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The effect of Metacognitive Awareness of Reading Strategies Instruction on EFL learners' Foreign Language Reading Anxiety

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ABSTRACT

Foreign language reading anxiety is a common issue that can hinder language learning. This study aimed to explore whether teaching metacognitive awareness of reading strategies could reduce foreign language reading anxiety in EFL learners. Fifty-one undergraduate students from a public university in Iran were divided into experimental and control groups. The Foreign Language Reading Anxiety Scale and Metacognitive Awareness of Reading Strategies Inventory were used to assess participants before and after the intervention. Results showed that teaching metacognitive reading strategies significantly reduced reading anxiety and increased metacognitive awareness in the experimental group. The findings suggest that incorporating metacognitive strategies in language instruction can help lower reading anxiety and boost learners' strategy use.

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1. Introduction

Reading is an essential form of communication used for personal, social, and academic reasons. It plays a vital role in the process of second/foreign language learning, as it provides learners with essential input for comprehension (Moradi et al., 2023; Zhou, 2023). It is a fundamental skill on its own while playing a vital role in other language abilities development (Harmer, 2007; Shankar, 2008). These include expanding vocabulary, learning grammar, writing, revising, editing, and utilizing computer-assisted language learning programs (Mikulecky, 2008). In the process of reading, individuals engage in a non-linear approach where they generate hypotheses, test predictions, and utilize their existing knowledge of the world and language to make meaning (Goodman, 1985). While reading, learners experience various stages and undergo psychological processes, including anxiety (Baykal Özalp, 2022; Gordani & Sadeghzadeh, 2023). Such anxiety known as foreign language reading anxiety (FLRA) can lead learners to view reading in a foreign language as a difficult, demanding, and unpleasant task (Gönen, 2015). It can arise from various reasons, including personal factors like the fear of making mistakes, as well as from text-related aspects such as encountering unfamiliar vocabulary, unfamiliar topic, or difficult reading texts. Consequently, learners may experience a sense of discomfort and unease, a decrease in focus and concentration, as well as an increase in distractibility triggered by FLRA (Çapan and Pektas, 2013; Iqbal et al., 2023).

Being an intricate task reading comprehension necessitates the coordination of various strategies. Extensive research has been conducted on reading comprehension strategies, both in general and specifically in second and foreign language contexts. These studies have revealed that readers naturally employ various strategies during the reading process (Brevik, 2019; Okkinga et al., 2023; Urban, 2023; Tercanlioglu, 2004). The terms reading strategies and reading skills are frequently utilized in both classrooms and academic literature, but scholars and researchers in the field recognize that they are different. As Afflerbach et al. (2008) maintain, reading strategies are intentional efforts to manage and alter the reader's decoding of text, understanding of words, and construction of meaning. On the other hand, being automatic practices, reading skills result in efficient deciphering and comprehension, frequently happening without a conscious understanding of the elements or authority implicated. Therefore, strategies

involve conscious control, while skills are automatic. According to Par (2020), although reading skills and reading strategies are distinct, they are connected because practicing and applying reading strategies can improve reading skills.

In an EFL context, individuals utilize multiple reading strategies to comprehend texts. The specific strategies chosen to depend on the reader, who can opt for either cognitive or metacognitive reading strategies as the main approaches (Hasani & Pahamzah, 2022). According to Adler (2001), cognitive strategies are considered the initial objectives for beginners, as they enable individuals to acquire basic reading skills. On the other hand, metacognitive strategies serve as the subsequent phase, allowing individuals to progress towards higher-level goals and values in their reading abilities. Al Melhi (2000) argues that there are disparities between readers who are successful and those who are not with regard to their reading strategies, the extent to which they utilize strategies, their awareness of strategies, and their understanding of what constitutes a proficient reader. Proficient readers usually use both cognitive and metacognitive strategies while reading texts (Sheorey & Mokhtari, 2001). To gain insight into students' reading difficulties, it is essential to examine their metacognitive awareness of reading strategies (MARS). By studying their understanding and use of metacognitive strategies, one can better understand the specific challenges they face in their reading comprehension and identify areas for improvement (Zhang, 2008).

