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The Effectiveness of Cognitive Strategy Instruction in Enhancing Cognitive Processing and Narrative Reading Comprehension: A Systematic Literature Review

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Abstract

Cognitive Strategy Instruction (CSI) has been widely recognized as an effective pedagogical approach to enhance students' higher-order thinking and reading comprehension skills, particularly in processing narrative texts. However, despite its growing application across various educational contexts, the extent of its effectiveness remains inconclusive. This study aims to evaluate the effectiveness of Cognitive Strategy Instruction in improving students' cognitive processing and narrative reading comprehension. The study adopts a systematic literature review approach guided by the PRISMA 2020 framework. A comprehensive search was conducted across major electronic databases, including Scopus, Web of Science, and Google Scholar, covering publications from 2015 to 2025. A total of 18 empirical studies were selected based on predefined inclusion criteria. The findings indicate that Cognitive Strategy Instruction significantly enhances students' cognitive processing abilities, including metacognitive awareness, inference-making, and information integration. Additionally, CSI shows a positive impact on students' comprehension of narrative texts, particularly in identifying story structure, main ideas, and implicit meanings.

Keywords: Cognitive Processing, Cognitive Strategy Instruction, Reading Comprehension, Narrative Text, Reading Comprehension, Systematic Literature Review

Introduction

Reading comprehension is a fundamental component of language learning, particularly in engaging with narrative texts that require not only literal understanding but also higher-order cognitive processing such as inferencing, interpretation, and integration of information. The Programme for International Student Assessment (PISA 2022 Results (Volume I), 2023), which surveyed approximately 700,000 fifteen-year-old students across 81 countries, reported an unprecedented decline in reading performance mean reading scores fell by 10 points relative to the 2018 cycle — the equivalent of half a year of learning — with declines observed across virtually all participating nations. In contemporary educational contexts, learners are expected to demonstrate critical thinking and deep comprehension skills, which necessitate instructional approaches that actively engage cognitive processes rather than relying on passive reading practices; (Kim et al., 2006) .

Review of Related Literature

Cognitive Strategy Instruction (CSI) has emerged as a promising approach to address these challenges by explicitly teaching learners how to apply strategies such as predicting, questioning, summarizing, and monitoring comprehension (Komariah et al., 2015). From a cognitive science perspective, CSI is additionally grounded in (Sweller, 1988). Cognitive Load Theory, which posits that effective learning depends on the efficient management of cognitive resources within a limited working memory system. The theoretical foundations of CSI integrate (Vygotsky, 1978) sociocultural theory of learning — particularly the concept of the Zone of Proximal Development and the gradual internalization of externally supported cognitive processes — with (Flavell, 1979) metacognitive theory, which emphasizes the critical role of self-monitoring and self-regulation in skilled cognitive performance.

In the context of narrative texts, the importance of CSI becomes even more pronounced due to the complexity of narrative structures, which require readers to understand plot development, character relationships, and implicit meanings (Sari et al., 2022) Additionally, learner characteristics such as proficiency level, motivation, and cognitive capacity influence the effectiveness of strategy instruction).

Previous systematic reviews and meta-analyses have highlighted the effectiveness of reading strategy instruction; however, most of them focus broadly on reading comprehension without specifically addressing the dual role of CSI in enhancing both cognitive processing and narrative text comprehension (Takallou, n.d.). This gap indicates the need for a systematic literature review that provides a focused and updated synthesis of empirical evidence on the effectiveness of CSI. Based on the identified gaps in the literature, this study aims to conduct a systematic literature review to examine the effectiveness of Cognitive Strategy Instruction in enhancing cognitive processing and reading comprehension of narrative texts. Specifically, this review seeks to address the following objectives: (1) to analyze how CSI influences learners' cognitive processing abilities; (2) to evaluate the extent to which CSI improves comprehension of narrative texts; and (3) to identify key instructional and learner-related factors that contribute to the effectiveness of CSI across different educational contexts.

