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The Effect of Scaffolding Types on Iranian EFL Learners' Reading Ability and Reading Strategy in Different Experimental Situations

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Abstract

The present mixed-method research has been prepared to probate scaffolding types on Iranian EFL learners' reading ability and reading strategy. To achieve this end, a multiphase design was implemented, and researchers recruited a total number of 80 homogeneous intermediate students from Azad University of Bandar Abbas in Iran. The sample was divided into four groups as Soft Scaffolding Group (SSG), Hard Scaffolding Group (HSG), Reciprocal Scaffolding Group (RSG), and Virtual Scaffolding Group (VSG). The participants of these groups received a validated researcher-made pretest of reading comprehension, a validated posttest of reading comprehension, along a test of reading strategies. In addition, the students' self-reports and portfolios, and the researchers' observations and notes through filling out the checklists were used. Considering the students' reading ability development, the results indicated that complex scaffolding enjoyed the highest mean on the posttest of reading. Regarding reading strategies, the findings highlighted that different scaffolding treatments had other effects on the development of global, problem solving, and supporting reading strategies among Iranian EFL learners. The hard-scaffolding group had the highest use of reading strategies, followed by the virtual scaffolding group. Nevertheless, reciprocal and soft scaffolding groups similarly had less use of reading strategies.

Keywords: EFL Context; Reading Ability; Reading Strategy; Scaffolding Types

INTRODUCTION

In today's world, ever-growing needs for mastery over the English language in general and reading in English, particular have given priority to finding more effective ways to teach English (Ness, 2016). Likewise, with the emergence of sociocultural approaches to teaching EFL, the nature of reading comprehension development has undergone considerable changes in recent years (Aro & Lyytinen, 2016). Reading comprehension skills for the EFL learners is influenced by the inquiry learning approach in which the learners experience the procedures of investigating, choosing, gathering, dissecting, and understanding data sources (Buslon & Alieto, 2019). As Brevik (2019) presents, "reading is an active process of comprehending where students need to be taught strategies to read more efficiently (e. g., guess from context,

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define expectations, make inferences about the text, skim ahead to fill in the context, etc." (p. 282). Brown (1980) characterized reading strategy as "any deliberate playful control of activities that give birth to comprehension" (p. 456). In the present study, scaffolding has been presented through various virtual, complex, and reciprocal forms to help the Iranian EFL learners improve their reading comprehension and reading strategies.

"Scaffolding" is an idea taken from cognitive psychology and L1 investigation. It expresses that in a social collaboration, a proficient member can make a setting by speech and supportive conditions in which the novice learner can take part in and extend current abilities and learning to a higher level of competence (Gibbons, 2002). Scaffolding has become one of the significant issues with the work of Vygotsky, with modern researchers and educators interested in continuing its development and application. Vygotsky (1978, P. 78) argued that "learning occurs through dialogues in the Zone of Proximal Development (ZPD)". This is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through trial solving under adult guidance or in collaboration with more capable peers" (p. 86). In this respect, Wibowo, Syafrizal, and Syafryadin (2020) argued the significance of English teachers' teaching reading comprehension strategies. As they contend, teacher feedback and the strategies teachers use can pave the way for the learners' likely strategy development in this respect.

For many years, the understanding of foreign language learning difficulties has been a crucial point of interest among foreign language (FL) educators. "Great attention has been paid to teaching EFL students the literacy skills they will need to succeed in tertiary institutions abroad" (Ferris & Tagg, 1996**,** p. 479, as cited in Baker, 2015). Though such studies have been very helpful to EFL teachers, few have looked beyond ordinary methods of teaching reading and writing skills (Baker, 2015; Buslon & Alieto, 2019; Kim & Craig, 2012; Kozulin, 2002). Minimal research attention has been directed toward the role of scaffolding types in the development of reading comprehension among Iranian EFL learners. For example, Attarzadeh (2011) has focused on scaffolding reading comprehension of various text modes on Iranian EFL learners with different proficiency levels. However, he has not compared different types of traditional scaffolding (hard, soft, and reciprocal) together or with the virtual scaffolding. Riazi and Rezaii (2011) have studied teacher-and peer-scaffolding behaviors and their effects on EFL students' writing improvement. Also, Rahimi and Tahmasebi (2011) have surveyed the impact of private speech and scaffolding in reading comprehension used on among Iranian EFL learners.