To cope with FLRA and assisting learners in gaining a deeper comprehension of the text, their awareness of implementing effective reading strategies should be developed. Therefore, the present study aims at examining the effects of metacognitive awareness of reading strategies instruction on FLRA.

2. Literature Review

Foreign Language Reading Anxiety

Reading is a purposeful process that involves both top-down and bottom-up approaches to decoding and making meaning from visual stimuli. This process involves various textual factors, such as the content, genre, structure, readability, complexity, and length of the foreign language text, as well as readers' cognitive, metacognitive, and affective

factors. These factors include the ability to comprehend in the first language, knowledge of cultural background, knowledge of the foreign language, level of motivation, self-confidence in one's own abilities, use of strategies, and level of anxiety when reading (Jeon & Yamashita, 2014; Li, 2022). As one of the factors that can impact reading comprehension, there has been a growing interest in investigating reading anxiety (RA) in EFL learners (Sparks & Alamer, 2023). RA can arise from a fear of failure and negative evaluation resulting from perceived inadequacy in reading ability (Edwards et al., 2023).

RA can be a common issue for foreign language learners and may be caused by several factors, including unfamiliar topics, unfamiliar pronunciation, embarrassment when reading aloud, and concern about their level of comprehension. This anxiety can negatively impact learners' ability to comprehend and engage with the text, making it more difficult for them to improve their foreign language reading skills. Therefore, understanding and addressing FLRA is crucial for effective foreign language learning.

According to Çapan and Pektas (2013), FLRA is a distinct form of anxiety referring to the uneasiness, apprehension, or stress that individuals may encounter when reading a text in a foreign language. It is a skill-specific anxiety. As Saito et al. (1999) argue, anxious learners may feel uncomfortable with unfamiliar aspects of the text, such as words, grammar, and cultural background, and may have unrealistic expectations that they should understand everything presented to them. This anxiety can lead to negative emotions and beliefs about reading, which can further impact their reading comprehension and overall foreign language learning experience. Hence, it is crucial to recognize and tackle FLRA to help learners improve their reading skills and reduce negative affective responses. Saito et al. were the first to distinguish RA as a distinct phenomenon from general anxiety experienced in foreign language learning. They introduced the concept of FLRA and created a scale called the Foreign Language Reading Anxiety Scale (FLRAS), to measure it. Their study found a negative correlation between RA and academic performance. It was also revealed that while general foreign language anxiety was not related to any specific target language, various target languages elicited different levels of RA.

Studies by Baghaei et al. (2014), Piccolo et al. (2017), Saito et al. (1999) and Zoghi and Alivandivafa (2014) have all explored the relationship between reading comprehension and FLRA. Hsu (2004) investigated the impact of FLRA on reading comprehension and the underlying causes of this anxiety. Surprisingly, the results showed that FLRA did not have an impact on learners' ability to understand difficult texts. The study identified limited knowledge of English as the leading cause of FLRA rather than the reading passages themselves. Huang (2012) carried out a study to examine the factors contributing to FLRA among Chinese college students. The findings suggested that potential contributing factors could include insufficient background knowledge and psychological issues like fear, anxiety, poor reading habits, as well as disinterest in the foreign language. In a study by Jafarigohar and Behrooznia (2012), a significant negative correlation was found between RA in a foreign language and reading comprehension. Additionally, the study uncovered that female learners reported higher levels of anxiety compared to their male counterparts. Carrying out a meta-analysis, Li (2022) reported a moderate correlation between FLRA and reading performance of learners.

Metacognitive Awareness of Reading Strategies

Being conscious of and actively monitoring the process of comprehension are essential components of proficient reading. There has been a significant effort to comprehend the behaviors of skilled readers while reading, including the employed strategies and the circumstances under which they apply those strategies. This area of study has proven beneficial in teaching inexperienced readers of both first and second languages to enhance their comprehension by utilizing reading strategies (Sheorey & Mokhtari, 2001). According to Auerbach and Paxton (1997), metacognition is the term used to denote this awareness and monitoring of one's own cognitive processes which encompasses the comprehension strategies employed, the capability to supervise understanding, and the proficiency to adjust needed strategies.

