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Comparative Effect of Scaffolding Instruction and Self-Regulated Learning on ESP Learners' Reading Comprehension

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ABSTRACT

The present research was carried out to investigate the effect of scaffolding and self-regulation on the reading comprehension of ESP students. For this purpose, one hundred and thirty ESP students who had passed prerequisite general English courses and who were about to take the professional English course were chosen. Further, through the PET test they were homogenized. Besides, the participants were non-randomly assigned to two experimental groups and one control group. Therefore, a quasi-experimental design was adopted to test the effect of scaffolding instruction and self-regulated learning on ESP learners' reading comprehension. This study had a pretest before the treatment and a posttest at the end. Then, in order to find whether, scaffolding or self-regulation could be more effective on ESP students' reading comprehension, the pretest scores were compared with the posttest scores. The statistical measure of MANOVA was used to test the group scores and compare them against each other. The analysis of the data revealed that the experimental group in relation to scaffolding effect on reading comprehension outperformed the control group. In addition, it was found that the scaffolding group significantly outperformed the self-regulation learning group on the posttest of reading comprehension. This study has implications for students and teachers.

Keywords: *Self-Regulation, Scaffolding, ESP, Reading Comprehension, Quasi-Experimental Design*

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1. Introduction

Researchers (e.g. Carrell, Devine, & Eskey, 1988) hold that reading is the most significant skill of a second language. It is an important skill for most students of English throughout the world, especially in countries where foreign language learners do not have the opportunity to interact with native speakers but have access to the written form of that language (Rivers, 1968). Aebersold and Field (1997) emphasize that the acquisition of reading skills in a second or foreign language is a priority for millions of learners around the world, and there is a growing demand for both effective reading courses as well as high-quality second language reading materials. Paris, Lipson and Wixson (1983) highlight that learning to be a strategic reader can promote reading comprehension and "failure to be strategic in reading may result from either developmental inability or poor learning" (p. 293).

According to Celce-Murcia (2001), teaching reading skills to non-native

speakers of English involves unique problems and challenges and students clearly need help in learning to read in a foreign language. Hosenfield (1984) believes that many students learn strategies that impede their obtaining meaning efficiently. Pressley (2006) contends that language learners should be taught strategic reading through explicit instruction. Janzen and Stoller (1998) maintain that it cultivates learners' autonomy and self-awareness of the meaning constructing process and it also prepares pre-university students for academic reading performance. Reading strategies are of interest for what they reveal about the way readers manage their interactions with written texts. Some instructional strategies, which focus on teaching reading to learners in order to improve their ability to comprehend, are necessary. Undoubtedly, ESP as a trend in the framework of ELT (Dudley-Evans & St John, 1998) is not an exception to the rule, and obviously the framework of ESP



textbooks in such contexts reveals that the most important skill is reading.

The current study was an attempt to see if scaffolding and self-regulation contribute to ESP students' reading comprehension and which of the reading strategies of scaffolding and self-regulation may affect the reading comprehension of ESP students more than the other. The importance of reading comprehension in academic studying is one of the prominent investigations all over the world. Therefore, it seems essential to work on the strategies to improve the comprehension in this field. It must be decreased slowly as students' ability increases or as they become more and more independent in their learning, making sure that they have bridged the gap between what they knew and what they have learned (Berk, 2002; Krause, Bochner, & Duchesne, 2003; McDevitt & Ormrod, 2002). ESP courses favor a great deal of attention and emphasis among the EFL practitioners and learners, especially at universities. However, among various successful reading strategies which can improve reading comprehension, scaffolding and self-regulation are the ones which have remained less researched and less investigated. By and large, scaffolding must be consistent, temporary, supportive, flexible, and appropriate for them. It provides the instructional routines and strategies teachers need to help students extract and construct meaning. The actual process of self-regulating can be a source of motivation, even for those tasks that may not be motivating themselves. Thus, the effect of two strategies of scaffolding and self-regulation on ESP learners' reading comprehension was unproved up to now. As a result, the following research questions were formulated to investigate this effect in the present study:

Does teaching reading through scaffolding have any significant effect on the Iranian ESP learners' reading comprehension?

Does teaching reading through self-regulation learning have any significant effect on the Iranian ESP learners' reading comprehension?