Existing studies on reading development among EFL learners have been more strongly influenced by fads and fashions than teaching this skill (Richards, 2008). The emergence of communicative language teaching in the 1980s led to changed views of syllabuses and methodology, continuing to shape approaches to teaching communicative skills today (Gilakjani, 2012). However, the new educational conditions, highly affected by the emergence of technologies, require novel methods of teaching and learning reading (Deshpande, 2016). The researchers' personal experiences in the EFL classes also reveal that most students lack the confidence to be equipped with different language skills, including reading. The fact is that EFL students need a more student-centred what fosters collaborative learning incorporating peer tutoring and group working (Brevik, 2019; Ockey, Koyama, Setoguchi & Sun, 2015). In this regard, the researchers will take consider Vygotokyan approach to learning and teaching embedded and extended in interactionist and sociocultural theories focusing on ZPD. Consequently, this study is fixed on investigating the possible effects of different types of scaffolding (soft, hard, reciprocal, and virtual) on the development of reading comprehension and reading strategy development among Iranian EFL learners. The study focused on the EFL context, which refers

to the Islamic Azad University of Bandar Abbas. The study attempted to see the effect of scaffolding types on Iranian EFL learners' reading ability and reading Strategy. To state specifically, this research investigated the impact of different kinds of scaffolding (hard, soft, reciprocal and virtual) on the reading skill of Iranian EFL learners. It also examined the effects of different types of scaffolding on the development of EFL learners' reading strategies. Moreover, this work aimed at finding the possible difference among various types of scaffolding regarding their effects on EFL learners' reading skill and strategies. On top of that, the students' perceptions of different scaffolding treatments were assessed by conducting the present research.

Research Questions

Considering the problems stated above and the purpose of the present study, the following research questions have been formulated.

1. *What are the effects of hard, soft, reciprocal and virtual scaffolding on the reading skill of Iranian EFL learners?*
2. *What are the effects of soft, reciprocal and virtual scaffolding on the development of EFL learners' reading strategies?*
3. *Is there any statistically significant difference among various types of scaffolding regarding their effects on EFL learners' reading skill and strategies?*
4. *What are the students' perceptions towards different types of scaffolding treatments?*

METHODS

Participants

The study participants were 80 intermediate level male and female students with the age range 19 to 25 in the Islamic Azad University of Bandar Abbas. These participants were chosen from 100 intermediate students according to their performance in a sample Preliminary English Test (PET) which was first piloted with 30 students with similar characteristics, to check the reliability of the test. It should be mentioned that the pilot sample learners were of the same (intermediate) level English language proficiency studying at the same branch of Islamic Azad University.

Materials

Three instruments were employed in the quantitative section including a Preliminary English Test (PET), a pre and post-test of reading, as well as a reading strategy questionnaire as both pre and post-tests. In the qualitative section of the study, two instruments as the learners' self-reports and the teacher's observations and notes were used to collect the data.

Preliminary English Test (PET)

To homogenize students at an intermediate level, a copy of the piloted, PET that checked to listen, speaking, reading, and writing was used. This test was in four parts and the total mark was made by adding all the results together. The administration of the whole test will take 120 minutes. The rating was done based on the criteria stated in the rating scales, including the rating scale of 0-6 for PET. The PET test was administered to 30 students to probe its ability indices before administering the main study.

Pre and Posttests of Reading Comprehension

Two parallel versions of multiple-choice reading comprehension tests were selected from among the standard reading tests presented in the test manual of the learners' coursebook. These tests were given to the chosen participants after the test of language proficiency as the pretest and at the end of the treatment phase as the posttest. The pretest was piloted among 30 students with the same characteristics as the main participants of the study to calculate its reliability and any modifications required. This test was used as the pretest in the present study to measure and compare the participants' reading comprehension before the treatment. The pretest was administered at the beginning of the semester to ensure the homogeneity of learners in all the groups regarding their reading comprehension. The reading posttest was a new

test which was similar to the pretest but different in terms of its texts. The test was also piloted among 30 students with the similar characteristics. The posttest was administered at the end of the semester to measure reading comprehension ability of the learners concerning what they had learned throughout the course.

