



AN INVESTIGATION INTO THE IMPACT OF COGNITIVE STRATEGIES ON IRANIAN FEMALE HIGH SCHOOL STUDENTS' READING COMPREHENSION

Asma Sharifi*

Department of English, Abadan Branch, Islamic Azad University, Abadan, Iran
asmasharifi607@gmail.com

Received: October 9, 2025 Accepted: October 10, 2025 Published: November 28, 2025

Abstract

This study explored the impact of cognitive strategies on reading comprehension among pre-intermediate English as Foreign Language (EFL) learners. A total of fifty female students, aged 17-18, from Esteghamat High School in Khoramshahr City, Iran, participated in the study. Participants were selected based on their performance on the Oxford Quick Placement Test (OQPT) and were randomly assigned to either an experimental group (n=25) or a control group (n=25). The experimental group was trained to use cognitive strategies, including summarizing, predicting, and making inferences during reading activities, while the control group continued with conventional reading methods. Data were collected through pre- and post-test assessments of reading comprehension. The results indicated that the experimental group significantly outperformed the control group, demonstrating improved reading comprehension skills. The findings suggest that the use of cognitive strategies, such as summarizing, predicting, and making inferences, can enhance EFL learners' ability to understand and retain reading material. The study concludes by discussing the implications for teaching practices, material development, and future research in the area of cognitive strategy training for reading comprehension.

Keywords: cognitive strategies, reading comprehension Iranian EFL learners

INTRODUCTION

Reading comprehension is critical for academic success and lifelong learning, as it enables individuals to extract meaningful information from texts, engage in critical thinking, and apply acquired knowledge (Habók et al., 2024). It plays a central role in nearly all areas of education, from elementary schooling through higher education, and contributes to the development of cognitive, linguistic, and critical thinking skills. Reading comprehension is a key predictor of academic success. Studies show that students' ability to understand and analyze texts is strongly correlated with performance in other areas, such as writing and problem-solving (Anderson & Freebody, 1981).

Reading comprehension fosters critical thinking by enabling readers to engage with different viewpoints, evaluate evidence, and make inferences (Aloqaili, 2011). It is through reading that students encounter new ideas and perspectives that challenge their thinking and help

them develop analytical skills (Snow, 2002). The ability to comprehend written material is essential for lifelong learning and informed citizenship. Individuals with strong reading comprehension skills can access and engage with information from diverse sources, which is necessary for personal development and active participation in society (National Reading Panel, 2000).

Reading comprehension is the mental process the reader goes through in an effort to understand the content of a reading text. Kendeou (2014) states that "reading comprehension is a process to understand, use, reflect on, and engage written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society. Francois (2016) explains that in comprehension of a reading, the reader not only pronounces written symbols, but also seeks to understand and interpret the information contained in the text. Srisang and Everatt (2021) reveal that the ability to read is basically the ability to understand the information conveyed by the author in the reading text.

Further, Williams and Vaughn (2019) describe reading as a process of interaction, involving a reader engaging with the information submitted by the author through the text. Through this process, the reader seeks to understand, evaluate, and utilize the information and ideas being presented. In reading comprehension, to understand the text, the reader needs to apply a comprehension strategy appropriate to the text they read. These strategies include selecting, predicting, confirming, and validating the results of the understanding (Ali et al., 2022; Namaziandost et al., 2020, 2021).

The use of these strategies has an effect on the reader's success in comprehending the content of the text (Young Park, 2020). This means that the use of the right strategy can optimize the results of comprehension while the use of inappropriate strategies can be a barrier to the success of comprehension. In the learning process of reading, teachers should introduce and train students to utilize appropriate strategies in the comprehension of reading texts. In traditional teaching methods of reading, teachers generally only apply the principle of task, work, and evaluation. Through this principle, teacher-student interaction is achieved only by assigning tasks or questions to students; students working on and answering teacher questions; then teachers assessing student answers (Porath, 2014, p. 627). Such learning interaction does not provide a meaningful experience for students because students do not play an active role in building their learning experience.

To achieve effective reading comprehension, cognitive strategies must control, regulate, or evaluate specific actions in order to be carried out. Cognitive strategies are "those strategies that involve direct manipulation of the target language materials, such as summarizing, rehearsing, and deducing" (Oxford, 1990, p. 18). These strategies are essential for learners to process new language information effectively and to develop language skills. Cognitive strategies are "mental processes used to acquire and apply knowledge, such as organizing information, making connections, and visualizing concepts" (Schunk, 2012, p. 144). These strategies help learners internalize new information and solve problems efficiently. Cognitive strategies are "techniques that learners use to process and store new information, such as chunking, rehearsal, and categorization" (Ellis, 2008, p. 133). These strategies are fundamental for enhancing learners' ability to retain and use knowledge.