Flavell (1979) is credited with coining the word metacognition in the 1970s. The original definition of metacognition described it as the understanding and awareness of cognitive phenomena, but now is generally defined as thinking about thinking or

cognitions about cognition (Çini et al., 2023; Sato, 2023). It provides an explanation of the cognitive processes in humans that involve intentional, goal-oriented, and self-regulated information processing, often referred to as higher order thinking or executive functions (Roebers, 2017). This implies that individuals with high levels of metacognition possess the ability to observe their thoughts and actions with greater clarity and accuracy. Furthermore, they have the capacity to regulate their thoughts, enabling them to select actions that facilitate more effective and efficient progress towards their desired outcomes. Metacognition has been linked to several important learning behaviors, such as problem-solving, inquiry, and seeking help. Learners who possess strong metacognitive abilities are more adept at using their cognitive resources and learning strategies to address challenges compared to those who have weaker metacognition. Similarly, metacognitive learners are more inclined to seek assistance from others, recognizing the benefits of external feedback and support in their learning journey (Sato, 2023). As Flavell (1979) argues, metacognitive knowledge encompasses understanding and awareness about oneself as a person, the task, and the strategies that can be employed to effectively accomplish the task. According to Wenden (1991), person knowledge includes learners' beliefs about themselves and others as cognitive processors. It encompasses their understanding of how learning occurs and the effect of factors like age, aptitude, and learning styles on the process of language acquisition. As she argues, task knowledge pertains to the comprehension of learners regarding the objectives, requirements, and characteristics of learning tasks, as well as the data accessible to them while engaging in cognitive activities. Wenden defines strategy knowledge as effective strategies to accomplish sub goals and goals during cognitive activities. According to Schraw et al. (2006), metacognitive knowledge refers to the understanding of the learning process involved in reading. For instance, academic science journals take longer to read than fiction due to different reading strategies employed. Brown (1987) breaks metacognitive knowledge down into declarative, conditional, and procedural knowledge. Declarative knowledge (know what) is having factual information about a topic, emphasizing the what rather than the how or why. It is a description or attributes of a subject, thing, or event; for example, what paraphrase is as a reading strategy. Procedural knowledge (knowing how) is knowing how to do something, also called imperative, performative, or practical knowledge; for instance,

how to paraphrase. Conditional (strategic) knowledge involves the reasoning for using a specific strategy; as an example, I need to choose to paraphrase to understand and learn from the text better. In a same line, Carrell (1998) defines metacognitive knowledge as knowing what, how and why. Regulation of cognition controls and assesses learning (Sato & Dussuel Lam, 2021). Before reading, individuals engage in a planning activity, during reading they monitor their learning process, and after reading they evaluate and reflect on the strategies used (Anderson, 2008).

Metacognitive strategies involve knowledge of cognitive processes aiming to manage and control one's own learning through using strategies such as setting goals, monitoring progress, evaluating performance, and making adjustments to improve learning outcomes. During the act of reading, metacognitive activities like self-monitoring and self-regulation are employed. These activities involve consciously assessing and controlling both the process and outcome of reading (Baker & Brown, 1984). Metacognitive reading strategies involve actively monitoring comprehension while reading, asking oneself questions like "Do I understand this?" or "What's the main point?" In fact, constant questioning and attention is required (Phakiti, 2003). In a nutshell, metacognitive strategies in reading involve readers' comprehension of the reading process, their capacity to evaluate the cognitive requirements of the task at hand, and their understanding of when and how to utilize particular cognitive reading strategies, taking into account factors like the complexity of the text, situational limitations, and their own cognitive capabilities (Baker & Brown, 1984). Research shows effective ESL/EFL learners are more aware of metacognitive strategies than less skilled readers (Zhang & Wu, 2009). Metacognitive experiences, which are conscious cognitive or emotional experiences, take place prior to, during, and after intellectual activities such as reading. Garner (1988) categorizes pre-reading knowledge as personal strength, during-reading knowledge as strategy, and post-reading knowledge as task. Metacognitive knowledge forms the foundation for these experiences known as awareness.