Survey of Reading Strategies

Reading Strategy Questionnaire developed and validated by Sheorey and Mokhtari (2002) was used in the present study to collect information about the various strategies the participants use when they read academic materials in English. This includes (e.g., reading textbooks for homework or examinations, reading journal articles, etc.). This scale which is an adaptation from Oxford's 1990 learning strategy scale, incudes 30 items, and the reliability of this scale has been reported as (α=0.81) based on Cronbach's alpha. The overall average indicates how often the learners use reading strategies when reading academic materials. The average for each subscale shows which group of strategy (i.e., *global*, *problem-solving*, or *support strategies*) they use most often when reading. However, it is important to note that the best possible use of these strategies depends on learners' reading ability in English, the type of material read, and their reading purpose. A low score on any of the subscales or parts of the inventory indicates that there may be some strategies in these parts that they might want to learn about and consider using when reading. This scale was given to all participants both before and after the treatment phase.

Students' Self Reports / Teachers' Observation and Notes

To collect the qualitative data, the participants in all four experimental groups were asked to take notes of the strategies they employed while covering reading materials, the challenges they had in understanding or comprehending the texts, and what they did to solve their problems. A checklist for the application of scaffolding principles was developed and used in the qualitative phase of the study. Furthermore, based on the checklist, the researcher herself observed and checked whether the principles of each sort of scaffolding were implemented in each experimental group appropriately. More importantly, the researcher recorded treatment sessions to assess the collected data more thoroughly. The results of the students' reports and teachers' observation and notes elicited from the checklists were tabulated in terms of frequency and percentages. This showed the type and frequency of the strategy the learners taking part in the study mainly employed in their classes. It is worthy to note that the reliability and validity of the qualitative data were assessed and reported the acceptable level. The internal consistency of item responses and inter-rater consistency in scoring were achieved.

Procedure

Quantitative Data

As the preliminary step to the study and in line with the research purpose concerning an investigation of the effects of the four types of scaffolding referred to as Soft, Hard, Reciprocal, and Technology-mediated scaffolding labeled as Traditional and Virtual, a Preliminary English Test (PET) was given to the existing 100 students to screen out 80 students whose scores ranged one SD above and below the mean score. The students were then randomly assigned to four same-size groups of scaffolding namely soft, hard, reciprocal, and virtual; each one comprising of 20 members. Then, the participants of the four experimental groups received a pretest of reading comprehension and Reading Strategy Questionnaire. It should be noted that the validity of the questionnaire, the wording of the survey instrument, and the ease of the implementation of the procedures was examined by two experienced professors to avoid any ambiguity and if any final adjustments needed to be done. After that they received their specific treatments concerning reading comprehension development and strategy implication based on hard, soft, reciprocal, and virtual scaffolding. The treatment started and continued for 8 sessions; two sessions a week, which took 4 weeks and every session lasted 90 minutes in all groups.

In the experimental group (A) soft scaffolding techniques were implemented. In each session students were asked to read about a topic which required no technical knowledge. The subjects were selected from the students' course book. Soft scaffolds are dynamic, situation-specific aid provided by a teacher or peer to help with the learning process. Such scaffolding requires teachers to continuously diagnose learners' understandings and provide timely support based on student responses. In soft scaffolding, the teacher monitors the students' progress while engaged in a learning activity and intervenes when support or guidance is needed (Taguchi, et al., 2016). In this study the teacher allowed the students to ponder and raise their questions on the problematic issues. The teacher then took her time removing the problems by giving clear explanations and vivid examples. Further, the teacher walked around the class waiting for any possible question from the learners and was ready and well-equipped to help them out.

In the experimental group (B), hard scaffolding techniques were implemented. Hard scaffolds are static supports that can be anticipated and planned based upon typical student difficulties with a task. These support structures can be embedded within multimedia and hypermedia software to support students using software (McGee & Nelson, 2013). In this group the instructor used her prewired lesson plans and anticipated the possible problems to arise. In teaching the new vocabulary, she derived the students' attention to those words and expressions that were more challenging and thus demanding on the part of the learners in their reading passage ahead. Derivatives were also taught to the students asking them to develop new sentences or use their dictionaries. Structural notes supposed to pose ambiguity or difficulty were explained as she read the passage for comprehension. The researcher anticipated every problem and thus was ironed out before the learners raised their hands.

In the experimental group (C) reciprocal scaffolding techniques were implemented. Reciprocal scaffolding is a collaborative method in which at least two learners work together and learn from each other (Holton & Clark, 2006). Students were divided into 3 groups of 5 members. They were encouraged to read the texts and discuss the issues together. Students were advised to keep each other motivated. The researcher did not leave them on their own for a long time and joined the groups at times to monitor their cooperative work and progress. In joint work, students frequently used their dictionaries and sometimes hints and clues from other group members.