Cognitive strategies are conscious, deliberate and purposeful processes. Cognitive strategies for reading comprehension can allow students to make sufficient progress, become very important critical factors, and influence the development of personal learning skills that students use in reading (Wahyono, 2019). The use of cognitive strategies is undoubtedly a crucial component of understanding reading material that will support academic excellence

in any field of education. Students who correctly understand all types of information in their native language or any other foreign language will be able to use that information correctly and solve real-world situations (Takal et al., 2021).

There are cognitive strategies which are helpful to improve reading comprehension such as skimming, skimming, guessing meaning in context, summarizing, predicting, questioning, visualizing while reading. Skimming means speed reading. It is a reading strategy used to understand a text and find the main ideas. To do this, students read the first and last paragraphs in addition to the title and subtitle (Elder, 2008). Scanning, on the other hand, is called as searching for specific information; for example, dates and names (Harmer, 2007). Furthermore, students can guess the meaning of words in context. Additionally, students can take notes (Aziza & Abu, 2019) and use graphic organizers, chains of events, or any kind of drawing to summarize or paraphrase the text (Rodriguez, 2021). Students can also predict texts; then, they corroborate or reject their assumptions. Moreover, students make questions to develop reading comprehension. Finally, students visualize scenes while reading and improve their text understanding (Aziza & Abu, 2019).

STATEMENT OF THE PROBLEM

EFL students encounter multiple challenges in reading comprehension stemming from various sources. On the teachers' side, common practices such as focusing predominantly on reading aloud rather than fostering comprehension skills can limit students' ability to understand and engage with the material. Often, reading aloud is emphasized as a primary skill, while comprehension—which requires deeper cognitive engagement—is neglected. This imbalance can prevent students from developing the analytical and inferential skills necessary for effective comprehension.

From the curriculum's side, a lack of emphasis on reading comprehension also poses a barrier. Many EFL curricula are structured around vocabulary acquisition, pronunciation, and basic grammar, with less focus on comprehension strategies that enable students to interpret and internalize text meaning. As a result, EFL students may not receive adequate exposure to materials and exercises that challenge them to think critically or apply comprehension techniques.

Furthermore, student-related factors such as lack of motivation can significantly impact reading comprehension. EFL students often experience low motivation due to the perceived difficulty of the language, lack of interest in the reading materials, or the challenges of understanding complex texts in a non-native language. Motivation is a crucial component of reading comprehension, as students need to be willing to engage with and persevere through challenging content.

Finally, the lack of parental support can also contribute to EFL students' reading comprehension difficulties. When parents do not actively support language learning outside the classroom—whether due to limited language proficiency themselves, time constraints, or lack of understanding of the importance of reading—students miss out on reinforcement of reading practices that could otherwise strengthen their skills. These factors collectively highlight that reading comprehension issues in EFL contexts are rooted at the school level, requiring a holistic approach to address them. To alleviate these challenges, implementing effective strategies in EFL classes can be highly beneficial. One promising approach is the incorporation of cognitive strategies, which empower students to actively process and make sense of texts. Cognitive strategies—such as skimming, scanning, predicting, summarizing, questioning, and contextual guessing—help students engage with texts on a deeper level, improving both comprehension and retention.

By integrating these cognitive strategies into reading instruction, EFL teachers can foster critical thinking and comprehension skills among students. Teachers can model these strategies during lessons, provide practice exercises that encourage independent use, and offer feedback to refine students' skills. Such methods not only improve comprehension but also enhance students' overall language proficiency, encouraging motivation and confidence in their reading abilities.

This study aimed to answer the following research question:

RQ1. Does using cognitive strategies have any significant effect on Iranian high school students' reading comprehension?

Based on the above-mentioned question, the following null hypothesis was suggested:

HO1. Using cognitive strategies does not have any significant effect on Iranian high school students' reading comprehension.

LITERATURE REVIEW

In today's fast-evolving world, the ability to adapt, think critically, be creative, and engage in entrepreneurial ventures, alongside strong ICT management skills, are increasingly regarded as fundamental educational outcomes (Van Le et al., 2024). These skills not only foster personal development but also prepare students to succeed in a globally interconnected, technology-driven society. To nurture these competencies, educational practices must focus on promoting effective learning strategies, particularly in the context of reading. According to Rahmat and Muhamad (2020), one of the essential skills that students can develop is taking responsibility for their learning strategies, which are closely linked to reading comprehension. This suggests that students need to adopt strategies that promote better understanding and retention of the material they engage with, ultimately enhancing their academic performance.

Reading comprehension is not merely about decoding words, but about engaging in complex cognitive processes that involve understanding, interpreting, and applying information (Pisanie, 2020). These processes include identifying main ideas, making inferences, and organizing information meaningfully. Additionally, regulating cognitive processes such as attention and memory is essential for effective comprehension. Metacognitive awareness—knowing how to regulate one's cognitive processes—prior knowledge, and motivation significantly influence the quality of reading comprehension (Takal et al., 2021). Therefore, language learning, particularly in reading, is closely tied to the cognitive strategies employed by learners (Harmer, 2007). These cognitive strategies, when effectively developed, form the foundation for academic achievement across various disciplines.

