



The Effectiveness of Metacognitive Awareness Raising on Reading Comprehension and Self-regulation of Iranian EFL Learners

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ABSTRACT

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The importance of the metacognitive awareness raising strategy has been well-documented in research findings as a type of support for the language skills acquisition of English as a foreign language (EFL) learner in overall; nevertheless, the efficacy of this strategy on EFL learners' reading comprehension and self-regulation level has received little notice. This research investigated the effectiveness of metacognitive awareness raising in a flipped educational environment on Iranian EFL learners' reading skills and their self-regulation levels as a partial attempt in this direction. In order to do this, a sample of 56 low-intermediate EFL students from one of the private language schools in Kerman, Iran, were chosen for the study relying on a convenient sampling strategy. The Oxford placement test, a reading pre-test, a reading post-test, a self-regulation scale, and a semi-structured interview were used to gather the results. Independent samples t-test findings indicated that from the pre-test to the post-test, EFL students in the treatment group outperformed the control group in both reading comprehension and self-regulation level. The findings of the semi-structured interview supported those of the t-test, and it was determined that the treatment's collaborative, entertaining, and educational elements had impressed the students. In sum, the results confirmed that integrating flipped classrooms with metacognitive development increased EFL learners' reading comprehension and self-regulation levels. The pedagogical implications of the strategy are discussed.

Keywords: Metacognitive Awareness Raising, Flipped Classroom, Self-regulation, Strategy-based Instruction

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1. Introduction

Individual characteristics can have a significant impact on second language learners' behavior during the second language acquisition process, according to research on learning foreign or second languages (Dörnyei, 2009; Dörnyei & Ryan, 2015), however the role of strategy instruction on improving English skills and personality related traits cannot be ignored. Among language skills, reading skill seems to be a cumbersome task as it needs the readers to decode the information existed on the texts (Gómez González, 2017). Understanding is the main goal of reading skill, which is constantly difficult, especially for EFL learners (Tercanlioglu & Demiröz, 2015). For many second language learners in all educational settings, reading becomes a viable strategy to build abilities in environments where input sources are constrained. Reading can also help or hinder academic advancement (Gorsuch & Taguchi, 2010). Härmälä and Barkhanajyan (2018) assert that many EFL readers struggle to comprehend what they read, particularly in academic literature. Additionally, even though academic second language readers have the necessary language skills, they may struggle to fully comprehend the academic topics (Sahmadan & Ajam, 2020). It seems that second language learners lack the necessary metacognitive strategies to successfully manage their reading. Additionally, it is argued that how someone manages and monitors the L2 learning process impacts and may even determine how well they learn a language (Chamot, 2014).

Metacognition, also known as “metacognitive awareness,” is the knowledge and monitoring of the learning process and it is a crucial factor of effective language learning (Öz, 2007). A large body of research has now shown that metacognitive awareness, the capacity to govern and regulate one's self-controlled mechanisms and cognition can play a substantial role in English acquisition (Mehri Ghahfarokhi & Tavakoli, 2020; Roohani et al., 2017; Wallace, 2022). In other words, metacognitive awareness seems to impact EFL learners' self-regulation while reading passages by improving an individual's analytical approaches (Al-Jarrah et al., 2018). The idea of self-regulated learning is founded on the idea that learners should be in responsible of their own education and should participate in it in an active manner (Zimmerman, 2002).

Furthermore, the metacognitive awareness raising of EFL/ESL students might be impacted by the teaching setting (Shyr & Chen, 2018). The flipped classroom, in contrast to other classroom settings, is observed to have an effect on metacognition (Limueco & Prudente, 2019; Shih & Huang, 2020). The flipped classroom is “the blend or mixture of any two instructional technologies” (Caner, 2012, p. 24). It differs from the traditional classroom in

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one key way: students here have access to learning materials outside of class and use that time to engage in peer discussions, knowledge application, or hands-on tasks (van Vliet et al., 2015).

As an alternative teaching approach, the flipped classroom is said to affect how students view learning since learners are required to participate in in-class as well as in pre-class/ post-class activities in an active manner (Trigwell et al., 1999). Shih and Huang (2019) contend that when learners have greater control over their learning in the context except the classroom, they also have more opportunity to successfully participate in education. Similarly, various research has attempted to explore the beneficial integration between pupils' use of metacognitive strategies and flipped classroom instruction (Cornford, 2002; Shih & Huang, 2019) that is regarded as a necessary skill for students to become active students (Carneiro, 2007; Fleming & Panizzon, 2010; van Vliet et al., 2015).