Is there any significant difference between the effect of scaffolding and self-regulation on Iranian ESP learners' reading comprehension?

2. Review of the Related Literature

2.1 ESP in Language Teaching

The concept of special language occurred in 1960s and early 70s. It is

noticeable that ESP has developed at different speeds in different countries. The language of ESP refers to international English, English as an International Language (EIL), the language that is presented as an internationalization of structures of general English for the purpose of their application (Harding, 2007). ESP developed as an independent discipline apart from general English, and it gained popularity throughout the world, especially in tertiary education where learners specialize in different areas. While ESP has to establish itself as either a complete profession or as a clear sub-discipline in the language sciences (Swales, 2000). As a type of ELT (Kennedy, 2001; Master, 2005), it can be divided into different types (Belcher, 2006; Nunan & Carter, 2001). Traditionally, ESP has two main types: English for Academic Purpose (EAP) and English for Occupational Purposes (EOP) (Belcher, 2006). EOP can be subdivided into English for Professional Purposes (EPP, e.g. EMP) and English for Vocational Purposes (EVP) or Vocational English (Dudley-Evans & St John, 1998, p. 6). EAP focuses on equipping learners with the specific communicative skills to participate in these environments (Hyland & Hamp-Lyons, 2002). EAP is also subdivided into many types. According to McDonough (1984), Dudley-Evans and St John (1998), and Jordan (2002), the main type of EAP is considered to be English for Science and Technology (EST). Hutchinson and Waters (1987) provide a five-stage overview of the development of ESP. At each stage, one area of activity appears to be important. Those five stages are the concept of special language, register analysis, rhetorical or discourse analysis, target situation analysis (TSA), skills and strategies and learning-centered approach.

2.2 Reading Skill and Reading Process

Nowadays, there is an increasing awareness of the significance of the reading skill in schools and universities. The progressive nature of technological developments has made reading more crucial. Reading could be regarded as the most important activity in any language class in ELT contexts, not only as a source of technical information and a pleasurable activity, but also as a means of consolidating and extending EFL learners' knowledge of the language (Rivers, 1981). However, reading is not an isolated activity taking place in a vacuum. Bernhardt (as cited in

Liu, 2010) highlighted the cognitive requirements of reading and argued that taking a cognitive perspective to reading means considering the reading process as an intrapersonal problem solving that takes place in the knowledge structure of the reader's brain. Thus, comprehending a text requires different processes and techniques. While reading, students experience deficiencies in their reading skills such as restricted vocabulary and structural knowledge that affect their comprehension and threaten their motivation. Among the most facilitative factors, affecting reading comprehension is various reading strategies that enable the learner to extract meaning from the text despite blocks to comprehension. The use of strategies is only one of the characteristic features of the reading that alludes to the highly complex nature of this mental, interactive, and cognitive process.

2.3 *The Reading Process*

As stated by Chastain (1988), the noun 'process' is defined as a system of operations in the making of something. The word 'operations' implies that a process consists of activities. These activities are systematized, and the systematized activities result in a product. Since reading by definition signifies comprehension, the phrase 'reading processes' implies an active cognitive system operating on printed material to arrive at an understanding of the message, which is the final product. During the process, the writer's goal is to activate background and linguistic knowledge to create meaning. Now the reader's task is to activate background and linguistic knowledge to recreate the writer's intended meaning. Theoretical support for this view of communication comes from the schema theory.

2.4 *Implications of Teaching Reading*

Eskey and Grabe (1988) considered two general implications. The first one is devoting some time in reading classes to such relatively bottom-up concerns as the rapid and accurate identification of lexical and grammatical forms. The second one is devoting some time in reading classes to such top-down concerns as reading for global meaning, developing a willingness to take chances, and developing appropriate and adequate schemata for the proper interpretation of texts. According to Carrell (1988), because of the limitations on information-processing capacity and short-term memory, overreliance on text-based or

bottom-up processing will produce a log-jam in the system – the reader attempts to store too many separate pieces of information without any higher-order relationship among them. She adds that overreliance on knowledge-based or top-down processing will also cause knowledge-biased processing, or schema interference in which text-based processing will be neglected. In contrast, Hinkel (2006), by referring to the key role of bottom-up processing, suggests the priority of working on phonics, word recognition, and graphic knowledge to sentence and text level instruction. According to Ediger (2001), for English language learners to read fluently, they must develop the ability to use component skills and knowledge areas together simultaneously and rapidly. She adds that the task of effective reading program is to provide information and practice in all systems, which contribute to making the process work.