In the experimental group (D) virtual scaffolding techniques was implemented. Virtual scaffolding utilizes computer programs and software that provide structure and guidance. This replaces the teacher in this role. Interactive programs provide a basic scaffold for the students based on which they can build their knowledge and progress" (Yelland & Masters, 2007, p. 362). As to the virtual scaffolding experiment, precaution was taken in selecting the media and materials and candidates were under constant supervision of the researcher while they used and practiced via technological tools. It was also felt necessary by the researcher to make sure all the participants were able to use the tool they worked with appropriately.

In the present study, the researcher used *Telegram application* as one of the most applicable and accessible applications used for virtual scaffolding. At the start, the researcher made sure all the learners were connected via the device and form a group under an enticing title "Learn to Read English." All of the 20 students became members of the group and assigned their real names as their IDs. This application enabled the students to download and share any files of audio, video and texts. They could also share their own findings with other members. Besides the group chat, the students had the chance to enter secret or private conversations with their peers and share their experience. All four groups of the learners received instructions in terms of keeping records and diaries of their works and were trained to be familiar with the nature of most frequent strategies in reading comprehensions such as employing dictionaries, making use of

expressions and idioms. Meanwhile what the researchers were seeking for among the learners' reports were what learners did and the ways they employed to present more fruitful performance in reading comprehension. Therefore, all the learners were instructed to complete their records in which they reported their diaries as well as their home works and their learning experience reports. After finishing the eight-week-long treatment sessions, and in line with the research questions, a posttest of reading comprehension was administered to the study. Participants also received the questionnaire of reading strategy. The data gathered were put into SPSS version 25 and the results were reported. Each research question was checked against the findings. Then, the final findings were discussed against the similar previous findings in the literature and the results were presented.

Qualitative Data

The qualitative data were collected through learners' reports and teachers' observations. A checklist for application of scaffolding principles was used and the researchers observed and checked whether the principles of each sort of scaffolding were implemented in each experimental group appropriately. More importantly, the researcher recorded treatment sessions in order to assess the collected data more thoroughly. The data elicited from the checklists were presented in the frequency tables and percentage of occurrence different support, global, and problem-solving strategies were presented. The notes taken as well as the learners' reports were analyzed based on axial and open coding and then were presented. Finally, both quantitative and qualitative results were taken into consideration to come to a reliable and valid conclusion.

Data Analysis

The selection of the participants in this study was non-random, but dividing them to the experimental groups was random, therefore, the design for the quantitative section was a quasi-experimental one. Having pre and posttest also showed the quasi-experimental nature of this research. The present study enjoyed an embedded mixed methods design in which both quantitative and qualitative measures of data analysis were applied. Therefore, a triangulation of questionnaires, tests, teacher observations and notes, and portfolios (learners' reports) were employed both to collect the data and analyze. The quantitative dimension of the study included the statistical analysis related to students' reading progress and strategies' scores and qualitative analysis of the emerging strategies based on portfolio and teachers' observations and notes which elaborated and cross checked the qualitative results. Both qualitative and quantitative data analysis were employed in the present study. To analyze the data SPSS software (version 25) was used and each research question was checked against the findings. The data analysis of this study was both descriptive and inferential statistics. Descriptive statistics was used to calculate the mean and standard deviation of the piloted PET which was used for homogenizing participants. To do the inferential statistics, measures of one-way ANOVA and multivariate ANOVA (MANOVA) were used to analyze the data. A one-way analysis of variances was run to compare the hard, reciprocal, virtual and soft scaffolding groups' means on the posttest of reading comprehension, while a MANOVA was used to find the strategy development among all the learners in different groups. Regarding qualitative data analysis, the results of the classroom observation elicited from the checklists were tabulated in terms of frequency and percentages. This showed the type and frequency of the strategy the learners taking part in the study mainly employed in their classes. Likewise, based on the open/axial coding, the qualitative data in terms of strategy use in reading comprehension were classified and categorized in the frequency tables and were explained for each group. The prominent, successful strategies employed by the learners were also taken into consideration while presenting the explanations.