According to research, students who struggle with reading comprehension have trouble executing a variety of tasks (Ghorbani Shemshadsara et al., 2022). The failure of students to select abstract words in semantic judgment and recall tasks, the complexity of producing semantic category members, which is crucial in verbal fluency tasks, and the students' poor performance in tasks that involve evaluating their lexical knowledge are a few of the problems noted by various scholars and researchers (Ricketts et al., 2007). For these considerations, it is thought that mastering reading comprehension is a challenging and hard endeavor (Floris & Divina, 2015). By the end of the 21th century, researchers and theorists were in basic consensus that metacognitive strategies have enough adaptability and vitality to be consistent with the dominant idea of self-regulation (Griffiths, 2019), but their actual impact on low-intermediate EFL learners has not been investigated.

Hence, the present study tried to find out the impact of employment strategy-based teaching through metacognitive raising on the reading skill and self-regulation of EFL learners who are trained and instructed in the flipped language learning context. Furthermore, investigating the attitudes of the learners who experienced this type of instruction towards reading comprehension and self-regulation, was the other objective of this study.

2. Literature Review

Procedural, declarative, conditional awareness, or learning about things, how to do things, why things are done in a certain way, and having the option to do something, are all parts of knowledge of cognition, which is what people are aware of in terms of their mental functioning (Sugiharto et al., 2018). Flavell sees metacognition as "knowledge and cognition about cognitive phenomena" (1979, p. 906). Since participants in the flipped classroom are expected to actively participate in both in-class and pre- and/or post-class activities, it is believed that this alternative teaching strategy will

change how students view learning. Metacognitive awareness is knowing how you learn in an ELT classroom. Increasing learners' effectiveness and, more critically, their autonomy requires them to develop metacognitive awareness (Akbarzadeh et al., 2020).

A growing corpus of research on teaching foreign languages suggests that in order to manage the use of particular strategies during reading activities, students need to be aware of how and what reading strategies are utilized (Tamin & Büyukahska, 2020). A skilled reader can utilize any method in their arsenal to determine a text's meaning (Klapwijk, 2015; Manoli, 2020; Par, 2020). As Karbalaei (2011) aptly put it, metacognitive reading strategies are major tools students consciously choose for a particular task when managing, organizing, controlling their reading processes, and evaluating the effectiveness of their strategy use. Advanced metacognitive readers are accountable for their thinking patterns, take ownership of their reading strategies, and successfully employ them. They are conscious of their cognitive processes, in addition to what they know and do not know (Azizoğlu & Okur, 2020).

In addition, integrating strategy and technology might affect the acquisition of second languages (Day, 2018). One type of blended learning that combines two educational tools is the flipped classroom (Chiang, 2017). Flipped approaches to university education and instruction have historically aimed to increase learners' participation, improve the learning environment, and finally improve students' success (Bossae et al., 2016; Caner, 2012; Zhou & Wei, 2018). The primary argument for flipped classroom practices is to promote experiential learning and engaged knowledge development (Awidi & Paynter, 2018).

Past surveys on metacognitive awareness have demonstrated that this method has a considerable impact on various parts of the English learning process and academic accomplishment (Batang, 2015; Maftoon et al., 2014; Öz, 2007; Sun, 2013). In a flipped classroom, for instance, Yilmaz and Baydas (2017) looked at learners' understanding levels of metacognition, the metacognitive methods students employ to learn, and their learning success in activities that were held before class. According to post hoc findings, there was no correlation between academic achievement during the first three weeks and metacognitive technique. The outcomes of the fourth and fifth weeks, though, were different from those of the first three. Yet, when learners are aware of their learning processes and employ them to structure, plan, and evaluate their learning, they become more independent and self-sufficient (Çakici, 2015; Lazăr, 2013).