2.5 *Scaffolding*

Scaffolding was originally introduced in the context of adults assisting children in acquiring knowledge or solving problems in informal learning environments (Wood, Bruner, & Ross, 1976). Later, it was adjusted to include a wider range of learners with diverse learning goals in formal education (Sharma, Forlin, Loreman, & Earle, 2006). With the development and application of new technologies in education, such as computer technologies, scaffolding was further expanded to learning environments based on these new technologies (Davis, 1996; Davis & Linn, 2000). More recently, the success of distance education is attracting interests for utilizing scaffolding in distance learning environments (Bean & Stevens, 2002; Bonk, Malikowski, Angeli & Supplee, 1998; Orrill & Galloway, 2001). Despite the increasing interest in scaffolding, researchers have different understandings upon which the concept of scaffolding is built and issues related to it, such as its meaning and scope. As a result, the term scaffolding is often used rather loosely (Hammond & Gibbons, 2005). Thus, research studies involving scaffolding may or may not share common ground, which then requires careful judgment before applying the research findings to practice or conducting further studies based on them.

From its definition, we can see that the nature of scaffolding is instructional intervention, which is intentionally designed



to enhance student's learning. Furthermore, scaffolding is not just any form of support that is offered to students. It has to be the support that helps learners construct knowledge and thinking rather than remembering simple facts (Hammond & Gibbons, 2005). Beed, Hawkins, and Roller(1991) classified scaffolding into five levels. From concrete to abstract, they are full modeling, assisted modeling, elements cueing, strategy cueing, and general cueing. In addition to learners' ZPDs, the level of scaffolding also varies based on other factors, such as task difficulty and learners' developmental level. In general, the more difficult a task, the more concrete the scaffolding should be. The less advanced a student's developmental level, the more concrete the scaffolding should be.

2.6 Self-Regulation

The ultimate goal of scaffolding is to develop an independent, self-regulated learner. This is accomplished by fading the support, or relinquishing the control and assistance provided by the more knowledgeable person as the child begins to achieve more independence and knowledge. To accomplish this, the more knowledgeable person must permit the child to deal with questions and problems and regulate the joint activity, intervening only when the child is not able to manage effective problem solving.

Self-regulation is key to the child's learning and mastery over his own behavior. Self-regulation and independence are also the desired outcome or goal for scaffolding. The key issue at this point is the teacher's developing awareness through skillful observation and reflection of the child's level of competence. If the teacher continues to influence the child's behavior through explicit commands and providing immediate answers to momentary problems, then the child will remain dependent upon the support of the more knowledgeable person (Dorn, French, & Jones,1998; Lyons, 2003). When teachers, parents, and peers provide the support for the child's task behavior by asking questions that allow the child to participate in the discovery of solutions, learning and self-regulation are optimized (Roberts & Barnes, 1992).Diaz, Neal, & Vachio (1991)found that a child's independence and self-regulation are obtained when her/his competent performance is affirmed, and tutorial relinquishing of control by the tutor is

associated with a child's task engagement and autonomy.

2.7 Previous Studies

Research on the effect of scaffolding yields mixed results although most researchers claim that scaffolding is effective in enhancing students learning. The majority of the studies that compare instructions with and without scaffolding reveal that scaffolding can support various learners with different learning goals (Ge & Land, 2003; King, 1991; Salmon, Globerson, & Guterman,1989).

Amirian, Mallahi and Zaghi (2015) investigated relationship between self-regulatory vocabulary strategy use and vocabulary size. They found that self-regulatory vocabulary strategy use did not have any effect on vocabulary size. Besides, the results of this study indicated that metacognitive control made a better contribution to the prediction of learners' vocabulary size.