Supporting Theory

Cognitive Learning Theory

Cognitive Theory posits that learning involves active mental processes such as attention, information processing, storage, and retrieval. cognitive strategies refer to the mental processes learners use to manipulate incoming information, such as repetition, elaboration, summarization, inferencing, and note-taking. These strategies enable learners to transform linguistic input into meaningful knowledge structures stored in long-term memory. In reading instruction, cognitive strategies help learners organize textual information, identify main ideas, and establish relationships among concepts, which ultimately enhance reading comprehension. Therefore, in the context of narrative reading, Cognitive Learning Theory explains how strategy instruction can facilitate deeper processing of story elements and improve comprehension outcomes In reading comprehension, this theory emphasizes that understanding a text requires learners to engage in higher-order thinking processes, including inferencing, analyzing, and integrating new information with prior knowledge. Cognitive Strategy Instruction (CSI) supports these processes by equipping learners with structured strategies that facilitate deeper cognitive engagement during reading activities (Baker & Brown, 1984).

Information Processing Theory

Information Processing Theory explains how information is received, processed, stored, and retrieved by the human cognitive system. This theory compares human cognition to a computer system in which information passes through several stages, including sensory memory, working memory, and long-term memory.

(Kintsch, n.d.)proposed the Construction-Integration Model, which explains reading comprehension as a process in which readers first construct meaning from textual information and then integrate that meaning with their prior knowledge. This process is especially important in narrative reading because readers must simultaneously process characters, settings, conflicts, and causal relationships while maintaining coherence across the text.

In the context of Cognitive Strategy Instruction, strategies such as inferencing, sequencing, and summarizing support the efficiency of working memory and facilitate the integration of textual information into long-term memory structures. Consequently, Information Processing Theory provides a strong explanation for how CSI enhances learners' cognitive processing during reading activities

Metacognitive Theory

Metacognitive Theory focuses on learners' awareness and regulation of their own thinking processes. This theory is highly relevant to Cognitive Strategy Instruction because successful strategy use often requires planning, monitoring, and evaluating one's comprehension.

(Flavell, 1979) defined metacognition as an individual's knowledge about their own cognitive processes and their ability to regulate these processes effectively. He identified key components of metacognition, including metacognitive knowledge, cognitive experiences, goals, and strategic actions.

In reading comprehension, metacognitive awareness enables learners to recognize comprehension difficulties, adjust reading strategies, and evaluate their understanding of the text. During narrative reading, learners may monitor whether they understand the plot, identify confusing sections, and apply repair strategies when comprehension breaks down. Therefore, Metacognitive Theory supports the idea that CSI improves not only cognitive performance but also learners' self-regulation during reading.

Moreover, Metacognitive Theory focuses on learners' awareness and regulation of their own cognitive processes. It includes key components such as planning, monitoring, and evaluating comprehension. In reading contexts, metacognitive strategies enable learners to control their understanding and adjust strategies when comprehension difficulties arise. CSI enhances metacognitive awareness by explicitly teaching students how to apply and regulate reading strategies effectively, leading to improved comprehension outcomes (Komariah et al., 2015)

Self-Regulated Learning Theory

Self-Regulated Learning Theory emphasizes learners' ability to manage their own learning processes, including cognitive, motivational, and behavioural aspects. In reading, self-regulated learners set goals, apply strategies, and reflect on their

comprehension. CSI promotes self-regulated learning by training students to independently use cognitive strategies, enhancing both their autonomy and reading performance (Kim et al., 2006)

Narrative Comprehension Theory

Narrative Comprehension Theory specifically explains how readers understand story-based texts by constructing mental representations of events, characters, goals, and causal relationships.

Objectives

In narrative reading instruction, cognitive strategies such as inferencing, sequencing, and summarizing support learners in understanding plot development and character relationships. Therefore, Narrative Comprehension Theory provides a direct explanation of how CSI contributes to improved comprehension of narrative texts (Arthur GraesserSingerTrabasso, n.d.)

Reading comprehension is not a unitary skill but a complex, dynamic cognitive process involving the simultaneous coordination of multiple sub-processes including word recognition, syntactic parsing, semantic integration, inference generation, and metacognitive monitoring (Kintsch, n.d.)