Metacognitive awareness refers to students' understanding and recognition of their learning strategies, and their ability to effectively use them by knowing when, how, and why to use them (Harrison & Vallin, 2018; Tuononen, 2023). To gain insight into students' reading difficulties, it is essential to examine their MARS. By studying their

understanding and use of metacognitive strategies, one can better understand the specific challenges they face in their reading comprehension and identify areas for improvement (Zhang, 2008). With regard to MARS, Mokhtari and Sheorey (2002) proposed three reading strategies categories: global reading strategies (GLOB), problem solving strategies (PROB), and support reading strategies (SUP). GLOB plan to monitor reading process by previewing, predicting, setting a purpose in mind, and using typographical aids, tables and figures. PROB refer to strategies employed by readers when they encounter challenges in comprehending written material. These techniques include modifying reading pace, making educated guesses about unfamiliar words, and creating mental images to better grasp the content of the text. They are localized and focused. SUP aid readers in understanding text. Examples of SUP include utilizing a dictionary to clarify unfamiliar words, taking notes to summarize important information, and underlining or highlighting key ideas in the text. These strategies help readers comprehend, construct and reconstruct meaning. Their usage varied by age, reading ability, text complexity, reading material type, and so on.

Several exploratory studies including those conducted by Daguay-James and Bulusan (2020), Ghafournia and Afghari (2013), Nazri (2016), Sariçoban and Behjoo (2017), Nguyen and Trinh (2011), Roohani et al. (2017) and Zhan and Seepho (2013) examined the impact of metacognitive awareness of reading strategies on reading comprehension skills. The findings consistently revealed significant positive correlations between various components of MARS and the reading achievement of EFL students. This suggests that as EFL students' awareness of metacognitive strategies increases their reading success also improves.

The literature on the influence of metacognitive instruction on the performance of EFL students is also bolstered by a number of quasi-experimental studies. Habibian (2015) conducted a study examining the effect of metacognitive strategy training on the reading comprehension abilities of ESL learners. In a study by Hadji Seyed Hossein Khani et al. (2023), the effect of metacognitive awareness-raising on EFL students' self-regulation and reading comprehension was examined. The study included a sample of 56 low-intermediate EFL students. The findings revealed that students who were taught integrating flipped classrooms with metacognitive development demonstrated better performance in reading comprehension and self-regulation levels compared to the

control group. The collaborative, entertaining, and educational aspects of the treatment were also well-received by the students. The researchers concluded that the integration of flipped classrooms with the development of metacognition can enhance EFL learners' reading comprehension and self-regulation levels. Shokrpour and Fotovatian's (2009) study aimed to explore how making students more aware of metacognitive strategies can affect their ability to comprehend written materials. The researchers sought to determine whether instructing students on how to consciously use metacognitive strategies during reading tasks would improve their comprehension. The study involved two groups of English language majors who were evaluated using the "Metacognitive Awareness Inventory" developed by Schraw and Denisson in 1994. The aim of the evaluation was to investigate and compare the level of metacognitive strategy awareness between the two groups of participants. Following a pretest-treatment-posttest design over a period of four months, the findings indicated a considerable enhancement in the experimental group's performance who underwent training on consciously employing metacognitive strategies during reading tasks in comparison with the control group.

Based on the above reviewed literature, although research on the impact of metacognitive strategies on reading comprehension and the effect of various factors on FLRA are increasing rapidly, to the modest knowledge of the researchers no study has explored the impact of teaching the awareness and utilization of metacognitive reading strategies on FLRA among the English as a foreign language (EFL) university students in Iran. Therefore, the present study examines the effect of MARS instruction on Iranian EFL university students' FLRA. It also attempts to identify the level of metacognitive awareness and reading strategies use of EFL university students before and after the experiment. The present work is guided by two research questions:

1. Does teaching metacognitive awareness of reading strategies have any significant effect on Iranian EFL university students' foreign language reading anxiety?
2. Is there a significant difference in metacognitive awareness of reading strategies of Iranian EFL students before and after treatment?