Furthermore, integration of metacognition and self-regulation has been focused on some studies, for instance, in their 2010 study, Lee et al. sought to determine how generative learning strategy prompts as the first scaffolding

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technique and metacognitive feedback, as the second one, affected students' understanding and self-control as they enrolled in a computer-based learning environment. A framework that clarifies mediating processes among variables that was conceptualized and empirically tested using structural equation modeling. As a result of greater self-regulation and successful employment of generative learning strategies such as highlighting and summarizing, the combination of generative learning strategy prompts and feedback in the form of metacognition improved learners' recall and understanding. Additionally, Mevarech et al. (2017) demonstrated that in primary mathematics, interventions that included the progress of motivation, metacognition, and cognition had remarkable results than those that concentrated primarily on motivation or on a combination of cognition and metacognition. In order to outline and test the causal linkages among three different metacognitive reading strategy types— problem-solving, global, and support strategies—as well as self-regulation in relation to reading comprehension, Amini, et al. (2020) used SEM. The results have potential significance for the completing roles of self-regulatory activities and metacognitive in reading performance as well as additional conceptual evidence for self-regulated action models that are dynamic.

In the area of technology-enhanced classrooms, Zhang et al. (2019) investigated the impact of using rubrics that can be used in flipped classrooms on learners' metacognitive awareness and learning achievement. In addition, the variable of cognitive load was focused. According to the findings, using rubrics can help with flipped context by raising learners' levels of learning performance and metacognitive awareness whereas lowering their cognitive load. In contrast to a traditional classroom setting, Shih and Huang (2020) used a qualitative approach to compare how EFL students developed metacognitive awareness and used metacognitive strategies in a classroom that is flipped-based. The results demonstrated students' metacognitive knowledge had experienced a significant shift in a flipped classroom setting. Similarly, the flipped classroom model promoted a broader, more engaged use of metacognitive techniques. Kansızoğlu and Cömert (2021) sought to ascertain the impact of the flipped classroom paradigm on writing achievement and metacognitive writing awareness. The survey's findings demonstrated that the participants in the flipped context model-based teaching group had statistically high significant metacognitive writing awareness and story writing proficiency levels than those in the conventional face-to-face teaching group. Jiang (2022) recently looked into the metacognitive technique utilization and affecting aspects of Chinese English majors in a flipped setting. The findings revealed that the metacognitive strategies that learners used in and outside the flipped classroom are different from planning, directed attention to selective attention. Moreover, the findings indicated that favorite learning outcomes and collaborative learning were the elements affecting pupils' metacognitive

strategy use. Finally, learners' self-control on the learning in the flipped setting also encouraged students' employment of various metacognitive strategies.

Recent growth in educational interventions aimed at enhancing learners' metacognitive skills and knowledge is not unusual (White & Frederiksen, 2000). As far as we know, numerous research has been done on self-regulation, flipped classrooms, and metacognition in different teaching contexts, including EFL and ESL. However, to be optimistic, there seemed to be few studies specifying the role of metacognitive awareness raising strategy in flipped instructional environments on EFL learners' reading skill and self-regulation levels as well as the learners' attitudes towards the metacognitive awareness raising strategy in an EFL context like Iran. Hence, this research was an effort to bridge this gap. For this reason, the following null hypotheses were formulated:

H01: Implementing metacognitive awareness raising in flipped teaching environment does not have any meaningful effect on EFL learners' reading comprehension.

H02: Implementing metacognitive awareness raising in flipped teaching environment does not have any statistically significant effect on EFL learners' self-regulation.

3. Method

3.1. Participants

The research's design employed a mixed-method approach because it collected data both quantitatively (via pre- and post-tests on reading comprehension and self-control) and qualitatively (through interview). Pre-intermediate EFL students at one of the private language schools in Kerman, an Iranian city in the southeast, made up the study population. The male and female learners ranged in age from 15 to 20. In accordance to the institute's learner profiles, all of the students were regarded as per-intermediate level students. The sample was composed of 56 subjects, 28 in the experimental group (EG) and 28 in the control group (CG) in the flipped context classroom. The sampling method was convenience sampling since lower-level EFL learners were the available participants to the researchers.

3.2. Materials and Instruments

The materials for the current research were the Top Notch 2 A published by Longman publications in 2006 was used. Various data collection tools were employed to acquire the study's data, including the Oxford placement test (OPT) to homogenize the students' level of general English, pre-test and post-test in reading comprehension and self-regulation, and a semi-structured interview. The test included 60 questions on different skills and sub-skills. The test examined whether the learners were homogeneous regarding their language proficiency. The OPT test's content and face validity were endorsed by three experienced EFL teachers from the same institute.

