

Promoting Metacognitive Skills for Enhancing ESL Underachievers' Comprehension of English Reading: A Case Study in Saudi Arabia

Loussine Momdjian, TIS Schools, Saudi Arabia

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Abstract

The present study aimed to improve the reading comprehension of underperforming ESL students in a Saudi Arabian girls' school by investigating the effects of metacognitive strategies. For this purpose, three sixth-grade classrooms received specialized training and lessons on these strategies, while three other classrooms followed the standard curriculum with different teachers for comparison. Data collection included pre- and post-intervention comprehension tests and interviews. Quantitative analysis involved comparing test scores, while qualitative research assessed students' use of metacognitive strategies during interviews. A 5-point scale coding framework was used for qualitative analysis, with two coders achieving 80-90% agreement. The results unequivocally demonstrated the positive impact of metacognitive strategies on low-achieving students' reading comprehension. The significant increase in average test scores post-intervention substantiated the strategy's efficacy. This study underscores the potential benefits of targeted interventions and specialized lessons in ESL settings, ultimately enhancing academic performance for second-language learners.

Keywords: Metacognition, Metacognitive Strategies, Reading Comprehension, English as a Second Language, Underachievers

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Introduction

Reading comprehension plays a pivotal role in developing ESL language proficiency, especially in acquiring second and foreign languages like English. ESL students need help comprehending English reading materials due to their limited reading abilities (Al-Jarrah & Ismail, 2018) and insufficient mastery of reading skills (Qarqez & Rashid, 2017). These challenges can impede their progress toward English proficiency (Kiew & Shah, 2020; Lim et al., 2018; Liu et al., 2016; Mansor, 2017). Recognizing these shared challenges and promoting effective reading strategies can empower ESL learners to enhance their language acquisition and overcome obstacles in reading proficiency. In line with this perspective, Tamin and Buyukahuska (2020) highlighted the positive impact of integrating metacognitive strategies into reading lessons to enhance students' reading abilities. Despite the importance of metacognition to reading proficiency (Anderson, 2002; Kamil et al., 2010; Mokhtari & Sheorey, 2002; Mokhtari et al., 2008), little is known about L2 low-achieving students' awareness and use of metacognitive strategies in academic reading contexts. The literature characterizes these students as young children with limited reading skills (Gambrell & Heathington, 1981; Micklos, 1990; Hoskyn & Swanson, 2000). They need to gain the characteristics typically associated with proficient readers, including weak word identification, study skills, reading comprehension, and fluency (Vacca & Vacca, 1999). Consequently, they need help self-regulating and more skills to learn effectively and navigate challenging tasks. By investigating metacognition among low-achieving readers, we can uncover strategies to unlock their potential and support their academic growth.

Metacognition, a vital component of self-regulated learning, is pivotal in students' ability to monitor, control, and gain self-awareness of their learning processes (Zhang and Zhang, 2019; Sun and Zhang, 2022; Teng et al., 2022). It is widely recognized that metacognition, encompassing metacognitive information, experiences, and strategies, significantly impacts the acquisition and development of second languages (Qin and Zhang, 2019; Zhang et al., 2019; Teng and Zhang, 2020; Wu, 2021; Zhang and Zhang, 2022). Acting as a form of self-consciousness, metacognition facilitates optimal control, knowledge, and comprehension of cognitive processes. By engaging in cognitive reflection, metacognition stimulates interest and enables learners to examine their cognitive functions (Sato, 2021). It is essential because understanding cognitive processes empowers students to design and adopt performance-enhancing strategies (Zhang & Teng, 2021). Metacognitive awareness, also known as understanding how one learns in a classroom, is crucial for learners to become more productive and, most importantly, autonomous (Akbarzadeh et al., 2020). The outcomes of this study are to suggest strategies for enhancing the instruction of English reading comprehension as a second language and supporting ESL teachers in improving reading skills.