3. Method

3.1 Research Design

To determine the effect of metacognitive awareness of reading strategies on the FLRA of undergraduate EFL students, a quasi-experimental pretest-posttest design was utilized. Since two intact classes were selected to participate in the study, convenient sampling strategy was applied.

Participants

The participants of the current research were 51 undergraduate EFL students in a public university in Semnan, Iran and enrolled in two intact classes. The two classes were randomly assigned to the experimental group, consisting of 26 individuals, and the control group, consisting of 25 individuals. The participants included 21 males (41%) and 30 females (59%) aging from 18 to 24. To assess the overall English language proficiency of the participants and ensure their homogeneity, the Oxford Placement Test (OPT) was administered to both groups. The result of independent samples t-test indicated no significant difference in language proficiency of students in both experimental and control groups.

In the experimental group, the lecturer taught the students how to activate their metacognitive awareness of reading strategies, while the traditional method of instruction (i.e. reading the passage, highlighting new vocabularies, and answering comprehension questions and vocabulary activities) was followed in the control group.

Instruments

Oxford Placement Test (OPT)

The Oxford Placement Test (OPT) was utilized to ensure that the students of both groups were homogeneous in their English language proficiency. OPT is a placement test developed by Oxford University Press (2001). The test contains 60 items in two parts: multiple-choice items and cloze passages examining vocabulary, grammar, and

reading comprehension of participants. The first part includes 40 items and the second part comprises 20 items. The participants were given a total of 35 minutes to complete the test.

Foreign Language Reading Anxiety Scale (FLRAS)

The scale developed by Saito, Garza, and Horwitz (1999) was designed to assess the level of FLRA experienced by learners. It includes 20 items in a 5-point Likert scale ranging from 1 to 5 (1=strongly agree, 2=agree, 3=neither agree nor disagree, 4=disagree, 5=strongly disagree). Among the 20 items, 4 items (12, 13, 14 and 18) are negatively worded which were reversed at the time of analysis. Total scores of the RA scale range from 20 to 100 in which a low score shows a high degree of RA. To verify the validity of FLRAS, it was given to three ELT experts. Moreover, to get assured of its reliability, the questionnaire was given to 20 learners in a pilot study. The Cronbach alpha coefficient was .80, which shows a high level of internal consistency.

Metacognitive Awareness of Reading Strategies Inventory (MARSI)

The Metacognitive Awareness of Reading Strategies Inventory (MARSI) is a self-report survey created by Mokhtari and Reichard (2002) to evaluate learners' metacognitive awareness and perceived utilization of reading strategies when engaging with texts, such as academic or school-related materials. The MARSI consists of 30 items that are rated on a five-point Likert-type scale, ranging from 1 to 5. The scale provides response options with 1 representing "I never or almost never do this," 2 representing "I do this only occasionally," 3 representing "I sometimes do this," 4 representing "I usually do this," and 5 representing "I always or almost always do this." The MARSI comprises three reading strategies including global reading strategies (e.g. monitoring comprehension, planning for reading, and evaluating the information), problem solving strategies (e.g. adjusting reading speed, visualizing information), and support reading strategies (e.g. using reference materials, underlining information, taking notes, summarizing, and paraphrasing).

As suggested by Mokhtari and Reichard (2002), the mean ranges of 2.4 or below, 2.5 to 3.4, and 3.5 or above indicate low, medium, and high level of reading strategy use respectively. To assess the validity of the MARSI, the survey was given to three ELT experts. Moreover, to examine the reliability coefficient of MARSI, it was administered to 20 students in a pilot study. The overall reliability coefficient was .83, which indicates a high level of internal consistency.