Cognitive strategies play an integral role in the development of reading skills, which are crucial for academic success. Effective readers do not merely absorb information; they actively engage with the text to process and apply it (Caverly et al., 2004). By mastering strategies such as skimming, scanning, predicting, summarizing, and questioning, students can enhance their reading efficiency and deepen their understanding of texts (Wu et al., 2023). The strategic use of these cognitive techniques also helps students in applying what they read to solve real-world problems, reinforcing their ability to think critically and independently.

For example, skimming allows readers to quickly grasp the central ideas of a text, making it a useful tool for previewing material (Wright & Dunsmuir, 2019). Scanning, on the other hand, helps readers locate specific information within the text, such as keywords or dates

(Harmer, 2007). Predicting involves making guesses about the content of a text before reading it, helping readers stay engaged and develop a sense of anticipation. Questioning encourages active engagement with the text by prompting readers to ask questions about the material, further stimulating critical thinking. Visualizing helps create mental images of scenes or concepts while reading, making abstract ideas more concrete and facilitating comprehension (Aziza & Abu, 2019).

The use of cognitive strategies in reading not only enhances comprehension but also contributes to the development of independent learning skills (Tabrizi et al., 2021). When students consciously apply strategies to manage their learning, they are better equipped to monitor their progress, evaluate their understanding, and adjust their approach as needed. This self-regulation fosters autonomy, which is a key element of lifelong learning. By refining their cognitive strategies, students become more adept at managing complex information, making connections across subjects, and applying knowledge to solve problems (Anderson & Tension, 2016). These strategies also encourage critical thinking, as they require students to actively question, analyze, and synthesize information rather than passively absorb it. As students improve their ability to think critically and solve problems, they are better prepared to tackle challenges in academic and professional settings. Ultimately, the development of cognitive strategies through reading instruction helps cultivate not only strong reading comprehension skills but also the broader cognitive abilities needed for success in the modern world (Seufert, 2018).

Numerous empirical studies have examined the impact of cognitive strategies on reading comprehension, highlighting their significant role in academic achievement. For instance, Suyitno (2017) investigated how the use of cognitive strategies contributed to students' reading comprehension scores. The study found that students employed a variety of cognitive strategies, such as summarizing and questioning, to improve their comprehension of texts. The correlation analysis indicated that the use of cognitive strategies, when selected appropriately, positively impacted reading comprehension outcomes.

Similarly, Van Thang and Huyen Anh (2019) studied the effects of cognitive reading strategies on non-English major students' reading comprehension at a language school. Their research showed that the experimental group (EG), which employed cognitive reading strategies, exhibited significantly greater improvements in reading comprehension than the control group (CG). Additionally, students in the EG demonstrated positive attitudes towards the use of cognitive strategies in reading instruction.

Tabrizi, Alinia Bengar, and Alinia Bengar (2021) examined the impact of cognitive strategies on reading and vocabulary learning in high school students. Their study found that cognitive strategies, such as summarizing and re-reading, led to significant improvements in both reading comprehension and vocabulary acquisition. The study also indicated that cognitive strategies were equally effective for male and female students, highlighting their broad applicability across different demographics.

Further research by Reina-Reina et al. (2023) explored the effect of cognitive stimulation programs on reading comprehension in Spanish Language and Literature. The study revealed that cognitive interventions led to significant improvements in students' reading comprehension scores, as well as their overall academic performance in the subject. These findings underscore the effectiveness of cognitive strategies in improving students' comprehension and academic achievement.

In the context of second-language learning, Yang et al. (2023) examined the role of basic linguistic skills and cognitive skills in reading Chinese as a second language. Their study

demonstrated that higher-order cognitive skills, such as inference making and reading monitoring, were critical to reading comprehension in a second language. Furthermore, linguistic skills and working memory indirectly contributed to reading comprehension by enhancing these higher-order cognitive skills.

Lastly, Fierro López and Lara-Velarde (2023) assessed the effectiveness of cognitive strategies in improving reading comprehension among university students. Their study found that the experimental group, which received instruction on cognitive strategies such as skimming, scanning, and summarizing, showed significant improvements in reading comprehension compared to the comparison group. This reinforced the idea that cognitive strategies can be highly effective in enhancing students' comprehension skills.

The application of cognitive strategies in reading is essential for improving comprehension and supporting academic success. These strategies not only enhance students' ability to understand and retain information but also foster critical thinking, problem-solving, and independent learning. By adopting and refining cognitive strategies, students can navigate complex texts with greater ease, make meaningful connections between new and existing knowledge, and apply their learning to real-world situations. Educators can play a key role in supporting students' development of these strategies, empowering them to become more effective and autonomous learners. As cognitive strategies continue to be integrated into educational practices, students will be better prepared to succeed in both academic and professional settings, contributing to their long-term success in a rapidly changing world.