Another study by Lange, Costley and Han (2016) reports the results of effect of group work scaffolding on participation. It was found that there is no relationship between scaffolding and participation. In addition, the results showed that more developed and structured group tasks improve the overall learning experience of group work. Results from King (1991) and Salmon et al.'s (1989) study also revealed that scaffolding could significantly improve students' performance in problem solving and reading comprehension. However, a study by Azevedo, Cromley, and Seibert (2004) demonstrated findings which were in contrast with those of other studies. Graesser and Person (1994) used student-generated questions to enhance learning in research methods and algebra. The research findings showed that the quality of students' questions positively influenced their achievement. Jarvela (1995) conducted a qualitative research to study the interaction between scaffolder and learner. Based on her findings, she points out that it is important to establish inter subjectivity between teacher and students. She further indicates that students must commit to their own learning in order to achieve inter subjectivity and successful learning.

Within the circle of foreign language learning, Haghparast and Mall-Amiri (2015) examined the effect of two scaffolding strategies including (question answering and question generating) on intermediate EFL

learners' reading comprehension via a pretest-posttest design. However, no significant difference between the effects of the two scaffolding strategies on reading comprehension of EFL learners was reported.

3. Method

3.1 Participants

The participants selected of this study were 90 ESP learners who studied graphic at the *Elmi-Karbordi University Branch* in Tehran, Iran. These 90 learners were chosen from among 130 students who had passed prerequisite general English courses and who were about to take the professional English course were chosen. In order to homogenize the participants, they took the proficiency test PET. After administering the PET, 90 students whose scores fell one standard deviation below and above the mean were chosen for the study. The age range of the participants was between 19 to 25 years old, and their gender varied, so this study was not sensitive to the gender. They were junior students.

3.2 Instrumentation

The first instrument was PET test which was used to homogenize the participants. The test contained just the reading comprehension part, which was 5 parts. It included 35 questions and students should answer them in 30 minutes. Each correct answer received one point, and there was no penalty for wrong answers. Therefore, the potential range of the scores was between 0 and 35. The second instrument was the course book, namely *English for the Students of Visual Arts (Painting, Graphics, & Sculpture)* written by Hossieni, Ashki, and Rastegarpour. This ESP course book was used to determine the effect of scaffolding and self-regulation learning on reading comprehension. The third instrument was a system of pre-test and post-test. The pretest was taken from the Iranian university entrance exam of 2016 for students who wanted to continue their Education in Master level of graphic. The scores of the pretest were compared with the result of posttest. The pretest contained just the reading comprehension part of the University Entrance Exam of 2016.

3.3 Data Collection

The study was conducted on three separated ESP classes of graphic. Ninety male and female students in Elmi-Karbordi University participated in this study. The classes were held for 12 sessions, each taking 90 minutes. Primarily, the pre-test

was administered and its scores were obtained. One of the three classes was the control group (class A), and the two others were the experimental groups, in which scaffolding (class B) and self-regulation (class C) were used as strategies of teaching ESP reading comprehension. In contrast to the two experimental groups who worked collaboratively in pair-subgroups, students in the control group worked individually in a completely traditional teacher-centered setting. Besides, in a different manner, the three groups received treatments. Although all classes worked on the same reading passages from the same book, in the first experimental group (class B), there was both peer and teacher scaffolding simultaneously (such as skimming, scanning). In each session, the teacher explained some of the reading techniques such as skimming, scanning, getting the main idea, note-taking, reading chunk by chunk not word by word, visualization, guessing unknown vocabularies, etc. to the students.

However in the second experimental group (class C), there were self-regulation strategies (prediction, summarizing, question generation). Also, it was tried to activate the students' prior knowledge and form new knowledge by applying some pre-reading activities like asking questions about the title of the text and making some comments about it. Self-regulation is not an easy task to be analyzed and interpreted. In this aspect, Pintrich's (2005) model was useful as it offers a taxonomy of different processes and components that could be involved in a SRL (self-regulation learning). Pintrich categorized

self-regulatory processes into 4 phases, and divided each phase into 4 areas for regulation. In this study, the researcher observed most of the components of this model clearly. For example, in general, while comprehending the text, the participants regulated their cognition, motivation and behavior, as well as some part of the task. Also, while comprehending the academic material, they went through all of the 4 phases as suggested in the model. Moreover, in contrast to two experimental groups, in the control group, students worked individually and sometimes just a very little scaffolding came from the teacher.