Data Collection Procedure

To conduct the study, two intact classes were randomly assigned to the experimental and control groups. The research details were thoroughly communicated to the participants, and their consent for voluntary participation in the study was obtained. To ensure the participants' homogeneity in both groups, the OPT were administered at the beginning of the research. The two classes were run by the same lecturer and lasted for 12 sessions. The material used in both classes was a book entitled "Active Skills for Reading 2" written by Neil J. Anderson.

Before starting the experiment, the FLRAS and MARSI were administered to the students of both groups. They were required to complete the surveys in about 20 and 30 minutes respectively. After that, the treatment was started.

In the experimental group in which metacognitive awareness of reading strategies were taught, the students were given a handout each session, which contained one reading strategy. The lecturer taught students how to choose the appropriate strategies and implement them in their reading comprehension tasks. Then, the students were required to self-monitor their awareness and apply those strategies in proper situations. During the experiment, the metacognitive reading strategies contained in the three reading strategies of MARSI (e.g. planning, monitoring comprehension, using reference materials, taking notes, summarizing, questioning, visualizing information, and evaluating the text) were taught to the students.

In the control group, the lecturer followed the traditional method of instruction in which there was no focus on the MARS of students. Each session, the lecturer explained and highlighted the new vocabularies and then asked some students to read the passage.

Finally, the students were required to answer comprehension questions and vocabulary activities.

The last session was devoted to distributing the posttests of FLRAS and MARSI to students of both groups.

Results

To check the normality of the data gathered at pretest and posttest phases, the test of Shapiro-Wilk was conducted. As Table 1 presents, the data were normally distributed ($p>.05$) for both experimental and control groups. Parametric statistical analysis, i.e. independent samples t-test was used to compare the performance of the two groups in terms of FLRA and MARS, allowing for a comparison of their results.

Table 1 *Test of normality*

	Group	Shapiro-Wilk		
		Statistic	df	Sig.
Pretest (FLRA)	Experimental	.96	26	.41
	Control	.91	25	.23
Posttest (FLRA)	Experimental	.93	26	.17
	Control	.97	25	.72
Pretest (MARS)	Experimental	.92	26	.43
	Control	.93	25	.55
Posttest (MARS)	Experimental	.97	26	.66
	Control	.92	25	.41

The descriptive statistics of students' performance in pretest of FLRA are shown in Table 2. As it is obvious from this table, the mean and standard deviation of the

experimental group (M=44.11, SD=2.76) were almost the same as the mean and standard deviation of the control group (M=45.04, SD=3.00). However, an independent-sample t-test was utilized to determine whether the difference between the mean scores of the two groups in pretest was statistically significant or not.

Table 2

Descriptive statistics of pretest of FLRA

	Group	N	Mean	Std. Deviation
Pre-test (FLRA)	Experimental	26	44.11	2.76
	Control	25	45.04	3.00

Table 3 displays the results obtained from the independent samples t-test on the students' scores for pretest of FLRA. The data of Levene's test for equality of variances exhibited that the assumption of equal variances was met (F=0.00, p>.05), so the first row of the Table 3; i.e. "Equal variances assumed" was reported.

Table 3
Independent samples t-test for pretest of FLRA

		Levene's Test for Equality of Variances		t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
									Lower	Upper
Pretest (FLRA)	Equal variances assumed	0.00	.98	-1.14	49	.25	-.92	.80	-2.54	.69
	Equal variances not assumed			-1.14	48.25	.25	-.92	.80	-2.55	.70

As indicated in Table 3, the significance value (2-tailed) was .25, which was greater than the significance level (.05). Therefore, it can be said that there was not statistically significant difference between the performances of the experimental and control groups before the treatment and both groups were almost at the same level in their FLRA at the beginning of the instruction (t(49)= -1.14, p=.25>.05).

The descriptive statistics of learners' performance in posttest of FLRA are displayed in Table 4. As it can be seen in this table, the mean and standard deviation of the experimental group (M=74.88, SD=2.86) were higher than the mean and standard deviation of the control group (M=49.88, SD=2.12).