RESULTS

Concerning the first research question, based on the results displayed in Table 1 ($F(3, 76) =$

25.15, P = .613, partial eta squared = .498 representing a large effect size) it was concluded that there were significant differences among the means of the four groups on the reading posttest.

Table 1

One-Way ANOVA; Posttest of Reading by Groups

		Sum of Squares	df	Mean Square	F	Sig.
Posttest	Between Groups	1082.200	3	360.733	25.152	.000
	Within Groups	1090.000	76	14.342		
	Total	2172.200	79			

A-priori (planned) contrast was run to compare the overall mean of the traditional groups; i.e. hard, reciprocal and soft, with the virtual group. The following table displays the design of the contrast test.

Table 2

A-Priori Contrast Coefficients

	Group			
Contrast	Hard	Reciprocal	Virtual	Soft
1	1	1	-3	1

Concerning the second research questions, Table 4.3 displays the results of MANOVA. Based on these results (F (9, 218) = 135.84, p = .000, partial eta squared = .849 representing a large effect size) it was concluded that there were significant differences between the four groups' means on posttests of reading strategies. Thus, it was found that hard, soft, reciprocal, and virtual scaffolding had statistically significant effects on the development of reading strategies among Iranian EFL learners.

Table 3

Multivariate Tests; Posttests of Reading Strategies by Groups

	Effect	Value	F	df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.998	15231.464	3	74	.000	.998
	Wilks' Lambda	.002	15231.464	3	74	.000	.998
	Hotelling's Trace	617.492	15231.464	3	74	.000	.998
	Roy's Largest Root	617.492	15231.464	3	74	.000	.998
Group	Pillai's Trace	1.094	14.532	9	228	.000	.365
	Wilks' Lambda	.048	49.581	9	180.247	.000	.636
	Hotelling's Trace	16.824	135.841	9	218	.000	.849
	Roy's Largest Root	16.651	421.831	3	76	.000	.943

Concerning the third research question, a multivariate ANOVA (MANOVA) was run to compare the four groups' means on posttests of global, problem solving and supporting reading

strategies. Based on the results displayed in Table 4.4 it was concluded that the traditional groups (hard, soft, and reciprocal) (Overall Mean=33.66) significantly outperformed the virtual group (M = 30.40) on the posttest of reading comprehension (t (26) = 2.87, p = 008, r = .490) representing an almost large effect size. Based on these results it was concluded that there was a statistically significant difference among hard, soft, reciprocal, and virtual scaffolding regarding their effects on the reading skill of Iranian EFL learners.

Table 4
A-Priori Contrast Tests; Posttest of Reading by Groups

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
Posttest	Assume equal variances	1	9.80	2.933	3.341	76	.001
	Does not assume equal variances	1	9.80	3.406	2.877	26.132	.008

Concerning the third research question, based on the results displayed in Table 5,6, and 7 it was concluded that;

A: There were significant differences between the hard (M = 4.56), reciprocal (M = 3.01), virtual (M = 3.88) and soft (M = 3.19) groups' means on posttest of global strategy (F (3, 76) = 316.86, p = .000, partial eta squared = .926 representing a large effect size). The results of post-hoc comparison tests (Table 4.12) indicated that;

A1: The hard-scaffolding group (M = 4.56) significantly outperformed the reciprocal group (M = 3.01) on the posttest of global strategy (Mean Difference = 1.55, p = .000).

A2: The hard-scaffolding group (M = 4.56) significantly outperformed the virtual group (M = 3.88) on the posttest of global strategy (Mean Difference = .67, p = .000).

A3: The hard-scaffolding group (M = 4.56) significantly outperformed the soft group (M = 3.19) on the posttest of global strategy (Mean Difference = 1.37, p = .000).

A4: The virtual scaffolding group (M = 3.88) significantly outperformed the reciprocal group (M = 3.01) on the posttest of global strategy (Mean Difference = .87, p = .000).

A5: The virtual scaffolding group (M = 3.88) significantly outperformed the soft group (M = 3.19) on the posttest of global strategy (Mean Difference = .17, p = .000).