In order to assess the learners' reading comprehension, reading part of Preliminary English Test (PET) was used comprising 35 items so that to explore learners' performance in reading comprehension before and after the treatment. The scores' range was between 0 to 35. The researchers administrated the test and after piloting the test. The results revealed that the reading test enjoyed a reliability of .76. The reading pretest of PET was administered one week before the treatment to determine the existence of any difference on reading skill level before the treatment. Considering the important role of validity, since the test was standard, there was no need to validate it. It is worth noting that the same test of PET used in the pre-test of reading was utilized as the post-test due to comparability. To assess the learners' reading comprehension, the researchers administrated the test after piloting the test. Considering the important role of validity, since the test was standard, there was no need to validate it. It is worth stating that the same test of PET utilized in the pre-test of reading was utilized as the post-test due to comparability.

In addition to the instruments listed above for obtaining data, the other tool was a self-regulation scale created by Brown et al. (1999) (a 63-item scale). The participants responded to the questions by selecting one of five options with a Likert scale from strongly disagree to strongly agree. Scores greater than 239 denote high (intact) SR capacity, scores between 214 and 238 denote intermediate (moderate) SR capacity, and scores below 213 denote poor (impaired) SR capacity. Utilizing Cronbach's alpha, the dependability of the SRQ was assessed to be 0.81. Besides the above-mentioned data gathering tools, a semi-structured interview was employed at the end of the treatment to explore the participants' perspectives toward the employment of the strategy on English reading comprehension and self-regulation. It is worth noting that the results of the interview were analyzed based on Schmidt's (2004) analytical method of qualitative data that is elaborated below in the procedure section.

3.3. Procedure

At the beginning of the research and following a general ethics code for research, the Academic Affairs of the language department of Kerman University approved the consensus forms to start the research. Thus, the learners were informed about the research's goals and that their answers would remain confidential. It was crucial to ensure that both the research institution and the participants understood their right to anonymity. The students were needed to write their names on the tests during project implementation. For the aim of ethicality, the learners' names were kept anonymous.

In the first phase and two weeks before the onset of the treatment, to approve the EFL learners' heterogeneity or homogeneity based on language proficiency, OPT was run for 70 students. After analyzing the proficiency test results, 14 students were excluded from the process of the research due to their high/low scores on the test and the criterion for the inclusion and exclusion that was one SD below and above the mean.

The remaining learners in the intact classes amounting to 56 students, continued the study. After this phase, the reading comprehension test along with SR questionnaire were administered to the learners in both groups one week before the study, and the allotted time was 60 minutes. After these phases, the treatment was started. According to the goal of this research, metacognitive reading strategies developed by Chamot and O'Malley's (1994) model were used.

The techniques included figuring out unknown words from context cues, summarizing key points from a document, searching for particular informational components and concentrating on those components, and ultimately determining whether the reading objectives have been met. The researcher served as the class instructor during 16 sessions, going through each strategy with the students one at a time. The aforementioned tactics are meant to raise students' awareness of what tactics are and which ones they already employ. In order for learner self-regulation to be seen as the final objective of the strategy training, the instructor modeling was gradually reduced over time to ensure that the students began applying these methods on their own. In the second stage, methods were also applied to additional texts and self-evaluation of the techniques' efficacy was conducted. Following practice, learners assessed how well they had used their strategy. The assessment phase, which concluded the process, evaluated the students' usage of techniques and how those strategies affected performance. These stages took a lot of time, but based on the researcher's (the group's instructor) direct observation of the real procedures in the classroom, the groups were eager to take part in and completing the tasks step-by-step. It is important to

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remember that the operations and treatment took place in a reversed setting. The flipped context was employed for both pre- and in-class tasks.

Besides, employing metacognitive strategies is critical in activities are done before the class. Also, in-class activities were as important as the pre-class activities. The learners were required to write and take notes about the strategies they used in the pre-class activities. This task motivated and encouraged them to involve the learners in the treatment process. For in-class activities, the teacher interviewed one or two students in each group after each lesson asking probing questions as follows: What is today's strategy? What do you understand from that strategy? Do you think this strategy is essential? Is it difficult or easy to use while reading? Have you ever used this strategy before? Do you like that strategy? Why? Why not? Do you consider using this strategy from now on?