METHOD

The current study employed a quasi-experimental design, utilizing pre- and post-tests to measure the impact of cognitive reading strategies on EFL learners' reading comprehension. The research included two groups: an experimental group, which received instruction involving specific cognitive strategies, and a control group, which followed a conventional reading instruction approach without these strategies. This design was chosen to compare the effectiveness of cognitive reading strategies with traditional methods, allowing for assessment of changes in reading comprehension outcomes.

Fifty participants were chosen from a pool of 87 students based on their performance on the Oxford Quick Placement Test (OQPT). These participants were selected from Esteghamat High School in Khoramshahr City, Iran. All participants were pre-intermediate in English proficiency, as determined by their OQPT results, and were between the ages of 17 and 18. The participants, all female, shared Persian as their first language. To ensure confidentiality, participants were informed that their personal information and responses would be kept strictly anonymous and used solely for research purposes. Additionally, written consent was obtained from all participants before the study began. Using a random assignment process, the fifty participants were equally divided into two groups: an experimental group and a control group, each consisting of 25 students.

The first instrument used in the study was the Oxford Quick Placement Test (OQPT), administered to standardize the participants' proficiency levels. The OQPT, which contains 60 multiple-choice items, helps categorize learners into levels: beginners (0–10), elementary (10–29), pre-intermediate (30–39), intermediate (40–47), advanced (48–54), and very advanced (55–60). Only those classified as pre-intermediate (scoring 30–39) were selected for the study. The OQPT's validity was confirmed by linguistic experts, and its reliability was established at .91 through prior piloting.

The second instrument was a reading comprehension test, specifically developed by the researcher and based on the content in the participants' course book. This test included 40 objective questions in formats such as multiple-choice, true-or-false, and fill-in-the-blank questions. The KR-21 formula was applied to establish reliability for this test, which yielded a reliability coefficient of .83, ensuring consistency. Additionally, faculty members from Azad University of Abadan verified the test's validity, and the instrument was piloted to refine its accuracy. The test was administered both as a pre-test and a post-test, given to all participants before and after the instructional treatment, to gauge changes in reading comprehension.

The data collection process began with administering the OQPT to establish the participants' homogeneity in English proficiency. Following the test, fifty students were selected as the study's target population and were randomly assigned to the experimental and control groups. Both groups then took the reading comprehension pre-test to assess their initial reading proficiency levels.

For the next phase, only the experimental group received treatment, which involved instruction using cognitive reading strategies. The control group, however, did not receive this specialized instruction. The cognitive strategies introduced to the experimental group included skimming, scanning, guessing meaning from context, summarizing, predicting, questioning, and visualizing. These strategies were taught through seven reading passages over a series of ten instructional sessions. The procedure was structured as follows: in the first two sessions, the OQPT and reading pre-test were administered; the subsequent seven sessions were dedicated to implementing the treatment; and, in the final session, both groups completed the reading comprehension post-test. This post-test allowed the researcher to evaluate the treatment's effect on reading comprehension.

The data collected from both pre- and post-tests were analyzed using SPSS software (version 26). First, the Kolmogorov-Smirnov (K-S) test was applied to confirm data normality. Descriptive statistics, including mean and standard deviation, were calculated next to summarize the data. Paired samples t-tests were conducted to measure within-group differences (pre- and post-treatment) for each group, while independent samples t-tests were used to assess the differences between the experimental and control groups' post-test results, thereby identifying the effect of the treatment on the participants' reading comprehension.

RESULTS AND DISCUSSIONS

In order to analyze the collected data, the SPSS software, version 26 software was used.

Table 1. Normality Test Results for Pretest and Posttest Scores

		EG Pre	CG Pre	EG Post	CG Post
N		25	25	25	25
Normal Parameters	Mean	11.68	12.26	16.78	14.32
	Std. Deviation	3.13	3.22	2.34	3.57
Most Extreme Differences	Absolute	.14	.12	.14	.13
	Positive	.14	.12	.08	.09
	Negative	-.13	-.12	-.14	-.13

Test Statistic	.14	.12	.14	.13
Asymp. Sig. (2-tailed)	.17 ^c	.20	.20	.20

The results of the Kolmogorov-Smirnov test indicate that the pretest and posttest scores for both the experimental group (EG) and control group (CG) are normally distributed ($p > .05$). This confirms that parametric tests, such as t-tests, are appropriate for further analysis.

Table 2. Descriptive Statistics of Pretest Scores

Groups	N	Mean	Std. Deviation	Std. Error Mean
EG	25	11.68	3.13	.62
CG	25	12.26	3.22	.64

The mean pretest score of the EG is 11.68, while the CG scored slightly higher with a mean of 12.26. The standard deviations are similar, indicating comparable variability in scores across both groups before the intervention.

Table 3. Independent Samples t-Test for Pretest Scores

F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
.00	.94	.64	48	.52	.58	.89
		.64	47.95	.52	.58	.89

The independent samples t-test shows no significant difference between the pretest scores of EG and CG ($t = -0.645$, $p = .522$). This suggests that the two groups were statistically equivalent in reading comprehension before the cognitive strategy intervention.