The construction of a coherent mental model of text requires readers to actively integrate textual information with prior knowledge, generate bridging and elaborative inferences to fill information gaps, and continuously monitor their own comprehension to detect and repair breakdowns (Cain & Oakhill, 2014).

Methodology

This study employed a systematic literature review design guided by the PRISMA 2020 framework to ensure transparency, rigor, and reproducibility in identifying, selecting, and synthesizing relevant studies. (Page et al., 2021)

Eligibility Criteria

The inclusion criteria were defined based on the PICOS framework. Studies were included if they: (1) involved students as participants (primary, secondary, or tertiary levels); (2) examined Cognitive Strategy Instruction (CSI) as the main intervention; (3) reported outcomes related to cognitive processing and/or reading comprehension, particularly narrative texts; (4) employed empirical research designs (quantitative, qualitative, or mixed methods); and (5) were published in peer-reviewed journals in English between 2020 and 2025. Studies were excluded if they: (1) were review articles, conference papers, or dissertations; (2) did not specifically address cognitive strategy instruction; or (3) lacked sufficient methodological detail.

Information Sources

A comprehensive literature search was conducted across major electronic databases, including Scopus, Web of Science, ERIC, and Google Scholar. These databases were selected due to their extensive coverage of high-impact and peer-reviewed educational research

Search Strategy
The search strategy employed a combination of keywords and Boolean operators to maximize retrieval. The primary search string included:
“cognitive strategy instruction” AND “reading comprehension” AND “narrative text” AND “cognitive processing”.
Additional synonyms such a s “metacognitive strategies,” “reading strategies,” and “text comprehension” were incorporated to broaden the search scope. The search was limited to titles, abstracts, and keywords, and filters were applied for publication years (2020–2025) and document type (journal articles).

Selection Process
The study selection followed the PRISMA flow procedure, including identification, screening, eligibility, and inclusion stages (Page et al., 2021) Initially, all retrieved records were exported and duplicates were removed. Titles and abstracts were then screened for relevance, followed by full-text assessment based on the eligibility criteria. The selection process was conducted independently, and disagreements were resolved through discussion to ensure consistency and minimize selection bias.

Data Collection Process
Data extraction was conducted using a standardized data extraction form. Key information from each study was systematically recorded, including author(s), publication year, research design, sample characteristics, intervention details, instruments used, and main findings. This structured approach ensured consistency and reliability in data collection.

Data Item
The extracted data items included: (1) study characteristics (author, year, country); (2) participant details (sample size, educational level); (3) intervention characteristics (type and duration of CSI); (4) outcome measures (cognitive processing indicators and reading comprehension performance); and (5) key findings related to the effectivene ss of the intervention.

Study Risk of Bias Assessment
The risk of bias in individual studies was assessed using established quality appraisal criteria, including clarity of research design, validity and reliability of instruments, and appropriateness of data analysis techniques. Studies were categorized into low, moderate, or high risk of bias to ensure critical evaluation of evidence quality.

Effect Measures
For quantitative studies, effect sizes (e.g., Cohen’s d, mean differences) were considered where available to evaluate the magnitude of CSI effectiveness. For qualitative studies, thematic findings related to cognitive processing and reading comprehension were analyzed to complement quantitative evidence (Kim et al., 2006).

Synthesis Methods
A narrative synthesis approach was employed due to heterogeneity in study designs, interventions, and outcome measures. The synthesis focused on identifying patterns, similarities, and differences across studies, particularly in terms of instructional effectiveness and influencing factors. Findings were grouped thematically to provide a comprehensive interpretation of the data.

Reporting Bias Assessmen
Potential reporting bias was assessed by examining publication trends, selective outcome reporting, and the availability of full-text articles. The inclusion of multiple databases and comprehensive search strategies helped minimize the risk of publication bias (Page et al., 2021)
Certainty Assessment.