The learners in the CG were instructed reading comprehension tasks without implementing metacognitive strategies. Word and dialogue memorization, topic discussion, reading, and writing activities were done at home and were checked by the teacher where the activities were used except using reading texts. The activities were limited to methods that were mostly teacher-centered and controlled by the teacher. It is worth noting that the procedure for the control group was done in the flipped context.

The study was administered during 16 sessions, one session for homogeneity, one session for pretest in reading and SR, the other for posttests, and three sessions for semi-structured interview, and finally 10 sessions for the treatment. It seems that a 10-session treatment (each session 70 minutes) was enough for ensuring the memory effect between pretest and posttest. The instructor was the same for both groups, but the difference lay in the material selection, teaching procedures, and strategies. The identical exams were used as post-tests following treatment, and learners in EG were exposed to the interview stage. For the sake of accurate transcription and in-depth analysis, the interview was recorded. After data collection, the scores of the two groups based on their scores in post-tests were contrasted via independent samples t-tests to response the first research question. At the next phase, the interview findings were reported, and the positive and negative points of the strategy under study were reported based on the point of views of the students in the treatment group to response the last research question.

Finally, a semi-structured interview was run to examine the participants' attitudes in the group that outperformed the other group to reflect on their overall perception of the instruction, such as whether they liked the class and recommended it to others. They were also needed to give justifications for their responses. Besides, the learners were required to share their ideas about the strengths and weaknesses of the instruction on improving the reading texts and self-regulation level.

One-on-one interviews was conducted with each student in the group that outperformed the other group in reading comprehension and SR while recording their voices for further analysis and presentation. The interviewees provided their responses in Farsi, which were translated into English and presented as part of the study's qualitative data. It is worth notifying that the validity of the interviews was checked by the three professors in Applied Linguistics from Kerman Azad University. However, in order to ascertain the reliability of the interpretations, the comments of two raters (one TEFL professor, one PhD holder) in 10 transcripts were sought to make sure that inter-rater agreement was met. Moreover, for increasing the reliability and validity of the data, a Persian equivalent of the mentioned instruments was used for collecting the information. For the aim of dependability, 30% of the interview results were re-checked by two of the researcher's colleagues who were familiar with the data analysis section, and the inter-rater reliability results were reported to be .90.

4. Results and Discussion

4.1. Results

As mentioned, before the onset of the research, a reading comprehension pretest was administrated to the groups. The results of descriptive statistics of the pretest in reading comprehension are represented in Table 1.

Table 1

Descriptive Statistics of Pre-test in Reading Comprehension

	N	Minimum	Maximum	Mean	Std. Dev.
CG	28	11.00	17.00	15.39	1.57
EG	28	12.00	17.00	16.22	1.64

Table 1 indicates that the means of the treatment group in pre-test ($M=16.22$, $SD=1.6$) and control ($M=15.39$, $SD=1.5$) group are to some extent the same. The highest score was 17 out of 35 in both groups compared with the lowest one, 11 in the control group. After the experiment in the form of metacognitive awareness raising strategy, a posttest in reading comprehension was used (Table 2).

Table 2.

Descriptive Statistics of Posttest in Reading Test

	N	Min	Max	Mean	Std. Dev.
CG	28	20.00	26.00	21.70	1.66
EG	28	21.00	33.00	25.60	1.63

Based on the results obtained from Table 2, the mean of the learners in the EG (M=25.6, SD=1.6) is more than that of the CG (M=21.7, SD=1.6), however the significance of the means needed to be reported statistically through an independent samples t-test. One of the assumptions for running t-tests is that the scores should be normally distributed. Since the Sig. values are higher than the significance level (.05), it can be said that the reading test's data were normally distributed. A t-test was performed to determine if there was a distinction between the two groups. The findings are presented in Table 3.

Table 3.
Results of Independent Samples T-Test in Reading Comprehension

	<i>F</i>	<i>Sig.</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Equal variances assumed	2.279	.130	1.9	28	.043
Equal variances not assumed			2.2	28	.025

According to Table 3, Levene's test of the equality of variances is $F=2.27$ with a significant level of .130. The results also represent the t-test value of 1.9 to manifest the equality of means with a significant level of .043. As for the equal variances, the results show that the significant level of .043 is less than 0.05. Therefore, the null hypothesis stating that there is no distinction between EG and CG is rejected. Hence, it can be claimed that the first null hypothesis rejected at p value less than 0.05 and it was shown that metacognitive awareness raising strategy in flipped teaching environment was effective in improving lower-level EFL learners' reading comprehension.