Table 5
Descriptive Statistics; Posttests of Reading Strategies by Groups

Dependent Variable	Group	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Post Global	Hard	4.562	.040	4.482	4.641
	Reciprocal	3.015	.040	2.936	3.095
	Virtual	3.888	.040	3.809	3.968
	Soft	3.192	.040	3.113	3.271
Post Problem	Hard	4.106	.109	3.889	4.324
	Reciprocal	2.544	.109	2.326	2.761
	Virtual	3.794	.109	3.576	4.011
	Soft	3.131	.109	2.914	3.349
Post Support	Hard	4.444	.044	4.356	4.533
	Reciprocal	3.000	.044	2.912	3.088
	Virtual	3.883	.044	3.795	3.972
	Soft	3.172	.044	3.084	3.261

A6: There was not any significant difference between soft (M = 3.19) and reciprocal (M = 3.01) scaffolding groups' means on the posttest of global strategy (Mean Difference = .18, p = .051).

B: There were significant differences between the hard (M = 4.10), reciprocal (M = 2.54), virtual (M = 3.79) and soft (M = 3.13) groups' means on posttest of problem solving strategy (F (3, 76) = 40.69, p = .000, partial eta squared = .616 representing a large effect size). The results of post-hoc comparison tests (Table 7) indicated that;

B1: The hard-scaffolding group (M = 4.10) significantly outperformed the reciprocal group (M = 2.54) on the posttest of problem-solving strategy (Mean Difference = 1.56, p = .000).

B2: There was not any significant difference between hard (M = 4.10) and virtual (M = 3.79) scaffolding groups' means on the posttest of problem-solving strategy (Mean Difference =.31, p=.334).

B3: The hard-scaffolding group (M=4.10) significantly outperformed the soft group (M=3.13) on the posttest of problem-solving strategy (Mean Difference = .98, p = .000).

B4: The virtual scaffolding group (M=3.79) significantly outperformed the reciprocal group (M=2.54) on the posttest of problem-solving strategy (Mean Difference =1.25, p=.000).

B5: The virtual scaffolding group (M = 3.79) significantly outperformed the soft group (M = 3.13) on the posttest of problem-solving strategy (Mean Difference = .66, p = .000).

B6: The soft scaffolding group (M = 3.13) significantly outperformed the reciprocal group (M = 2.54) on the posttest of problem-solving strategy (Mean Difference = .59, p = .003).

Table 6

Tests of Between-Subjects Effects; Posttests of Reading Strategies by Groups

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Group	Post Global	29.983	3	9.994	316.683	.000	.926
	Post Problem	29.181	3	9.727	40.695	.000	.616
	Post Support	26.677	3	8.892	226.298	.000	.899
Error	Post Global	2.399	76	.032			
	Post Problem	18.166	76	.239			
	Post Support	2.986	76	.039			
Total	Post Global	1106.621	80				
	Post Problem	968.750	80				
	Post Support	1080.914	80				

C: There were significant differences between the hard (M = 4.44), reciprocal (M = 3), virtual (M = 3.88) and soft (M = 3.17) groups' means on posttest of supporting strategy (F (3, 76) = 226.29, p = .899, partial eta squared = .616 representing a large effect size). The results of post-hoc comparison tests (Table 4.7) indicated that;

C1: The hard-scaffolding group (M = 4.44) significantly outperformed the reciprocal group (M = 3) on the posttest of supporting strategy (Mean Difference = 1.44, p = .000).

C2: The hard-scaffolding group (M = 4.44) significantly outperformed the virtual group (M = 3.88) on the posttest of supporting strategy (Mean Difference = .56, p = .000).

C3: The hard-scaffolding group (M = 4.44) significantly outperformed the soft group (M = 3.14) on the posttest of supporting strategy (Mean Difference = 1.27, p = .000).

C4: The virtual scaffolding group (M=3.88) significantly outperformed the reciprocal group (M=3) on the posttest of supporting strategy (Mean Difference=.88, p=.000).

C5: The virtual scaffolding group (M=3.88) significantly outperformed the soft group (M=3.17) on the posttest of supporting strategy (Mean Difference=71, p=.000).