Analysis

The study selection process followed the PRISMA 2020 guidelines, resulting in a transparent and systematic identification of relevant studies. A total of 245 records were initially identified through database searches across Scopus, Web of Science, ERIC, and Google Scholar. After removing 57 duplicates, 188 records remained for title and abstract screening. Of these, 142 studies were excluded due to irrelevance to Cognitive Strategy Instruction (CSI) or reading comprehension. The full texts of 46 articles were then assessed for eligibility, resulting in the exclusion of 28 studies due to methodological limitations or lack of relevant outcome measures. Ultimately, 18 studies met all inclusion criteria and were included in the final synthesis.

The included studies were conducted across diverse educational contexts, including primary, secondary, and tertiary levels, with sample sizes ranging from small classroom-based interventions to large-scale quasi-experimental studies. Most studies employed quantitative designs, particularly experimental and quasi-experimental approaches, while several utilized mixed-methods designs to capture both statistical outcomes and qualitative insights. The duration of interventions varied from short-term (4–6 weeks) to longer instructional programs (up to one semester). Across studies, Cognitive Strategy Instruction commonly involved strategies such as predicting, questioning, summarizing, and monitoring comprehension.

Regarding the risk of bias, the majority of studies were assessed as having moderate risk due to limitations in sample size, lack of randomization, or insufficient reporting of validity and reliability measures. However, several studies demonstrated low risk of bias, particularly those employing rigorous experimental designs and validated instruments. Overall, the methodological quality of the included studies was considered acceptable for synthesis, although variability across studies should be noted. The results of individual studies consistently indicated that Cognitive Strategy Instruction had a positive effect on both cognitive processing and reading comprehension. Specifically, students exposed to CSI demonstrated improved metacognitive awareness, enhanced inferential reasoning, and better integration of textual information. In terms of narrative reading comprehension, learners showed significant gains in identifying story structure, understanding main ideas, and interpreting implicit meanings.

The synthesis of results revealed several key patterns. First, CSI was most effective when implemented through explicit and scaffolded instruction, allowing learners to gradually internalize strategies. Second, the effectiveness of CSI was influenced by learners' proficiency levels, with lower-performing students benefiting more substantially from structured strategy instruction. Third, longer intervention durations tended to produce more sustained improvements in both cognitive processing and reading comprehension outcomes.

Findings and Discussion

In terms of reporting biases, the review identified a potential risk of publication bias, as studies reporting positive outcomes were more likely to be published. Additionally, limited reporting of null or negative findings may have influenced the overall interpretation of effectiveness. However, the use of multiple databases and comprehensive search strategies helped mitigate this risk