3.4 Data Analysis

For the purpose of examining the effect of the experimental treatment, a research hypothesis corresponding to the research question was proposed. The null-hypotheses



of the research questions were analyzed using one-way analysis of variances (one-way ANOVA). Following the ANOVA tests, Scheffe tests were performed as all post hoc comparisons among means in order to investigate the effect of scaffolding and self-regulation on reading comprehension of ESP learners.

4. Results and Discussion

4.1 Pretest of Reading Comprehension

A one-way analysis of variances was run to compare the scaffolding, self-regulation and control groups' means on the pretest of reading comprehension (RC) in order to prove that they enjoyed the same level of reading comprehension ability prior to the main study (Figure 1). Before discussing the results, it should be mentioned that the assumption of homogeneity of variances was met (Levene's $F(2, 87) = .004, P = .996$) (Table 1).

Table 1: Test of homogeneity of variances; pretest of reading comprehension

Levene Statistic	df1	df2	Sig.
.004	2	87	.996

The results of the descriptive statistics displayed in Table 2 indicated that the scaffolding ($M = 8.50, SD = 3.20$), self-regulation ($M = 8.33, SD = 3.22$) and control ($M = 8.10, SD = 3.26$) groups had almost the same means on the pretest of RC.

Table 2: Descriptive statistics; pretest of reading comprehension by groups

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
scaffolding	30	8.50	3.203	.585	7.30	9.70
Self-regulation	30	8.33	3.220	.588	7.13	9.54
control	30	8.10	3.263	.596	6.88	9.32
Total	90	8.31	3.196	.337	7.64	8.98

Based on the results displayed in Table 3 ($F(2, 87) = .116, P = .890, \omega^2 = .020$ representing a weak effect size), it can be concluded that there was not any significant difference between the means of the three groups on the pretest of RC. Thus, it can be claimed that they were homogenous in terms of their reading comprehension ability prior to the main study.

Table 3: One-way ANOVA; pretest of reading comprehension

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2.422	2	1.211	.116	.890
Within Groups	906.867	87	10.424		
Total	909.289	89			

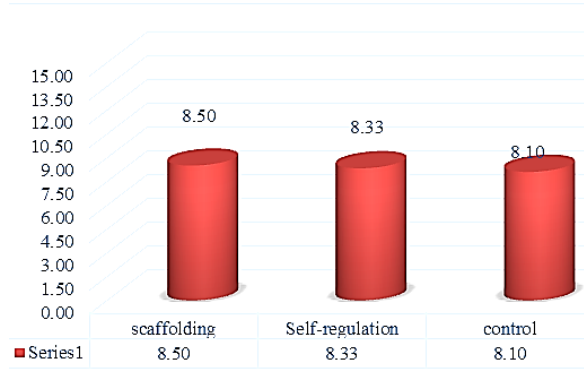


Figure 1: Pretest of reading comprehension by groups

Null-Hypotheses

Based on the research questions the following null hypotheses were suggested:

H01. Teaching reading through scaffolding does not have any significant effect on the Iranian ESP learners' comprehension.

H02. Teaching reading through self-regulation learning does not have any significant effect on the Iranian ESP learners' comprehension.

H03. There is not any significant difference between the scaffolding and self-regulation in ESP learners' comprehension.

A one-way analysis of variances plus post-hoc Scheffe's tests were run to compare the scaffolding, self-regulation and control groups' means on the posttest of reading comprehension (RC) in order to probe the null-hypotheses posed in this study (Figure 4.1). Before discussing the results, it should be mentioned that the assumption of homogeneity of variances was met (Levene's $F(2, 87) = .014, P = .986$) (Table 4).

Table 4: Test of homogeneity of variances; posttest of reading comprehension

Levene Statistic	df1	df2	Sig.
.014	2	87	.986

The results of the descriptive statistics displayed in Table 5 indicated that the scaffolding group ($M = 12.40, SD = 2.71$) had the highest mean on the posttest of RC. This was followed by the control ($M = 9.53, SD = 3.20$) and self-regulation ($M = 8.77, SD = 3.07$) groups.