Moreover, the findings can contribute to understanding diverse teaching practices and how students develop reading approaches. The study also intends to establish a connection between reading difficulties among ESL learners and using metacognitive reading strategies. The research findings will assist in designing academic curricula and guiding programs for lower-performing students in upper elementary grades to enhance their reading comprehension by applying metacognitive reading strategies.

Literature Review

Reading comprehension can be a challenging task for second-language learners of English. Numerous research studies have delved into the factors influencing the reading proficiency and

comprehension of ESL learners, and they have highlighted the significance of metacognitive strategies in enhancing students' reading comprehension (Ahmadian & Pasand, 2017; Al-Jarrah & Ismail, 2018; Alsalihi, 2020; Chen et al., 2016; Kiew & Shah, 2020; Lim et al., 2018; Mansor, 2017; Qrquez & Ab Rashid, 2017; Tamin & Büyükahıska, 2020). These studies have consistently shown a positive correlation between the use of metacognitive methods by readers and their ability to comprehend text in a second language.

Interestingly, most researchers (Grabe, 2002; Mokhtari et al., 2018) have underscored the pivotal role of cognitive process awareness in comprehension. This awareness of one's thinking processes is commonly referred to in the literature as metacognition (Flavell, 1979). Regardless of potential variations in teaching and learning approaches in different countries and cultures, metacognition is essential to the learning process on a global scale. A study on the Program for International Student Assessment (PISA) demonstrates a positive correlation between metacognitive knowledge and reading comprehension across the thirty-four Organizations for Economic Co-operation and Development (OECD) countries analyzed (Ertelt & Schneider, 2015). Thus, students with higher metacognitive knowledge tend to achieve higher reading comprehension scores. Kuhn and Dean (2004) define this concept as "the awareness and management of an individual's thoughts." Similarly, Collins and Smith (2008) have highlighted that these strategies "help students focus their attention on understanding content and making connections between prior knowledge and new information." Various cognitive activities related to L2 learning depend on metacognition, which essentially involves thinking about one's thinking (Flavell, 1979; Zhang, 2018).

Readers' application of metacognitive strategies also depends on their understanding of these strategies that enhance reading comprehension (Soodla et al., 2016; Zhang, 2018). Low performance in reading does not stem from a single factor but instead results from a combination of factors that accumulate over time and impede progress. The literature often describes these individuals as adolescents with limited reading skills (Gambrell & Heathington, 1981; Micklos, 1990; Hoskyn & Swanson, 2000, p. 102), lacking the attributes that differentiate struggling readers, including poor word identification, research skills, comprehension, and fluency (R. et al., 1999). Studies examining the impact of reading proficiency on other skills have shown a correlation between the amount of reading and spelling competence (Stanovich & West, 1989; Polak & Krashen, 1998), as well as a positive association between reading and writing proficiency (Lee & Krashen, 1997).

Numerous ESL students may not have a daily need for spoken English but are obligated to read it to access the wealth of information available in the language, as Eskey (2005) emphasized. Researchers in the field of metacognition have shown that learners' comprehension of the learning process guides and directs their thinking and behavior (Jacobs & Paris, 1987; Zhang & Seepho, 2013).

In practical terms, metacognition theory, when applied to reading, becomes strategic reading. Readers of a second language (L2) often need help with unfamiliar words, grammatical structures, or topics. It is during these moments that reading difficulties surface, prompting L2 readers to consciously assess and explore alternative approaches or sources to overcome comprehension challenges (Phakiti, 2006).

These findings and others indicate that less proficient L2 readers can benefit from metacognitive training programs that promote an understanding of effective metacognitive strategies for enhancing reading comprehension. Introducing them to various effective

metacognitive strategies in L2 academic reading can assist in reducing errors, addressing reading challenges, and deepening their comprehension of L2 academic texts (Roohani, 2017).