The second null hypothesis intended to test the effectiveness of metacognitive awareness raising on the self-regulation of EFL learners. To this end, two administrations of the self-regulation questionnaire were compared. Table 4 shows the descriptive statistics of the learners on the pretest of self-regulation prior to the main study.

Table 4.
Descriptive Statistics of Pre-test in Self-regulation

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pretest of SR	EG	28	201.20	4.231	.792
	CG	28	199.27	4.547	.831

Table 4 indicates that in terms of SR, the mean of EG (M=201, SD=4.2) and CG (M=199, SD=4.5) are similar to each other. It can be claimed that the experimental and control groups have fairly close means on the pretest of SR. After the treatment, a posttest in SR was used (Table 5).

Table 5.*Descriptive Statistics of Posttest in Self-regulation*

	Group	N	Mean	Std. Deviation	Std. Error Mean
Posttest of SR	EG	28	243.11	4.27	.5921
	CG	28	214.52	3.92	.6235

According to Table 5, the experimental group' post-SR mean (M=243, SD=4.2) is greater than the control group's (M=214, SD=3.9), but an independent samples t-test was required to maintain the statistical significance of the means. The idea that the data should be regularly distributed is one of the presumptions for doing t-tests. It can be concluded that the data was normally distributed in SR based on the findings of the normality analysis because the Sig values are higher than the significance level (.05). A T-test was conducted to determine if there was a distinction between the two groups. Table 6 presents the findings of an independent sample t-test.

The results showed that the self-regulation scores for the EG (M=243, SD=4.2) and CG (M=214, SD=3.9) participants significantly differed ($t(58) = 2.744$, $p = .008$, two-tailed). The size of the mean difference (eta squared = .123) was significant (mean difference = 19.6, 95% CI: 4.135 to 24.64). Thus, the second null-hypothesis that claimed "Implementing metacognitive awareness raising in flipped teaching environment does not have any statistically significant effect on EFL learners' self-regulation" was rejected.

Table 6.*Results of Independent Samples T-Test in Self-regulation*

	F	Sig.	t	df	Mean Diff.
Equal variances assumed	0.62	.811	2.744	58	19.600

The other stage of the research was to find out the attitudes of the learners in the metacognitive awareness raising strategy as the group that outperformed control group in both reading comprehension and self-regulation on L2 achievement. The first question of the interview was to discover the learners' point of views on the plus points of the strategy. According to the interview results, most of the students in the EG group preferred this type of instruction in the flipped classroom to the traditional classroom (26 out of 28 students). They suggested that the strategy can be used in other English-related courses. The students expressed their points of view in the sentences. For instance, one of the students pointed out to the role

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of group work in controlling the students' stress as a result of assistance from the peers and stated that:

Extract 1: *Group work was noticeable among the students, and it helped everybody to adapt my stress and get help from friends.*

The other student mentioned to the role of group work:

Extract 2: *I was not afraid of my shortcomings or misunderstanding since the group ignored my problems.*

The other plus point of the strategy, besides the dependency on peers, was teacher's collaboration, as expressed in Extract 3.

Extract 3: *The teacher was very collaborative, although I depended on my classmates more than the teacher.*

Moreover, the fun nature of flipped setting integrated with the strategy was the other merit.

Extract 4: *The flipped context that I did not experience so far was amazing and motivating since I received materials before the class and could study them.*

Extract 5: *Active participation and happiness in the class context increased my motivation and decreased my anxiety level.*

The different context of the class as well as the ignorance of errors and detailed instruction on reading strategies were of three key terms that one of the motivated participants mentioned as advantages of the strategy.

Extract 6: *The teaching procedures were both new and different from what we had learned before since some unimportant errors were ignored and the class time was spent to detailed instruction of reading strategies.*

The second question of the interview was on the demerits of the strategy under study. Most of the students believed that the merits of the strategy exceed its downsides, however, they reported on some of them such as unavailability of teacher that resulted in the increased anxiety.