Table 4

Descriptive statistics of posttest of FLRA

	Group	N	Mean	Std. Deviation
Posttest (FLRA)	Experimental	26	74.88	2.86
	Control	25	49.88	2.12

An independent samples t-test was carried out on the posttest scores of the learners to determine if there was a significant and meaningful difference between the mean scores of the two groups. Table 5 shows the results of the independent samples t-test for posttest of FLRA.

Table 5

Independent samples t-test for post-test of FLRA

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Posttest (FLRA)	Equal variances assumed	2.42	.12	35.30	49	.00	25.00	.70	23.58	26.42
	Equal variances not assumed			35.50	46.13	.00	25.00	.70	23.58	26.42

It can be seen from the data in Table 5 that the result of the Levene's test for equality of variances did not violate the assumption of equal variances (F=2.42, p>.05) and that is why the first row of Table 5 was reported.

As shown in Table 5, the significance value (2-tailed) for equal variances was found to be .00, which is lower than the required cut-off of .05. This suggests a statistically significant difference in FLRA performance between the experimental and control groups following the treatment (t(49)=35.30, p=.00<.05). The mean difference (25.00) and the meaningfulness of the difference between the groups revealed that the experimental group, who received instruction through MARS, demonstrated better performance compared to the control group, who did not receive the same treatment.

Table 6 shows the results of the descriptive statistics for the two groups on the pretest of MARS. The results indicated that the experimental group had a mean score of 2.61 with a standard deviation of 0.04, while the control group had a mean score of 2.63 with a standard deviation of 0.05. These statistics indicated that the mean scores of the experimental and control groups were relatively similar on the MARS pretest. Based on the assessment guideline proposed by Mokhtari and Reichard (2002), the mean ranges of 2.5 to 3.4 shows a medium level of reading strategy use. However, to ensure that there was no significant difference in the mean scores of participants in both groups at the beginning of the experiment, an independent samples t-test was conducted.

Table 6

Descriptive statistics of pre-test of MARS

	Group	N	Mean	Std. Deviation
Pre-test (MARS)	Experimental	26	2.61	0.04
	Control	25	2.63	0.05

The results of the independent samples t-test are shown in Table 7. The Levene's test results (F=0.57, p>.05) indicated that there was no significant variation between the variances of the two groups in terms of MARS pretest. Therefore, the first row of Table 7, labeled "Equal variances assumed", was reported.

Table 7

Independent samples t-test for pretest of MARS

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Pretest (MARS)	Equal variances assumed	0.57	.48	-.44	49	.67	-.01	.03	-.11	.08
	Equal variances not assumed			-.42	48.10	.69	-.01	.03	-.13	.09

According to the information presented in Table 7, there was no statistically significant difference observed in the mean scores of the two groups on the MARS pretest (t(49)=-.44, p=.67>.05). Therefore, it can be concluded that the two groups were homogenous in terms of MARS before the treatment.

The descriptive statistics for the posttest of MARS are presented in Table 8. The findings revealed that the experimental group (M=3.73, SD=0.07) had a higher mean score compared to the control group (M=2.80, SD=0.08) on the posttest of MARS. According to the assessment guideline suggested by Mokhtari and Reichard (2002), the mean ranges of 3.5 or higher indicates a high level of reading strategy use. Therefore, the experimental group revealed a high level of metacognitive awareness and strategy use after the treatment.

Table 8

Descriptive statistics of posttest of MARS

	Group	N	Mean	Std. Deviation
Posttest (MARS)	Experimental	26	3.73	0.07
	Control	25	2.80	0.08

The Levene's test results (F=.30, p=.60) revealed that there was no significant difference between the variances of the two groups (see Table 9). This indicates that the assumption of homogeneity of variances was satisfied.

Table 9
Independent samples t-test for post-test of MARS

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Post-test (MARS)	Equal variances assumed	0.30	.60	15.49	49	.00	.93	.06	.77	1.08
	Equal variances not assumed			14.96	47.95	.00	.93	.06	.75	1.10

From the table above we can see that the results of the independent samples t-test ($t(49)=15.49$, $p=.00<.05$) demonstrated that the experimental group outperformed the control group on the posttest of MARS.