Current research on the impact of metacognitive strategies on the reading comprehension of low-achieving L2 students remains limited in the local context. Within studies conducted by Saudi Arabian researchers focusing on enhancing English reading skills, Tausif (2021) emphasizes that "Studying in English poses a significant challenge for students, and a substantial number of them discontinue their education. The authors contend that metacognitive awareness assists students in surmounting this hurdle and promotes academic success. It cultivates self-confidence and encourages lifelong learning. A key finding relevant to this study is that metacognitive reading strategies enhance the reading comprehension of low-achieving ESL readers despite their initial discomfort with metacognitive strategies (Ismaeil & Tawalbeh, 2015).

A substantial body of research on metacognition in L2 reading underscores the positive correlation between readers' metacognitive strategies and their success in L2 reading comprehension. Additionally, language proficiency is linked to readers' development of metacognitive skills (Taraban et al., 2000; Hong-Nam et al., 2014). Therefore, L2 readers must know how to apply reading strategies when planning, regulating, and evaluating their reading processes.

Research Questions

1. How significantly can Metacognitive strategies help low-achieving ESL students improve their reading comprehension skills?
2. How do ESL low-achieving students perceive and respond to the Metacognitive strategy's implementation in their reading comprehension lessons?
3. What is the strength and nature of the correlation between semi-structured interviews and reading comprehension test scores, and how does this correlation vary across different subgroups within the population?

The approach used is described in the section that follows.

Methodology

Participants

This study involved 54 upper elementary ESL female learners and their teachers from a private school in Riyadh City, Saudi Arabia. The students, aged 10 to 12, were native Arabic speakers. To identify low achievers in reading, we used a combination of their GPA and pre-test results, selecting those who scored below the criteria for low achievers.

The students were divided into two groups. The control group consisted of 21 students with varying levels of achievement (low, average, and high) in ESL. They were taught using a traditional reading comprehension method emphasizing grammar, vocabulary, and sentence structure.

The experimental group comprised 33 students with different levels of achievement (low, average, and high) in ESL. They received direct instruction on metacognitive strategies as part of the intervention.

Prior to the intervention, three teachers were chosen for the experimental group. They attended a one-week workshop on using metacognitive strategies, providing approximately six hours of training spread over three days.

Materials

Reading Comprehension Test

The study employed a reading comprehension test designed by the researcher, which consisted of a single passage and various questions to assess students' utilization of metacognitive strategies. This test was divided into two categories. The Pretest was administered before implementing the reading comprehension techniques in both groups to evaluate students' fundamental reading comprehension abilities. The posttest was conducted after the intervention to measure students' reading comprehension differences.

The reading material used in the test was adapted from Grade VI textbooks and online sources, focusing on descriptive genre content. The questions on the test were formulated based on activities and exercises outlined in the training manual.

Semi-structured Interviews

Semi-structured interviews were used in the research to allow participants to express their thoughts about what they were reading. The main goal was to investigate the association between metacognitive reading strategies and students' achievement in reading comprehension after completing the task. Respondents were asked about a text in which they used the strategy during the interviews. The researchers wanted to know if the intervention affected their reading comprehension abilities.

Each student participated in an individual interview with the researcher. They read and analyzed prompts using various metacognitive reading strategies. These interviews typically lasted 5 to 10 minutes, during which students were guided to read a text progressively and respond to comprehension questions that encouraged the use of reading strategies, including prediction, visualization, making connections to their own lives, inferring, and employing fix-up methods to interpret context clues and recognize patterns in the text. The students' responses were recorded as verbatim notes during the interviews and subsequently coded by two educational researchers.

Procedure

This study utilized an experimental research approach, explicitly employing a quasi-experimental design. The study assessed students' reading comprehension of descriptive text using metacognitive strategies through a pretest and post-test design.

Before the intervention, teachers were trained in specific reading strategies, which included a thirty-minute lecture on the metacognitive approach. The students were divided into two groups: the control group and the experimental group. Before the treatment, all students took a pretest to gauge their fundamental reading comprehension abilities. The treatment involved regular reading instruction for the control group, while the experimental group received activities and metacognitive strategies for approximately 6 months.

