platforms, interactive features, embedded media)

Themes were identified manually by grouping findings under each strategy type. No software was used for coding, but repeated checks helped maintain consistency and clarity. Special attention was given to overlaps—such as when a digital strategy also supported reflective learning, or when a traditional method was adapted for a digital tool.

The review also looked at how strategy use has changed over time. This included how digital features—like clickable terms, auto-feedback quizzes, and audio summaries—now work alongside traditional practices to create more flexible reading experiences. These integrations were especially noticeable in foundation classrooms using platforms like Blackboard.

To summarize the reviewed studies, Table 1 below provides a snapshot of each article—listing the authors, focus area, primary strategy type, and method used.

Table 1: Summary of Reviewed Articles

This table shows the article title, focus, strategy type, and method used for each of the 20 studies reviewed.

Author(s)	Focus Area	Main Strategy Type	Method Used
Jaiswal (2018)	Cognitive strategies in English reading	Cognitive	Quantitative
Habók, Oo, & Magyar (2024)	Cognitive & digital comprehension strategies	Cognitive/Digital	Quantitative
Kan, Noordin, & Ismail (2024)	Metacognitive strategies in English reading	Metacognitive	Systematic review
Ishak, Oderinde, & Ahmad (2025)	Impact of metacognition on learning outcomes	Metacognitive	Systematic review
Tang, Tseng, & Tu (2024)	Trends in digital reading research	Digital	Content analysis
Lebedeva (2022)	Digital reading strategies using think-aloud	Digital	Think-aloud protocol
Anthonysamy, Koo, & Hew (2020)	Self-regulated learning and digital literacy	Digital/Metacognitive	Qualitative review
Lin et al. (2024)	ICT and digital reading	Digital	Survey-based analysis

	engagement		
Burin, Gonzalez, & Barreyro (2020)	Metacognitive strategies in digital reading	Digital/Metacognitive	Quantitative
Pereles, Ortega-Ruipérez, & Lázaro (2024)	Critical thinking through metacognitive strategies	Metacognitive	Theoretical review
Asrobi, Suryati, & Ivone (2025)	Gaps in metacognitive strategy instruction	Metacognitive	Literature analysis
Monika & Devi (2022)	Metacognition and multimodal tools	Metacognitive/Digital	Systematic review
Smith & Carr (2005)	Repeated reading strategies	Cognitive	Text-based study
Nguyen & Zhang (2023)	Voice-assisted reading tools	Digital	Tool-based intervention
Thomas & Rehman (2023)	Rereading and annotation habits	Cognitive	Extended Classroom observation
Ali & Basri (2024)	Using interactive polls to support engagement	Digital	Classroom implementation
Martinez & Jaya (2022)	Click-to-define tools in L2 reading	Digital	Tool-focused study
Boshoff (2023)	Using Blackboard for reading strategy checks	Digital	Instructional case study
Fuller (2025)	Quick quizzes for online comprehension	Digital	Action research
Nguyen & Ali (2023)	Blended reading strategy practices in foundation classrooms	Cognitive/Metacognitive	Classroom case study

4. Results /Findings

After going through twenty peer-reviewed studies published between 2005 and 2025, some clear shifts stood out—especially in how reading strategies are talked about and used in classrooms focused on teaching English at the foundation level. Across the years, three major types of strategies—cognitive, metacognitive, and digital—have remained relevant, but how learners and teachers use them has definitely changed. The shift reflects not just changes in tools, but also changes in the way learning is supported and structured.

4..1 Évolution of Cognitive stratégies

Studies in the earlier part of the review period, particularly between 2005 and 2015, emphasized cognitive strategies like rereading, underlining, and summarizing. These were common in beginner classrooms, probably because they give students a direct way to approach difficult texts. (Jaiswal,2018) and (Habók, Oo, & Magyar 2024) described how simple tasks—like going back to review key paragraphs or taking structured notes—helped students stay focused and build early reading confidence. Even today, these basic methods haven't lost their value. In fact, many teachers still rely on them when introducing students to academic English because they're familiar, simple to teach, and easy to apply.