Discussion

This research aimed at determining the effect of MARS instruction on EFL students' FLRA. Moreover, the study attempted to identify the level of metacognitive awareness and reading strategies use of EFL university students before and after the experiment. The most significant finding in this study was the positive effect of MARS on alleviating FLRA of the EFL students. With respect to the second research question, it was found that the students of the experimental group revealed high level of metacognitive awareness and strategies use at the end of the study.

In accordance with the present results, previous studies (Fathi & Shirazizadeh, 2020; Iqbal et al., 2023; Marashi & Rahmati, 2017; Valizadeh, 2021) have demonstrated that teaching reading strategies could decrease the FLRA among learners. Marashi and Rahmati (2017) reported that teaching six comprehension strategies (i.e., predicting, visualizing, questioning, making connections, monitoring, and summarizing) to intermediate EFL learners significantly lowered their RA. Moreover, the finding of the present research is consistent with that of Valizadeh (2021) who found that teaching reading comprehension strategies (i.e., previewing, skimming, scanning, recognizing the main idea, utilizing context clues, making inferences, making predictions, and

summarizing) reduced the RA of low-intermediate EFL learners. However, it should be mentioned that none of the above-mentioned studies investigated the effect of teaching MARS (i.e. global reading strategies, problem solving strategies, and support reading strategies) on FLRA of the EFL students. Furthermore, the level of metacognitive awareness and strategies use of students after implementing the experiment was not measured by the aforementioned studies.

Several authors have explored the relationships between metacognitive awareness of reading strategies and reading proficiency (Hong-Nam, 2014), reading comprehension (Fitrisia et al., 2015; Mortazavizadeh et al., 2022; Sasani et al., 2018), and academic attainment (Sheikh et al., 2019). In their studies, the researchers highlighted the importance of metacognitive awareness of reading strategies in the foreign language context. According to Lien (2011), when learners have trouble understanding what they read, they can feel really frustrated and may not want to learn more. Therefore, to help learners reduce their RA and monitor their own learning, English language teachers may need to focus on teaching metacognitive awareness of reading strategies in classes. Tsai and Lee (2018) reported a negative correlation between FLRA and reading strategy use of EFL learners in which the learners who employed more reading strategies experienced lower FLRA.

Conclusion

The results of the present study revealed that teaching MARS had a significant effect on reducing FLRA of EFL students. Furthermore, students of the experimental group indicated high level of metacognitive awareness and strategies use after the treatment. The current findings highlight the importance of incorporating teaching MARS within the pedagogical curriculum to assist students lessen their FLRA.

The findings of this investigation complement those of earlier studies, which focused on the significance of reading strategies instruction in classrooms (Hadji Seyed Hossein Khani et al., 2023; Khellab et al., 2022; Togatorop & Vista, 2018) and its effect on decreasing RA of students (Fathi & Shirazizadeh, 2020; Valizadeh, 2021). Metacognitive awareness of reading strategies will make learners feel more certain and

give them a better understanding of each reading they do. In order to accomplish this, educators must instruct their students on the application of global, problem-solving, and support strategies when engaging with written texts. However, the EFL instructors themselves need to be trained how to teach strategies efficiently. According to Grabe (2009), effective reading strategies instruction by instructors includes "consistent modeling, scaffolding, extensive practice, and eventually independent use of strategies by students" (p. 240). To familiarize the instructors with such strategies, professional development programs should be held. Material developers and EFL textbook writers could also provide reading texts including exercises and tasks to make learners familiar with these strategies. Knowing these strategies can help learners to control their anxiety, analyze the reading passages critically, and consequently develop their reading comprehension.

Additional investigations are required to be conducted to investigate the impact of teaching MARS on reading comprehension, reading self-efficacy and academic performance of the learners. Considerably more work will need to be done to determine what types of metacognitive reading strategies (i.e., global reading strategies, problem solving strategies, and support reading strategies) are more effective in reducing FLRA of the students. Further research is needed to investigate the factors contributing to FLRA among the EFL learners.

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