Teaching English as a Second Language (ESL) reading followed a set of procedures outlined by Moreillon (2007). These procedures included re-reading the text, engaging with prior knowledge, making inferences, visualizing, summarizing what was read in writing, making predictions, and generating new questions.

Following the intervention, a post-test was administered to the students to determine whether there was a significant difference in their reading comprehension scores. The program's effectiveness was assessed by comparing the pretest and post-test scores between the experimental and control groups. Additionally, individual interviews were conducted with the students before and after the intervention, using an evaluation tool prepared by the researcher.

Procedures of Data Collection and Methods of Analysis

Concurrent collection of both quantitative and qualitative data was incorporated in the research. Quantitative data, represented by the Reading Comprehension Test, were gathered before and after a 6-month intervention. During this period, the experimental group received reading lessons incorporating metacognitive strategies (used before, during, and after reading) and customized activities. In contrast, the control group followed the standard approach of using textbooks for their reading lessons. The quantitative data collected underwent analysis, including descriptive and inferential statistical methods.

Qualitative data were acquired through semi-structured interviews, allowing participants to articulate their thoughts and experiences. A coding framework was devised, employing a 5-point scale to evaluate students' responses to the interview questions. This framework facilitated the assessment of the effectiveness of the metacognitive strategies applied by the students, and a consensus was reached on their effectiveness. Eight metacognitive strategies were identified, with the fix-up approach, prediction, and making connections being recognized as the most effective for enhancing text comprehension.

Results

In this research, we undertook a comprehensive study using an experimental design to assess the effects of Metacognitive strategies on the reading comprehension skills of low-achieving ESL students. The study spanned from November 2021 to June 2022, encompassing pre- and post-intervention periods. To assess the effectiveness of the intervention, we employed the Wilcoxon Rank-Sum test as a statistical tool, which allowed us to scrutinize the data collected from both the experimental and control groups.

We aimed to understand how the application of Metacognitive strategies impacted the reading comprehension abilities of the participants. For this purpose, we administered pre- and post-reading comprehension tests and meticulously analyzed the results. As presented in Table 1, our analysis demonstrated intriguing findings. Firstly, in the control group, we observed that only about half of the students displayed improvements in their post-test scores. Even more concerning, nearly one-third of the students in the control group scored lower on the post-test than their initial scores on the pre-test. This indicates a substantial variability in performance within the control group. In contrast, the experimental group exhibited significantly more promising results. All students in this group showcased improvements in their post-test scores, which were noticeable and reached statistical significance. This points to the effectiveness of the Metacognitive strategies in enhancing the reading comprehension skills of low-achieving ESL students.

What's particularly intriguing is that, despite the initial advantage that the control group had at the beginning of the study, the students in the experimental group managed to outperform their counterparts in the control group. This underscores the substantial impact of the Metacognitive strategies, allowing students in the experimental group to catch up and surpass those who initially had a head start. To put this remarkable progress into perspective, it's worth highlighting that, on average, students in the experimental group achieved a significant increase of 20 points in their overall performance. This substantial improvement underlines the transformative effect of Metacognitive strategies on the reading comprehension skills of the low-achieving ESL students involved in this study.

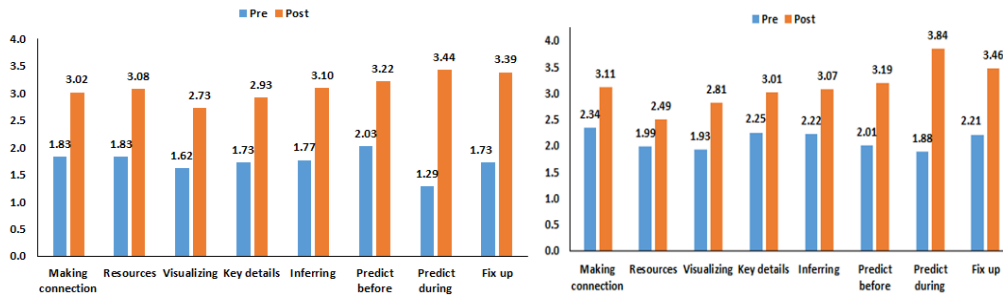
Table 1: Comparing students' grades on pre- and post-reading tests by groups