Table 4. Descriptive Statistics of Posttest Scores

Groups	N	Mean	Std. Deviation	Std. Error Mean
Scores EG	25	16.78	2.34	.46
CG	25	14.32	3.57	.71

The EG has a higher posttest mean score (16.78) compared to the CG (14.32). The lower standard deviation in the EG indicates less variability in their posttest scores, potentially reflecting a more consistent effect of the intervention.

Table 5. Independent Samples t-Test for Posttest Scores

F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
4.82	.03	2.87	48	.00	2.46	.85
		2.87	41.40	.00	2.46	.85

The independent samples t-test reveals a statistically significant difference between the posttest scores of EG and CG ($t = 2.87$, $p = .00$). The EG scored significantly higher than the CG, with a mean difference of 2.46, suggesting that the use of cognitive strategies positively affected the reading comprehension of the EG.

Table 6. Paired Samples t-Test Results

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
CG	-.58	4.18	.83	-2.30	1.14	-.69	24	.49
EG	2.46	3.84	.76	.87	4.04	3.20	24	.00

The paired samples t-test for the EG reveals a significant improvement from pretest to posttest ($t = 3.20$, $p = .00$). In contrast, the CG does not show a statistically significant change ($t = -0.69$, $p = .49$). This further supports the efficacy of cognitive strategies in enhancing the reading comprehension of the EG.

The results of this study indicated that the experimental group outperformed the control group on the reading post-test, confirming that the use of cognitive strategies significantly enhanced Iranian high school students' reading comprehension. Consequently, the null hypothesis (HO1: "Using cognitive strategies does not have any significant effect on Iranian high school students' reading comprehension") was rejected. These findings are in concert with Suyitno (2017), who also highlighted the positive impact of cognitive strategies on students' comprehension scores. Suyitno's study emphasized that cognitive strategies could boost reading comprehension by helping students process and retain information more effectively, which aligns with the current study's results.

Moreover, the findings are in line with Van Thang and Huyen Anh (2019), who investigated the effects of cognitive reading strategies on non-English major students' reading comprehension at a Language School. Their study revealed that cognitive strategies not only improved students' reading comprehension but also positively influenced their attitudes toward the reading process. Similarly, the present study found that cognitive strategies can significantly enhance reading skills, suggesting that these strategies are universally beneficial across different student groups.

The results of this study also correspond with the findings of Tabrizi, Alinia Bengar, and Alinia Bengar (2021), who identified the meaningful impact of cognitive strategies on reading comprehension and vocabulary development in high school students. Their research suggested that cognitive strategies offer a valuable alternative to traditional teaching methods, a point that is supported by the current findings, which indicate that cognitive strategies can effectively replace or complement traditional reading methods.

Additionally, the current results are consistent with Reina-Reina et al. (2023), who explored the effects of a cognitive stimulation program on students' reading comprehension and academic performance in Spanish Language and Literature. Their study demonstrated that cognitive stimulation programs significantly improved students' academic performance,

which resonates with the current study's conclusion that cognitive strategies enhance reading comprehension in Iranian high school students.

Finally, the results align with the findings of Fierro López and Lara-Velarde (2023), who assessed the effectiveness of cognitive strategies in improving university students' reading comprehension. Their research confirmed that cognitive strategies lead to improved comprehension, a conclusion that mirrors the current study's findings, further suggesting that cognitive strategies are an effective tool across various educational levels and disciplines.

In conclusion, the results of this study are consistent with previous research, supporting the efficacy of cognitive strategies in improving reading comprehension across diverse student populations and educational contexts. The significant positive impact of cognitive strategies in the current study is in concert with the findings of Suyitno (2017), Van Thang and Huyen Anh (2019), Tabrizi et al. (2021), Reina-Reina et al. (2023), and Fierro López and Lara-Velarde (2023), further establishing the importance of these strategies in enhancing reading comprehension.

The findings of this study, which highlight the positive impact of cognitive strategies on reading comprehension, can be explained through several well-established theories in educational psychology and cognitive science. These theories help clarify how and why cognitive strategies can improve reading comprehension and other academic skills. Cognitive Load Theory (Sweller, 1988) suggests that learning is most effective when instructional methods are designed to minimize unnecessary cognitive load, allowing learners to focus their mental resources on understanding and processing information. Cognitive strategies, such as summarizing and predicting, help to manage cognitive load by guiding learners to focus on key information and engage in active processing. In the context of this study, the use of these strategies likely helped students process the reading material more effectively, reducing extraneous cognitive load and enhancing comprehension. This finding is aligned with the results, where cognitive strategies significantly improved reading comprehension.