Pig.1Table PRISMA Guidellines

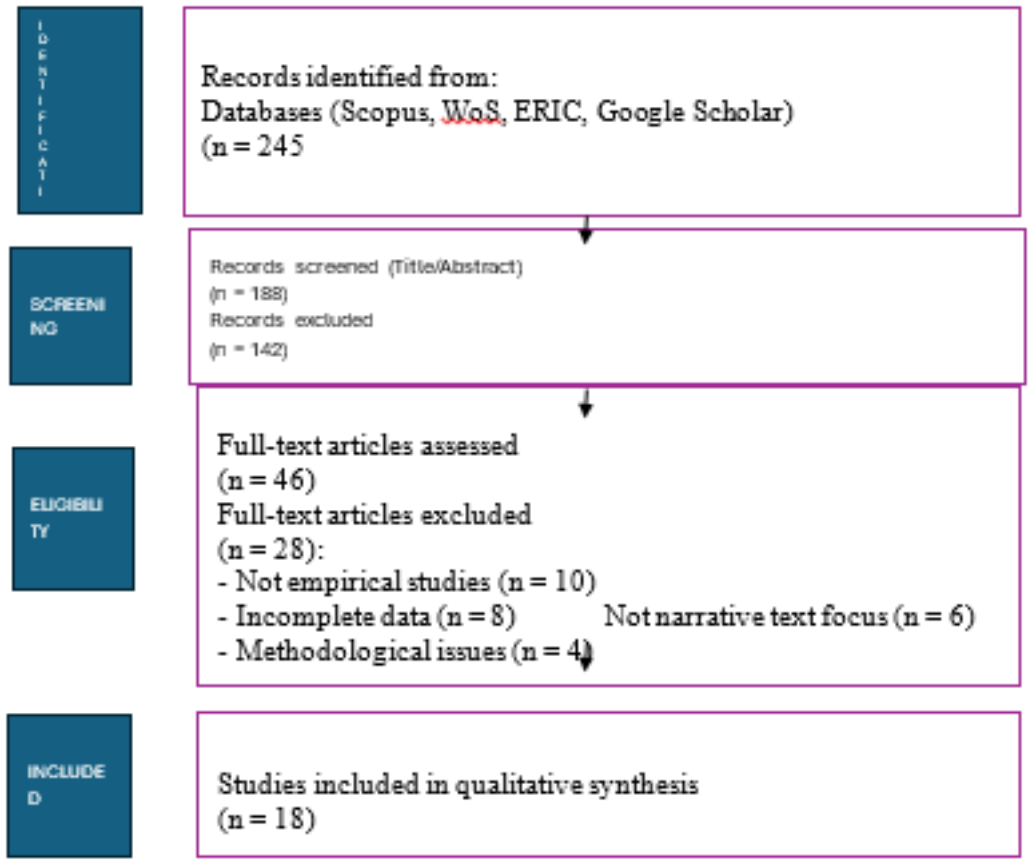

Table 1SLR Article Summary

No	Author(s) & Year	Title	Study Type	Key Findings
1	(Maeng, 2014).	The effectiveness of reading strategy instruction: A meta-analysis. English	present meta-analysis:	strategy instruction, reading strategies, reading comprehension, meta-analysis
2	(Sun et al., 2021),	The Relationship Between Reading Strategy and Reading Comprehension: A Meta-Analysis	present meta-analysis:	Lower-proficiency learners show greater improvement with structured CSI
3	(Tawarik et al., 2021)	Effect of CALLA metacognitive strategy instruction on reading	Quasi-experimental	CALLA, MSI, reading comprehension, reading awareness

		comprehension and reading awareness		
4	(Shaimaa Hamdy Abd El-Azeem Abd El-attah et al., n.d.)	Utilizing Inferencing Strategy for Developing EFL Reading Comprehension Skills Among Faculty of Education Students	Mixed-methods	Text Modification – Inferencing strategy – EFL reading comprehension skills
5	(Mehrdad et al., 2012)	The effect of teaching cognitive and metacognitive strategies on EFL students' reading comprehension across proficiency levels	Experimental	Cognitive strategies, metacognitive strategies, proficiency level, EFL student
6	(Reza Ahmadi et al., 2013)	The Importance of Metacognitive Reading Strategy Awareness in Reading Comprehension	Experimental	metacognitive reading strategy, reading comprehension, EFL students, teaching metacognitive strategy
7	(Amini et al., 2020)	Modeling the relationship between metacognitive strategy awareness, self-regulation and reading proficiency of Iranian EFL learners	Meta-analysis	metacognitive strategy awareness; self-regulation; structural equation modeling (SEM); second language; reading proficiency
8	(Sun et al., 2021)	The Relationship Between Reading Strategy and Reading Comprehension: A Meta-Analysis	present meta-analysis:	Lower-proficiency learners show greater improvement with structured CSI
9	(Mehrdad et al., 2012)	The effect of teaching cognitive and metacognitive strategies on EFL students' reading comprehension across proficiency levels	Experimental	Cognitive strategies, metacognitive strategies, proficiency level, EFL student
10	(Maeng, 2014)	The Effectiveness of Reading Strategy Instruction: A Meta-Analysis	present meta-analysis:	strategy instruction, reading strategies, reading comprehension, meta-analysis
11	(Sun et al., 2021))	The Relationship Between Reading Strategy and Reading Comprehension: A Meta-Analysis	present meta-analysis:	Lower-proficiency learners show greater improvement with structured CSI
12	(Khurram, 2023)	The Impact of Metacognitive Instruction on ESL University Level Students' Awareness and Use of the Reading Strategies	Action research	Keywordsmetacognitive reading strategies instruction, metacognitive awareness, strategy use, action research, tertiary, Pakistan
13	(Arrington et al., 2014)	The Contribution of Attentional Control and Working Memory to Reading	Experimental	*he Contribution of Attentional Control and Working Memory to Reading*