Table 5: Descriptive statistics; posttest of reading comprehension by groups

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
scaffolding	30	12.40	2.711	.495	11.39	13.41
Self-regulation	30	8.77	3.070	.561	7.62	9.91
control	30	9.53	3.203	.585	8.34	10.73
Total	90	10.23	3.359	.354	9.53	10.94

Based on the results displayed in Table 6 ($F(2, 87) = 12.21, P = .000, \omega^2 = .199$ representing a large effect size), it can be concluded that there were significant differences between the means of the three groups on the posttest of RC. Since the results of the one-way ANOVA were significant, the post-hoc Scheffe's tests were run to compare the groups two by two in order to find answers for the above mentioned three null-hypotheses.

Table 6: One-way ANOVA; posttest of reading

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	220.067	2	110.033	12.210	.000
Within Groups	784.033	87	9.012		
Total	1004.100	89			

Based on the results displayed in Table 5 and Table 7 it can be claimed that; the scaffolding group ($M = 12.40$) significantly outperformed the control ($M = 9.53$) group on the posttest of reading comprehension ($MD = 3.63, p = .000$). Thus, the first null-hypothesis as teaching reading through scaffolding did not have any significant effect on the Iranian ESP learners' comprehension was rejected.

Table 7: Multiple comparisons; posttest of reading

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error
Scaffolding	Self-regulation	3.633*	.775
	Control	2.867*	.775
Control	Self-regulation	.767	.775

There was not any significant difference between the self-regulation ($M = 8.77$) and the control ($M = 9.53$) group on the posttest of reading comprehension ($MD = .67, p = .614$). Thus, the second null-hypothesis as teaching reading through self-regulation learning did not have any significant effect on the Iranian ESP learners' comprehension was supported.

The scaffolding group ($M = 12.40$) significantly outperformed the self-regulation learning ($M = 8.77$) group on the posttest of reading comprehension ($MD = 2.86, p = .002$). Thus, the third null-hypothesis as there was not any significant difference between the scaffolding and self-regulation in ESP learners' comprehension was rejected.

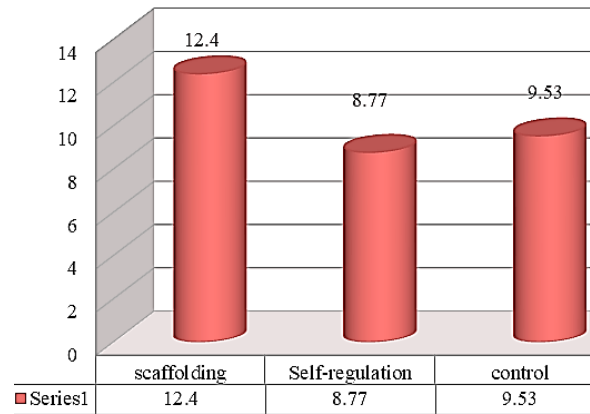


Figure 2: Posttest of reading comprehension by groups

4.2 Discussion

The results of the descriptive statistics displayed in Table 2 indicated that the scaffolding ($M = 8.50, SD = 3.20$), self-regulation ($M = 8.33, SD = 3.22$) and control ($M = 8.10, SD = 3.26$) groups had almost the same means on the pretest of RC. According to the results displayed in Table 6 ($F(2, 87) = 12.21, P = .000, \omega^2 = .199$ representing a large effect size), it can be concluded that there were significant differences between the means of the three groups on the posttest of RC. Since the results of the one-way ANOVA were significant, the post-hoc Scheffe's tests were run to compare the groups two by two in order to find answers for the mentioned three null-hypotheses.

In order to test the first null hypothesis, the performances of the participants in the control and the scaffolding instruction groups were compared on their posttest. Table 5 and 7 depicted the descriptive statistics for this comparison. It means that the scaffolding group ($M = 12.40$) significantly outperformed the control ($M = 9.53$) group on the posttest of reading comprehension ($MD = 3.63, p = .000$). Therefore, the researcher safely rejected the first null hypothesis that "teaching reading through scaffolding does not have any significant effect on the Iranian ESP learners' comprehension".

The second null hypothesis required the researcher to check and see if there was a difference between the performance of the self-regulated group and that of the control group. For this purpose, the results of the posttest for the two groups were compared. Table 5 and 7 show the descriptive statistics for this comparison. There was not any significant difference between the self-regulation ($M = 8.77$) and the control ($M = 9.53$) group on the posttest of reading comprehension ($MD = .67, p = .614$). The data show a meaningful difference between



the two means; in other words, the self-regulated group didn't have a better performance than the control group.