Metacognitive Theory (Flavell, 1979) highlights the importance of students' awareness and regulation of their own thinking processes. Students who are able to control their cognitive processes—such as by summarizing, questioning, or predicting—are generally more effective learners. Cognitive strategies require students to monitor their understanding and adjust their reading behaviors accordingly. For example, by making predictions and inferences about the text, students actively engage with the material and check for comprehension, leading to better retention and understanding. The positive impact of cognitive strategies in this study can be seen as a reflection of metacognitive processes, where students used these strategies to enhance their understanding of the text.

Schema Theory (Anderson, 1984) further supports these findings by explaining that comprehension is influenced by the mental frameworks (schemas) individuals use to process and interpret new information. When students use cognitive strategies like making connections or predicting, they activate their prior knowledge or existing schemas, which helps them make sense of the material. In this study, students who employed cognitive strategies were likely able to activate and apply relevant schemas, enhancing their ability to understand and retain the information. This aligns with the study's finding that cognitive strategies improved reading comprehension by helping students connect new knowledge with what they already knew.

The results also resonate with Constructivist Learning Theory, which suggests that learners actively construct their own understanding and knowledge based on their experiences. According to Piaget (1972) and Vygotsky (1978), learning is a process that involves both social interaction and cognitive development, where learners build new knowledge by engaging with the environment and making sense of information. Cognitive strategies encourage active learning and problem-solving, which aligns with constructivist principles. By engaging in higher-order thinking, such as predicting, summarizing, and making connections, students actively construct meaning from the text, leading to better comprehension. This constructivist perspective is consistent with the results of the study, which show that cognitive strategies helped enhance reading comprehension.

Moreover, Information Processing Theory (Atkinson & Shiffrin, 1968) supports the findings by likening the human mind to a computer, suggesting that learning involves the encoding, storage, and retrieval of information. Cognitive strategies help students process information more efficiently, making it easier to store and retrieve. Strategies like summarizing, predicting, and making inferences facilitate the encoding and organization of information, which enhances comprehension and recall. The improved performance of the experimental group in this study is consistent with this theory, where cognitive strategies helped students process and retrieve information more effectively.

Dual Coding Theory (Paivio, 1986) provides further support, suggesting that information is processed through both verbal and visual channels. By engaging both channels, learners are able to encode and retain information more effectively. Cognitive strategies such as visualization and summarizing can help learners create both verbal and mental images of the text, making it easier to understand and remember the material. The study's results, where cognitive strategies improved reading comprehension, align with Dual Coding Theory, as these strategies likely encouraged students to create richer, more detailed mental representations of the reading material.

Finally, Vygotsky's Zone of Proximal Development (ZPD) (1978) also supports the findings. ZPD emphasizes the importance of scaffolding and guidance in the learning process. Cognitive strategies can be viewed as a form of scaffolding that helps students move from their current level of understanding to a higher level. By using strategies like predicting, summarizing, and making inferences, students receive the support they need to engage with the text in more sophisticated ways. The study's results, which indicate that cognitive strategies improved reading comprehension, align with Vygotsky's theory, as these strategies provided students with the necessary support to deepen their understanding and bridge gaps in their learning.

CONCLUSION, IMPLICATIONS, AND LIMITATIONS

This study demonstrated that cognitive strategies significantly improve reading comprehension among learners. By employing strategies such as summarizing, predicting, and making inferences, students were able to engage with the reading material more effectively, reduce cognitive overload, and activate prior knowledge, all of which contributed to enhanced comprehension. These findings were supported by various cognitive theories, including Cognitive Load Theory, Metacognitive Theory, Schema Theory, and Information Processing Theory, which together explain the mechanisms behind the observed improvements in reading comprehension. Overall, cognitive strategies help learners process and retain information more effectively, supporting their ability to understand complex texts and engage in higher-order thinking.

Learners can benefit from incorporating cognitive strategies into their reading routines. By summarizing key points, predicting what will come next in the text, and making inferences, they can better manage their cognitive resources, which leads to more effective and efficient learning. Additionally, cognitive strategies foster an active approach to reading, encouraging students to engage with the material on a deeper level. This not only improves comprehension but also enhances retention and long-term understanding of the content. Furthermore, by using cognitive strategies, students develop their metacognitive skills, such as self-monitoring and self-regulation. These skills enable them to assess their own understanding and adjust their reading strategies accordingly, contributing to improved academic performance in other areas as well.

Teachers should consider explicitly teaching cognitive strategies as part of their instructional methods. By integrating techniques like summarizing, questioning, and predicting into the curriculum, educators can help students engage with texts more deeply and meaningfully. In addition, teachers can scaffold the use of cognitive strategies, especially for struggling readers. Through guided practice, teachers can model how to use these strategies, and over time, students can become more independent in applying them. Moreover, teachers should encourage students to reflect on their thinking processes while reading. This could involve asking students to verbalize their predictions, summarize key points, or think aloud as they read, thereby fostering metacognitive awareness and enhancing comprehension.