	Means %		N			Mean Rank		Z	P -value
	Pre test	Post test	Neg. Ranks	Pos. Ranks	Ties	Neg. Ranks	Pos. Ranks		
Cont. group	60.60%	62.00%	6	10	5	9.50	7.90	-0.573	0.567
Exp. group	55.85%	76.60%	1	32	0	1.00	17.50	-5.005	0.000**

For the second question about perceiving and responding to the Metacognitive strategy's implementation in their reading comprehension lessons the results are displayed in Figure 1. The outcomes of our research clearly indicate that all students in the experimental group made substantial progress in their ability to apply the strategies taught during the intervention. Notably, each of the techniques employed by the students exhibited statistical significance at a significance level of $p < 0.01$.

During the interview phase, we gained valuable insights into the range of strategies employed by the students. These strategies included making connections, visualization, predictions, inferencing, using available resources, focusing on key details, and utilizing the fix-up strategy. Initially, the underachieving students demonstrated lower proficiency in utilizing each of these strategies compared to their high-achieving counterparts (as seen by comparing the blue bars in the top and bottom graphs of Figure 1). However, after the instructional intervention, the low-achieving students gradually improved and reached a proficiency level similar to that of the high-achieving students (as indicated by the orange bars in the top and bottom graphs of Figure 1). In some instances, the low-achieving students even surpassed the average scores of the high-achievers.

The results presented in Figure 1 strongly suggest that the strategies taught during the intervention were effective in helping low-achieving students apply reading strategies more effectively. These findings highlight the pivotal role of the intervention in narrowing the proficiency gap in reading strategy utilization between low-achieving students and their high-achieving peers. Furthermore, the students significantly improved their utilization of the less-explored metacognitive strategies, with scores shifting from below average (1.2 to 2.25 on a scale of 5) to above average (ranging from 3.49 to 3.84). While this improvement is evident, it's worth noting that none of the strategies received a high score, defined as above.



Underachieving students

Achieving students

Figure 1: Comparing students' metacognitive strategies in the pre- and post- interviews for the underachieving (first graph) and high-achieving (second graph) students

The inquiry before the intervention centered on the correlation between semi-structured interviews and reading comprehension test scores and how this correlation might differ across various subgroups in the population. Several elements contributed to the assertion of metacognitive strategies' efficacy in enhancing the reading comprehension of underperforming students. This was substantiated by noticeable disparities in students' responses during pre-interviews and post-interviews. In particular, some students exhibited substantial score improvements, advancing from level one on the rubric to levels four and five.

An illustrative example is a student struggling to grasp and interpret the text during the pre-interview. In this case, one student worked to respond coherently to the question, "What is your understanding of the text we have covered so far?" However, after the intervention, there was a noticeable transformation as the student confidently expressed, "Andy, a young boy, hides within a tree while his family enjoys a meal in their backyard." Likewise, a different student faced a question during the pre-interview: "How do you make sense of the text?" At that time, the student couldn't formulate a substantial response. However, there was a significant improvement in the post-interview as the student responded fluently, saying, "I approach the text by re-reading it, which helps me visualize the unfolding events. Additionally, I use self-inquiry to consider the whereabouts of Andy and the other characters."

A clear and remarkable pattern emerges when we carefully analyze the performance of both underachieving and achieving students in both the experimental and control groups during the pre-and post-interviews (see Table 2). Notably, the underachieving students in the experimental group showed the most significant improvement despite starting as the lowest performers. Their mean score in the post-interview assessment impressively reached 3.33. This substantial improvement is supported by rigorous statistical analysis using the Wilcoxon signed-rank test. The analysis yielded a Z value of -3.27 with a p-value of less than 0.05. This indicates that the difference in performance between the pre-and post-interviews among underachieving students in the experimental group is statistically significant. In other words, the improvement in their performance can be attributed to the intervention, specifically the implementation of the fix-up strategy, and is not due to random chance.