Extract 7: *Although flipped context and metacognitive reading strategies' instruction were full of fun, actually, the teacher was not always available. This fact made me stressed.*

Time-wasting (on small points & on methods) were the other negative points of the strategy that are expressed in the following two extracts:

Extract 8: *Before this course, I knew something about scanning and skimming, but the negative point with this type of instruction was that sometimes, much time was wasted discussing a small point.*

Extract 9: *The flipped context was full of fun for me. Also, the strategies we learned were new and informative; however, the method and the procedures were time-wasting for me.*

The third question of the interview aimed to discover the attitudes of the participants on the role of metacognitive awareness raising strategy on improving the learners' reading performance. Most of the students reported on the attractive nature of the strategy that helped the learners to overcome the difficulties of the reading skill. In addition, self-assessment feedback and

time-management were the other two codes that the learners believed as key constructs playing critical roles in their reading performance.

Extract 10: *Most of the reading strategies were practiced that this practice resulted in reading improvement. Also, self-assessment in reading texts and teacher's feedback to the difficult areas in reading passages should not be ignored.*

Extract 11: *Self-evaluation approach was much more effective in improving my reading skill and it may be due to the time that expanded in the flipped environment. I had enough time to read the reading passage before the class as it was transferred before the class started.*

In terms of self-regulation and the influence that the metacognitive awareness raising strategy in flipped classroom had on it was the last question of the interview. EFL learners mentioned to the code of the actively engage in metacognitive awareness-raising tasks that caused improvement in reading comprehension and consequently improvement in the level of self-regulation.

Extract 12: *The strategy encourages students to engage in more active and in-depth usage of metacognitive awareness-raising tasks and hence their sense of self-confidence that leads to high self-control.*

Finally, the last code for the effect of the strategy on self-regulation was teacher's scaffolding as an assistant in detailed instruction of the difficult texts that caused improvement in students' SR levels.

Extract 13: *In my idea, the teacher helped the students with the true instruction of the details of the strategy that caused students improve their reading comprehension. This improvement as a result of teacher's scaffolding in the form of the strategy increased students' self-regulation levels.*

As it is axiomatic from the above extracts, the interviewees reported on the strategy's merits and demerits such as the time-wasting nature of the course, and the unavailability of the instructor as important downsides. However, the course motivated them as it was attractive. The flipped classroom had novelty to the learners when mitigated with metacognitive awareness raising in the flipped teaching context and caused their improvements in both reading performance and SR levels.

4.2. Discussion

The study has three different goals. The main objective of the research was to ascertain how the flipped classroom's metacognitive awareness raising method affected EFL students' reading comprehension. The study attempted to probe the attitudes of the participants in the EG on the benefits and drawbacks of the technique under consideration at three levels: the second level examined the effectiveness of the strategy on EFL learners' ability to self-regulate. The answers to the first research question showed that the low-

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level EFL learners in the EG outperformed CG learners on reading comprehension. The findings of the semi-structured interview confirmed the results of the t-test and demonstrated that the metacognitive awareness raising in flipped teaching environment had some merits. Metacognitive awareness gave students more chances to continue using their skills and tactics in texts and related activities for the time being as they developed their reading skills. This result was in line with earlier studies (Fitrisia et al., 2015; Viswanathan & Childers, 2003), which showed that raising students' awareness in terms of metacognition and incorporating that knowledge into lessons gives them enough time to respond and provide feedback on time. These results are consistent with some research that highlighted the value of developing metacognitive awareness and expertise in terms of metacognitive skill instruction (Anderson, 2012; Batang, 2015; Pintrich, 2002). Compared to less skilled and less successful learners, they found that high skilled English students show more metacognitive awareness of the ways learners use to complete tasks.

Conflicting findings have been found in the strategy education literature regarding the impact of metacognitive training on English proficiency. Similar to research conducted in general education settings, studies done in ESL and EFL settings have also looked into the impact of metacognitive strategies in relation to cognitive strategies on some facets of second language learning, such as academic achievement (James, 2010), reading performance (Yang, 2013), and listening comprehension (Goh, 2008; Kassaian & Ghadiri, 2011; O'Bryan & Hegelheimer, 2009). A body of evidence suggests a positive benefit of metacognitive awareness instruction (Milliner & Dimoski, 2021). It is worth notifying that the research on metacognition strategy and its role in English skills and sub-skills were mostly conducted on listening comprehension rather than reading comprehension or self-regulation, hence the studies on listening skill improvements through metacognition are ignored in this research.