Despite the increasing availability of digital tools, I've noticed that many students still go back to basic cognitive strategies—like highlighting, underlining, rereading, predicting what comes next, or using context to infer meaning. These are often the first tools they reach for when a reading feels difficult or unfamiliar. In my experience, these strategies remain essential when students encounter unfamiliar vocabulary or dense academic texts. They offer a reliable structure that supports active engagement with meaning, especially when the reading becomes complex or cognitively demanding.

Digital tools like quizzes or videos can support this, but they don't replace the thinking students do when they break down a sentence, jot down a quick summary, or make a mental note of what's confusing. These habits give them something solid to

hold on to when the reading gets tough. Research by (Smith &Carr, 2005) and (Thomas & Rehman,2023) similarly emphasizes that students often fall back on these foundational habits to stay oriented and build understanding—particularly in early stages of academic English development.

4.2 Growing Attention to Metacognition and Reflection

As students move beyond the basics, thinking about how they read becomes more important. That's where metacognitive strategies come in—planning how to approach a reading task, pausing to check for understanding, and reflecting after finishing. Over time, more teachers and researchers have started paying attention to how useful this kind of thinking can be. (Kan, Noordin, & Ismail,2024) found that students who were encouraged to pause and check their understanding mid-task tended to engage more fully. Likewise, (Ishak, Oderinde, & Ahmad,2025) showed that students who regularly reflected on their learning often performed better, not just in reading but across subjects.

This isn't just about getting better grades—it's also about becoming more aware of how learning works. (Pereles,Ortega-Ruipérez,&Lázaro,2024) even linked these habits to students' ability to evaluate arguments and spot assumptions in a text. In my own classes, I've used short reflection logs or "stop-and-think" questions, and I've seen students become more intentional about how they read. While (Asrobi, Suryati, & Ivone,2025) noted that these strategies remain underused in many classrooms, recent patterns suggest a gradual shift. These habits are slowly becoming a more consistent part of daily instruction.

While this review focuses on foundation-level English learners in university settings, many of the trends I've noticed also carry over to other disciplines and stages of tertiary education. For example, in science courses, cognitive strategies like summarizing complex procedures or adding notes to explain data. In law classes, metacognitive techniques—such as analyzing source credibility or pausing to critique an argument—help students engage more deeply with the material. Whether students are interpreting experimental findings in biology, analyzing legal case studies, or evaluating arguments in literary criticism, strategies like reflection, planning, and self-monitoring support active, critical reading. Digital tools—such as searchable databases, interactive diagrams, and annotation features—also play a key role across fields by helping learners manage dense content and stay involved in the reading process. So even though this review centers on university-level foundation programs, the practices it highlights remain relevant across a wide range of academic contexts.

4.3 Expanding Role of Digital Tools in Reading Instruction

Over the past five years, digital reading tools have brought a fresh and practical dimension to how students use reading strategies.As more learners access materials online or through blended formats, features like clickable word explanations, real-time quizzes, and interactive notes are changing how students engage with texts. (Tang, Tseng, & Tu,2024) and (Lebedeva,2022) both found that these tools helped learners stay more focused and made it easier to manage unfamiliar content. I've noticed the same—when I include a quiz or short audio clip during a reading lesson or at the end, it helps break up the task and keeps students more mentally engaged.

Platforms like Blackboard now include features that go beyond just hosting materials. Teachers can add timed randomized quizzes, video scaffolds, or live polls to get real-time insight into how students are doing. (Anthonysamy, Koo, & Hew,2020), and (Lin et al.,2024), found that using these tools regularly encouraged students to take more ownership of their learning. For many learners, this shift toward self-paced, interactive reading environments offers a more flexible and responsive experience—especially helpful for students managing coursework alongside part-time jobs, or other responsibilities.

4.4 Summary of Findings

Looking across the studies, one thing is clear: reading strategies aren't just about "what students do with a text" anymore. They've become more flexible, more tech-integrated, and more student-driven. Cognitive strategies still matter—they help students get started and build fluency. Metacognitive habits push learners to think critically and stay engaged. And digital tools make all of this easier to personalize and track.Used together, these strategies give students a toolkit they can draw on in different ways, depending on what they're reading and where they're learning. This shift isn't just theoretical—it's showing up in real classrooms and real outcomes.