What's particularly intriguing is the change in the p-value. Initially, during the pretest, the p-value was above the conventional significance threshold ($p > 0.05$), indicating no statistically significant differences. However, after implementing the fix-up strategy, the p-value decreased significantly. This shift underscores the effectiveness of the fix-up strategy in creating a notable difference between the pre-and post-interviews, ultimately leading to improved performance.

An exciting aspect examines how the fix-up strategy correlates with interview questions and its impact on comprehension outcomes, especially among underachieving students. They demonstrated a correlation coefficient of 0.69, indicating a strong positive relationship between employing the strategy and improved comprehension outcomes. In simpler terms, there's a 70% likelihood that underachieving students benefited more from the strategy in understanding interview questions, which, in turn, contributed to their improved performance.

Table 2: Comparing (UA) underachievers and (A) achieving students' improvement between pre-and post- interviews and reading comprehension tests using the metacognitive strategies by groups

Groups	N	Mean	SD	Z	Sig 2-tailed	correlation
UA-Exp. / pre-int. and pretests	16	1.8	0.46	-0.38	0.69	0.17
UA-Exp./ post-int. and posttests	16	3.33	0.27	-3.27	0.001	0.69
A-Exp./ pre-int. and pretests	17	2.4	0.66	-0.30	0.75	0.34
A-Exp./ post-int. and posttests	17	3.34	0.36	-0.68	0.49	0.43
UA-cont./ pre-int. and pretests	9	2.12	0.42	-0.35	0.72	0.11
UA-cont./ post-int. and posttests	9	2.7	0.48	-1.83	0.06	0.16
A-cont./ pre-int. and pretests	12	2.08	0.35	-2.12	0.03	0.32
A-cont./ post-int. and posttests	12	2.95	0.42	-0.45	0.9	0.37

Conclusion and Discussion

The main objective of this study was to examine the impact of explicitly teaching metacognitive reading strategies to underperform ESL students in KSA on their reading comprehension. The results from reading comprehension tests conducted before and after the training showed a statistically significant improvement in student performance. Both low- and high-performing students demonstrated a substantial 20-point increase in their reading comprehension scores. According to the school's achievement criteria, 10 out of 12 low-achieving students in the experimental group succeeded in reading comprehension by scoring above 50%. Moreover, the students improved their test scores and demonstrated enhanced utilization of the metacognitive reading strategies they were taught, as evident in individual interviews. Particularly noteworthy was that underachieving students in the experimental group improved their application of these strategies to a level on par with that of the high-achieving students.

This study's findings align with existing literature, underscoring the importance of metacognitive reading techniques in enhancing comprehension among second language learners. Numerous studies have consistently shown that metacognition enhances students' reading comprehension abilities. For example, Anderson's (2003), emphasizes that reading development is an ongoing process positively influenced by active engagement in metacognitive processes during reading. Additionally, Gordon and Lu's study (2008) found that students' reading performance improved significantly after instruction on selecting the

most effective reading strategies. Moreover, our data aligns with the results of Gordon and Lu's 2021 study, suggesting that the experimental group continued to benefit from the reading training program well into the follow-up period.

While the study yielded positive results supporting metacognitive reading strategies, a potential limitation stems from its relatively small sample size, which may raise concerns about the findings' generalizability. Nonetheless, it's crucial to highlight that the study's effect size was substantial, measuring 1, and the test's statistical power fell within the recommended range of 0.80 to 1, following Siddharth's guidance (2019). This underscores the adequacy of the sample size and ensures the study's validity. Consequently, though variations in sample size can introduce some bias, they did not significantly impact the study's outcomes.

Given the ongoing endorsement of metacognitive reading strategy instruction as an ongoing process, it is advisable to develop tailored programs to enhance students' reading comprehension performance. This proactive approach should be an integral component of the teaching and learning of reading.

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