		Comprehension and Decoding		*Comprehension and Decoding"*
14	(Kavani & Amjadiparvar, 2018a)	The effect of strategy-based instruction on motivation, self-regulated learning, and reading comprehension ability of Iranian EFL learning	quasi-experimental research	Strategy-based instruction; motivation; self-regulated learning; reading comprehension
15	(Kavani & Amjadiparvar, 2018b)	The effect of strategy-based instruction on motivation, self-regulated learning, and reading comprehension ability of Iranian EFL learning	quasi-experimental research	Strategy-based instruction; motivation; self-regulated learning; reading comprehension
16	(Mirzahoseini et al., 2015)	A Contrastive Analysis of Adjuncts Regarding Their Manner of Expression in English and Persian	Contrastive Analysis	SFG, Manner of Expressing, Interpersonal, Experiential, Textual, Adjunct.
17	(Mehrdad et al., 2012)	The effect of teaching cognitive and metacognitive strategies on EFL students' reading comprehension across proficiency levels	Experimental	Cognitive strategies, metacognitive strategies, proficiency level, EFL student
18	(Ali & Razali, 2019)	A Review of Studies on Cognitive and Metacognitive Reading Strategies in Teaching Reading Comprehension for ESL/EFL Learners:	Analysis	reading comprehension, cognitive reading strategies, metacognitive reading strategies, English as a second language (ESL), English as a Foreign Language (EFL)

The synthesis of the 18 selected studies demonstrates that Cognitive Strategy Instruction (CSI) significantly enhances both cognitive processing and reading comprehension, particularly in narrative texts. Learners who receive explicit and structured strategy instruction show notable improvements in higher-order cognitive skills, including inferencing, summarizing, and integrating textual.

A key finding across the reviewed studies is the important role of metacognitive awareness in supporting the effectiveness of CSI. Students who are trained in cognitive strategies develop stronger abilities to plan, monitor, and evaluate their understanding In addition, self-regulated reading practices further enhance comprehension outcomes, as learners become more reflective and autonomous in managing their reading processes. In the context of narrative texts, CSI is particularly effective due to the complexity of narrative structures. Learners are required to understand elements such as plot, characters, and implicit meanings. Evidence shows that CSI helps students identify key story components and construct deeper interpretations of texts, nother important aspect highlighted in the review is the variation in CSI effectiveness across learner proficiency levels. Lower-proficiency learners tend to benefit more from explicit and scaffolded instruction because it provides structured guidance that supports their limited cognitive resources (Kim et al., 2006).

Despite these positive findings, several limitations are identified across the reviewed studies. There is considerable variation in research design, sample characteristics, and measurement tools, which may affect the comparability of results (Page et al., 2021). Overall, this review provides a comprehensive synthesis of the role of CSI in enhancing cognitive processing and narrative reading comprehension. The findings highlight the importance of integrating cognitive, metacognitive, and affective dimensions in reading instruction. From a pedagogical perspective, educators are encouraged to implement CSI through explicit teaching, scaffolding, and guided practice while adapting instruction to learners' needs and proficiency levels.

Conclusion

This systematic literature review confirms that Cognitive Strategy Instruction (CSI) is effective in improving students' cognitive processing and narrative reading comprehension. Based on 18 selected studies, CSI consistently enhances inferencing, metacognitive awareness, and understanding of narrative texts. The findings also show that explicit and structured instruction produces better learning outcomes, especially for lower-proficiency learners. Despite some methodological limitations across studies, CSI remains a valuable instructional approach for improving reading comprehension in language learning context.

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