Educational materials should include prompts that encourage the use of cognitive strategies. For example, material developers can incorporate sections where learners are asked to summarize paragraphs, make predictions about the text, or reflect on what they already know about the topic. When designing reading materials, it is also essential to consider the principles of Cognitive Load Theory. Materials should be designed to minimize unnecessary distractions or overly complex information, allowing learners to focus their cognitive resources on processing the essential content. Additionally, developers should include tools and resources that help scaffold learners' use of cognitive strategies, such as graphic organizers, prediction guides, or self-monitoring checklists. These tools can assist learners in tracking their thinking and enhancing their reading comprehension.

One limitation of this study is the relatively small sample size of fifty participants, which may limit the generalizability of the findings to a broader population. Additionally, the sample was drawn from a single high school in Khoramshahr City, Iran, which may not represent the diverse range of educational settings and cultural backgrounds in other regions. The study focused exclusively on female participants, which limits the applicability of the results to male students. Moreover, the participants were all pre-intermediate in English proficiency, which narrows the scope of the findings to this specific proficiency level and may not be applicable to students with different levels of language proficiency. Another limitation is the use of the Oxford Quick Placement Test (OQPT) to assess participants' English proficiency, as this test may not capture all aspects of language ability and might not fully align with the needs of the participants in terms of assessing their reading comprehension skills.

Future studies should consider including a larger and more diverse sample, such as participants from multiple schools or regions, to improve the generalizability of the findings. Additionally, including both male and female participants could provide a more balanced perspective on the effectiveness of cognitive strategies in reading comprehension. Research could also explore a wider range of proficiency levels, from beginner to advanced, to examine whether the use of cognitive strategies differs across various stages of language

acquisition. To improve the assessment of participants' language proficiency, future studies may benefit from using a combination of assessment tools, such as language performance tasks or reading comprehension tests, in addition to the OQPT. Finally, investigating the long-term effects of cognitive strategy use on reading comprehension would be valuable to determine whether these strategies lead to sustained improvements over time.

REFERENCES

- Aloqaili, A. S. (2011). The relationship between reading comprehension and critical thinking: A theoretical study. *Journal of King Saud University - Languages and Translation*, 24(1), 35–41. <https://doi.org/10.1016/j.jksult.2011.01.001>
- Ali, Z., Palpanadan, S. T., Asad, M. M., Churi, P., & Namaziandost, E. (2022). Reading approaches practiced in EFL classrooms: a narrative review and research agenda. *Asian-Pacific Journal of Second and Foreign Language Education*, 7(1). <https://doi.org/10.1186/s40862-022-00155-4>
- Anderson, J. R., & Tension, C. (2016). Phases of learning: How skill acquisition impact cognitive processing. *Cognitive Psychology*, 87, 1–28. <https://doi.org/10.1016/j.cogpsych.2016.03.001>
- Anderson, R. C. (1984). Role of the reader's schema in comprehension and memory. *Cognitive Science*, 8(4), 311-352.
- Anderson, R. C., & Freebody, P. (1981). *Vocabulary knowledge and reading comprehension*. In J. T. Guthrie (Ed.), *Comprehension and teaching: Research reviews* (pp. 77-117). Academic Press.
- Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.), *The psychology of learning and motivation: Advances in research and theory* (Vol. 2, pp. 89-195). Academic Press.
- Aziza, A., & Abu, R. (2019). A Review of Studies on Cognitive and Metacognitive Reading Strategies in Teaching Reading Comprehension for ESL/EFL Learners. *English Language Teaching*, 12(6), 94-111. doi:10.5539/elt.v12n6p94
- Caverly, D. C., Nicholson, S. A., & Radcliffe, R. (2004). The effectiveness of strategic reading instruction for college developmental readers. *Journal of College Reading and Learning*, 35(1), 25–49. <https://doi.org/10.1080/10790195.2004.10850166>
- Elder, C. (2008). Fluency in reading and listening: The keys to understanding. *Journal of Language and Communication*, 17(4), 204-219.
- Ellis, R. (2008). *The study of second language acquisition* (2nd ed., p. 133). Oxford University Press.
- Fierro López, D., & Lara-Velarde, A. (2023). Cognitive strategies in the reading comprehension improvement. *Pol. Con*, 8(12), 597-611.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34(10), 906-911.
- Francois, J. (2016). The impact of teacher prompting and questioning on third grade students' comprehension. *Honors Program Theses*. 216. Retreved on April 12, 2017 from <http://scholarworks.uni.edu/hpt/216>