Consequently, the second null hypothesis stating "teaching reading through self-regulation learning does not have any significant effect on the Iranian ESP learners' comprehension" is safely supported, and it can be said that teaching reading comprehension by self-regulated strategy is not better than the traditional strategies.

Through proposing the third hypothesis, the researcher intended to find out which strategy could produce a better result: scaffolding instruction or self-regulated learning. The performances of the two groups on the posttest were compared to see which group had a better performance. Table 5 reports the descriptive statistics for this comparison.

The scaffolding group ($M = 12.40$) significantly outperformed the self-regulation learning ($M = 8.77$) group on the posttest of reading comprehension ($MD = 2.86$, $p = .002$). Therefore, the third null hypothesis that "there is not any significant difference between the scaffolding and self-regulation in ESP learners' comprehension" was rejected leading us to conclude that the scaffolding instruction group performed better on the posttest of reading comprehension than the self-regulation group.

After presenting the results, it is time to discuss the reasons why these results were obtained. Regarding the first null hypothesis, this study revealed that scaffolding instruction has positive effect on reading comprehension of ESP students. Students benefited from scaffolding strategies such as simplifying the language, asking for completion, note generation, and using visuals. It is expected that as efforts to facilitate students in building relationships between concepts, the scaffolding methods may also help them better understand the underlying structure of subject matters and thus improve their achievements in other academic areas, such as comprehension and recall of instructional contents. It is a learning process designed to promote a deeper level of understanding that is the support given during the learning process, which is tailored to the needs of the students with the intention of helping the student achieve their learning goals (Sawyer, 2006).

Regarding the second null hypothesis, the participants in the control group performed better than the participants in the class of self-regulated learning in reading comprehension. By investigating the third null hypothesis, it was found that the scaffolding group revealed a better performance than the self-regulation group.

Davies and Pears (2003) claimed that motivating learners in a class is more difficult with just chalk and talk or a textbook only. The findings of the present study are compatible with some of the empirical studies conducted earlier and reported in literature review. Rumelhart and Ortony (1997) state that reading is assumed as a simultaneous perceptual and cognitive process. The reader should be able to draw simultaneously from a variety of sources to understand the text such as lexical, orthographic, schematic, semantic, syntactical, and visual.

The results of this study are also consistent with Hartman (2002), in which the author proposed that scaffolding may include models, cues, prompts, hints, partial solutions, think-aloud modeling and direct instruction. Therefore, this strategy is expected to be helpful in overcoming the specific problems the learners have already displayed in reading comprehension. However, results from the study indicated that students performed equally well with or without the different types of scaffolding. These findings are in line with many researchers such as Coltman, Petyaeva, and Anghileri (2002), Day (1983), Pressley, Hogan, Wharton-McDonald, Mistretta, and Ettenberger (1996), and Sharma (2001). Therefore, this strategy is expected to be helpful in overcoming the specific problems the learners have already displayed in reading comprehension.

5. Conclusion

The purpose of the present study was to investigate the comparative effect of scaffolding instruction and self-regulated learning on reading comprehension of ESP learners. To achieve this purpose, three research questions and three corresponding null hypotheses were proposed. All the three research hypotheses were investigated empirically. Two of them were rejected and one of them was supported. In addition, the scaffolding group performed more than the group who worked reading by self-regulated techniques, and the difference between groups in terms of means was statistically

significant. Therefore, it can be argued that teaching reading comprehension to ESP learners by scaffolding techniques were more effective in this regard than the self-regulated learning and control group. Based on these findings, the following conclusions are made.

Based on the results of the study, it is concluded that scaffolding techniques help ESP learners improve their comprehension more than self-regulated techniques. As the results of the study revealed, there was a significant improvement in learners' comprehension when they used scaffolding techniques like simplifying the language, asking for completion and using visuals. According to the results of the study, it can be concluded that scaffolding instruction is effective in improving the reading comprehension of ESP learners. In traditional classes, reading comprehension worked as a boring task by reading and translating sentence by sentence dynamically. Therefore, learners just memorized the words and answered questions or exercises by those translations. Therefore, the reading parts were always tedious and awful for them. Students are given support until they can apply new skills and strategies independently during the process of scaffolding.

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