The second goal of the study was to find out the effect of metacognitive awareness raising strategy in the flipped classroom on the EFL learners' SR levels. Based on the results of t-test, the learners' SR levels changed after the treatment as a result of the instruction in the form of metacognitive awareness raising, so the second null hypothesis was not approved. It is worth noting that there is little research that studied the effect of metacognition on self-regulation of L2 students, however, there are some studies that focused on the metacognitive self-regulation strategies (Mahmoodi & Karampour, 2019; Pintrich, 2000; Winne, 2011). The researchers thought that metacognitive techniques could be used to control how effectively a certain cognitive technique is applied. It was anticipated that educating learners to control and monitor the efficacy of their cognitive strategy usage would be successful in raising the efficacy of cognitive strategy employment and, consequently, their learning achievement (Leopold & Leutner, 2015). The benefit of

metacognitive strategies, which enable learners to function at a level that is higher than cognitive strategies and, as a result, control and regulate their behaviors, can be traced back as the cause of the efficiency of the metacognitive awareness raising strategy on Iranian EFL learners' SR. Furthermore, teacher's active participation motivated the learners and assisted them to increase SR levels. These justifications approved by the findings of the interview from the students in EG group.

The learners of EG in the interview sessions mentioned the secondary role of the flipped classroom and its mitigation with the strategy instruction as reasons for their improvement in reading comprehension. The reason can go back that a flipped classroom increases students' participation and gives them the opportunity to finish homework at home and find solutions to difficulties right away in class (Ozdamli & Asiksoy, 2016) and in the case that this context mitigated with the detailed instruction of metacognitive raising strategy, it can be resulted in reading performance, high self-confidence, and high self-regulation. As the learners reported, in flipped classrooms, they could attend online lectures, participate in online forums, or solve problems at home as a result of self-evaluation while participating in classroom activities guided by their instructor. However, some of the interviewees were reluctant on flipped setting due to the teacher's unavailability, they preferred the instruction in the form of metacognitive strategy that is intended to transform teaching into a student-centered mood.

5. Conclusion and Implications

To our best knowledge, this study is the only one to examine how well pre-intermediate level EFL students' reading comprehension and self-regulation are affected by a metacognitive awareness raising method in flipped teaching situations. The outcomes demonstrated that EFL students in the treatment group outperformed the control group in reading comprehension and self-regulation from the pre-test to the post-test. Nonetheless, because of this type of learning strategy's cooperative, enjoyable, confidence-building, and educational characteristics, the learners were happy with it. In conclusion, the results indicate that incorporating flipped classrooms with metacognitive development improved reading comprehension and SR levels in EFL students. In contrast, the flipped setting promotes a more participation of metacognitive techniques to support students in tracking and assessing their learning progress.

This research has a set of pedagogical implications for EFL instructors and learners. By being aware of this effective role of metacognitive awareness raising strategy in teaching reading skills, instructors may put it into practice to supply the learners with reading texts. The results suggest that teaching reading skills in a flipped classroom using metacognition

Hadji Seyed Hossein Khani, Fatehi Rad, & Jalali / The Effectiveness of Metacognitive 135 methodologies should take precedence over teaching traditional reading skills. Furthermore, EFL learners can experience a variety of learning strategies, such as raising metacognitive awareness in a flipped classroom instead of conventional methods of reading skill. By employing this strategy, they can regulate and control themselves while facing with anxiety-driven situations such as reading passages, learn to critically analyze the reading passages, and finally connect ideas or concepts that are similar to one another in order to improve the reading comprehension.

Various elements made the generalizability of the result of this study open to question. One of these was that the researchers could not continuously track student engagement outside and inside the classroom due to time and resource limitations. Hence fore, the amount of the learners' participation in out-of-class training in the flipped classroom could only be inferred from their self-reported data. Therefore, it is unclear how much the participants took part in the flipped classroom. Also, the small size of the sample, as a limitation, could affect the results. However, extra research is required to consider the role of age and gender on reading comprehension and the role of metacognitive awareness raising strategy on the chunks and collocations, as a group of words that are taken as single entities, as well as on different language skills and sub-skills, such as grammar and speaking skill.

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