- Habók, A., Oo, T. Z., & Magyar, A. (2024). The effect of reading strategy use on online reading comprehension. *Heliyon*, 10(2), e24281. <https://doi.org/10.1016/j.heliyon.2024.e24281>
- Harmer, J. (2007). *How to teach English. First Edition*. England: Pearson Education.
- Kendeou, P. (2014). A cognitive view of reading comprehension: Implications for reading difficulties. *Learning Disabilities Research & Practice*, 29(1), pp. 10–16. <https://doi.org/10.1111/ldrp.12025>
- Namaziandost, E., Razmi, M. H., Ahmad Tilwani, S., & Pourhosein Gilakjani, A. (2021). The Impact of Authentic Materials on Reading Comprehension, Motivation, and Anxiety Among Iranian Male EFL Learners. *Reading & Writing Quarterly*, 38(1), 1–38. <https://doi.org/10.1080/10573569.2021.1892001>
- Namaziandost, E., Imani, A., Banari, R. & Shakibaei, G. (2020). An Investigation of Gender Differences in L2 Reading Accuracy and Fluency among Iranian Intermediate EFL Learners. *Journal of new advances in English Language Teaching and Applied Linguistics*, 2(1), 259-280.
- National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. National Institute of Child Health and Human Development.
- Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Newbury House.
- Paivio, A. (1986). *Mental representations: A dual coding approach*. Oxford University Press.
- Piaget, J. (1972). *The psychology of the child*. Basic Books.
- Pisanie, S. (2020). *The importance of reading skills in educational success*. *International Journal of Educational Studies*, 30(4), 300-314.
- Porath, S. (2014). Talk less, listen more: Conferring in the reader's workshop. *The Reading Teacher*, 67(8), pp. 627–635. <https://doi.org/10.1002/trtr.1266>
- Rahmat, S., & Muhamad, M. (2020). *Developing self-regulated learning strategies through reading comprehension*. *Journal of Educational Research*, 63(3), 21-38.
- Reina-Reina C, Conesa PJ and Duñabeitia JA (2023) Impact of a cognitive stimulation program on the reading comprehension of children in primary education. *Front. Psychol.* 13:985790. doi: 10.3389/fpsyg.2022.985790
- Rodriguez, A. (2021). The role of graphic organizers in improving reading comprehension. *International Journal of Language Education*, 12(1), 50-62.
- Schunk, D. H. (2012). *Learning theories: An educational perspective* (6th ed.). Pearson.
- Seufert, T. (2018). The interplay between self-regulation in learning and cognitive load. *Educational Research Review*, 24, 116–129. <https://doi.org/10.1016/j.edurev.2018.03.004>
- Snow, C. E. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. RAND Corporation.

- Srisang, P., & Everatt, J. (2021). Lower and Higher Level Comprehension Skills of Undergraduate EFL Learners and Their Reading comprehension. *LEARN Journal: Language Education and Acquisition Research Network*, 14(1), 427–454. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1284505.pdf>
- Suyitno, I. (2017). Cognitive Strategies Use in Reading Comprehension and its Contributions to Students' Achievement. *IAFOR Journal of Education*, 5(3), 107-121.
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257-285.
- Tabrizi, M., Alinia Bengar, H, & Alinia Bengar, E. (2021). The effectiveness of reading comprehension and vocabulary via cognitive strategies across gender. *Journal of new advances in English Language Teaching and Applied Linguistics*, 3(2), 652-668.
- Takal, G., Ibrahim, N., & Jamal, M. (2021). Communicative Language Teaching in Public Universities in Afghanistan: Perceptions and Challenges. *Theory and practice in Language studies*, 11(11), 1434-1444. doi:10.17507/tpls.1111.11
- Van Le, H., Nguyen, T. a. D., Le, D. H. N., Nguyen, P. U., & Nguyen, T. T. A. (2024). Unveiling critical reading strategies and challenges: a mixed-methods study among English major students in a Vietnamese higher education institution. *Cogent Education*, 11(1). <https://doi.org/10.1080/2331186x.2024.2326732>
- Van Thang, N., & Huyen Anh, B. (2019). The effects of cognitive reading strategies instruction (CRSI) on students' reading comprehension and their attitudes towards CRSI at the language school. *Journal of Inquiry into Languages and Cultures*, 3, 137-157.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wahyono, H. (2019). *Cognitive strategies and their effectiveness in enhancing reading skills among EFL learners*. *English Language Teaching Journal*, 15(4), 40-55.
- Williams, J., & Vaughn, M. (2019). Extensive vs. intensive reading: Approaches to text comprehension in education. *Journal of Reading and Literacy*, 21(3), 220-234.
- Wright, L., & Dunsmuir, S. (2019). Oral and silent reading: A comparative study on reader engagement and pace. *Journal of Reading Research*, 38(4), 232-246.
- Wu, L., Valcke, M., & Van Keer, H. (2023). Differential effects of reading strategy intervention for three levels of comprehenders: Focus on text comprehension and autonomous reading motivation. *Learning and Individual Differences*, 104, 102290. <https://doi.org/10.1016/j.lindif.2023.102290>
- Yang L, Xiong Y., & Chen, Q. (2023). The role of linguistic and cognitive skills in reading Chinese as a second language: A path analysis modeling approach. *Front. Psychol.* 14:1131913. doi: 10.3389/fpsyg.2023.1131913
- Young Park, A. (2020). A comparison of the impact of extensive and intensive reading approaches on the reading attitudes of secondary EFL learners. *Studies in Second Language Learning and Teaching*, 2(1) 44-56.