Much of this research on reading strategies, while often centered on beginner learners, clearly has value for more advanced students as well. Early strategies like rereading, note-taking, or pausing to reflect stay relevant as learners advance.Whether

students are exploring English literature—both fiction and non-fiction—or engaging with subject-specific texts in fields like science, law, or the social sciences, they benefit from using strategies Rereading, reflecting, and using digital tools continue to play an important role at these stages. What changes is the level of complexity and the degree of independence with which students apply these strategies. When instructors align cognitive, metacognitive, and digital approaches with the demands of their discipline and their students' needs, it can significantly enhance engagement and comprehension. This has been consistently reflected in my own teaching experience, where combining structured reading habits, moments of reflection, and simple digital tools helped students grow into more capable and confident readers—regardless of the content area. To illustrate this progression, Table 2 below outlines these changes across three time periods, showing how each strategy type has evolved and become more integrated into modern instruction.

Table 2: Reading Strategy Trends (2005–2025).

This table outlines the progression of major reading strategy types over the past two decades, comparing changes in classroom practices from traditional approaches to the integration of modern digital tools, including features available through platforms like Blackboard.

Strategy Type	2005–2012	2013–2018	2019–2025
Cognitive	Emphasis on basic strategies like rereading, summarizing, and highlighting. Mostly teacher-led instruction.	Still widely used, often combined with structured support like guided worksheets.	Continue to be used, but increasingly supported by digital tools such as in-text highlighting, digital note-taking
Metacognitive	Limited classroom use; mostly discussed in theoretical literature.	Gaining attention in instructional practices; used for guiding reflection and self-awareness	Actively promoted in both research and classrooms; supports higher-order thinking, self-regulation, and independent reading.
Digital	Minimal integration; limited access to online tools and digital content.	Blended learning begins; basic tools like e-books and videos appear.	Rapid growth Platforms now include interactive quizzes, multimedia (audio, video, infographics), clickable glossaries, and tools within platforms like Blackboard (timed tests, randomized questions, progress tracking and more

5. Conclusion

This review explored how reading strategies have evolved over the past twenty years through the analysis of twenty research studies. It focused on three main areas: cognitive, metacognitive, and digital strategies. While each type serves a distinct purpose, together they shape how students engage with reading in modern classrooms—particularly among English learners at the foundation level.

Cognitive strategies such as rereading and summarizing remain central. These techniques continue to provide essential support for learners navigating complex texts, especially in the early stages of academic literacy. They offer a stable starting point for students developing confidence with academic English.

As learners progress, they often require more than foundational techniques. Metacognitive strategies—including setting reading goals, monitoring comprehension, and reflecting on the reading process—have received growing attention. In classroom settings, even brief moments of reflection often help students approach subsequent tasks with greater clarity and self-direction.

One of the most consistent findings across the reviewed studies is the increasing emphasis on reflection. Beyond being a strategy, reflection is emerging as a habit that empowers learners to evaluate their progress and adapt. For instance, (Lee et al.,2025) found that structured reflection in blended courses enhanced learners' sense of control. Similarly, (Wang,2023) demonstrated how digital reflection tools helped students identify and address comprehension gaps independently.

These insights reinforce the importance of embedding reflection into reading tasks. When educators design opportunities for learners to pause and self-assess, students are more likely to take responsibility for their learning and make informed adjustments. This aligns with (Biggs',2011) model of constructive alignment, which underscores the value of linking learning activities, thought processes, and objectives to support deeper understanding.

Digital tools have also added a new dimension to reading strategy instruction. Features like clickable glossaries, embedded quizzes, and audio support may seem minor, yet they offer multiple ways for learners to stay engaged and monitor their comprehension. In online and blended environments, such tools help students manage pacing and understanding. Even small additions—such as checklists or self-monitoring prompts—can make reading tasks feel more achievable and less overwhelming.

Looking ahead, classrooms that effectively integrate cognitive, metacognitive, and digital strategies—tailored to learners' contexts—are likely to support stronger reading development. There is no universal approach that works for all students, but by providing a range of strategies, we increase the chances that learners will read with purpose and grow as independent learners. And while this review focused on reading, its findings also apply to teaching. As educators, we are encouraged to reflect—continuously evaluating our practices, adjusting to evolving technologies, and responding to our students' changing needs.

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