C6: The soft scaffolding group (M=3.17) significantly outperformed the reciprocal group (M=3) on the posttest of supporting strategy (Mean Difference=.17, p=.034)

Table 7

Multiple Comparisons; Posttests of Reading Strategies by Groups

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Global	Hard	Reciprocal	1.55*	.063	.000	1.37	1.72
		Virtual	.67*	.048	.000	.54	.81
		Soft	1.37*	.054	.000	1.22	1.52
	Virtual	Reciprocal	.87*	.059	.000	.71	1.04
		Soft	.70*	.049	.000	.56	.83
	Soft	Reciprocal	.18	.064	.051	.00	.35
Problem	Hard	Reciprocal	1.56*	.208	.000	.99	2.14
		Virtual	.31	.161	.334	-.15	.78
		Soft	.98*	.162	.000	.51	1.44
	Virtual	Reciprocal	1.25*	.147	.000	.83	1.67
		Soft	.66*	.068	.000	.47	.85
	Soft	Reciprocal	.59*	.148	.003	.16	1.01
Support	Hard	Reciprocal	1.44*	.067	.000	1.26	1.63
		Virtual	.56*	.066	.000	.38	.75
		Soft	1.27*	.063	.000	1.10	1.45
	Virtual	Reciprocal	.88*	.062	.000	.71	1.06
		Soft	.71*	.058	.000	.55	.87
	Soft	Reciprocal	.17*	.059	.035	.01	.34

*. The mean difference is significant at the .05 level.

The last research question aimed at finding learners' perceptions about scaffolding treatments. To answer this question which enjoyed a qualitative nature, learners' self-reports and diaries (portfolios) were analyzed and the most notable perceptions of the learners

in the four groups of the study (experiencing hard, soft, reciprocal and virtual scaffolding treatments) concerning the process of learning they had experienced were extracted.

Table 8

Themes and Codes of Learners' Perceptions Derived out of Self-Reports (Portfolios)

Themes	Open Codes	Axial Codes		Frequency
scaffolding	Hard	1.	Our difficulties with different tasks were typically anticipated by the teacher.	25
		2.	There was always a plan for us to deal with our grammatical, lexical, and even comprehension problems. This helped us to feel in ease in the classroom context or when we used the social media, software, and applications which were intended to help us through the groups which we had joined.	23
		3.	The supports the students were provided with were almost planned in advance based upon students' needs and wants.	20
		4.	The hyperlinks and databases which were introduced by both our teacher and the classmates were user friendly and they themselves had used them before.	17
		5.	Sometimes the conceptual links between information in the database and technology provided the students with novelty and encouraged them to delve into the new concepts to read and learn more.	15
	Reciprocal	1.	Peer interactions were truly helpful in the language classroom. This not only created a friendly atmosphere but created a situation which paved the ground for more learning and less stress.	29
		2.	We always knew that in case we have a problem with the text or a part of it one of our friends will find a way for it.	25
		3.	We put aside the fear of being blamed for not knowing something and dare to ask questions when we had a problem.	18
		4.	We also learned to be polite while rejecting a classmate's idea or his/ her understanding of the text.	15
		5.	In a lot of cases we learned reading strategies from each other. More capable classmates were very eager in order to help others solve a problem or perform a task that seemed difficult for them to solve on their own. It was a good feeling when we were corrected so that we read and speak more accurately.	13
	Soft	1.	In each session students read about just one topic. This was really good and enjoyable, because they knew what the purpose of the class would be.	27
		2.	Everything was clear in the class and the teacher provided us with explanations whenever needed.	25
		3.	The teacher gave us the opportunity to think about the text and raise questions on the problematic issues.	21
		4.	The teacher helped us remove the problems by giving clear explanations and vivid examples.	18
		5.	The teacher was always ready and well-equipped to help the students in a friendly manner.	16
		6.	For the students who were not patient enough and had a bit of stress while reading and understanding the texts, this method was highly useful, as they had always the teacher's support.	13
		7.	Even the weakest students of the class could learn how to read different texts more successfully in this class.	10
	Vi rtu	1.	We had to increase our computer skills and learn different concepts such as typing and word office skills.	26

2.	We had to develop internet searching skills, learning from multimedia, selecting information, diagnosing real information from the fake notions, and generally being more technology wise.	23
3.	We could learn how to search for and find special websites teaching reading comprehension, grammar, and writing.	21
4.	The students learned that they could solve their problems by the help of on-line websites anytime, even at midnight.	19
5.	The students could find a good number of texts similar to the one devised in the course book in the teaching websites; some of these websites even present films and animations accompanied with the texts.	17
6.	Interactive programs provide a basic scaffold for the students based on which they can build their knowledge and progress	15
7.	The Telegram Application which was used in this group enabled the students to download and share any files of audio, video, and texts. Of course, the media, materials, and candidates were under constant teacher supervision while they used and practiced via technological tools.	10

Table 4.9 below shows the main concepts proposed by the learners of the four scaffolding groups concerning their experiences under being instructed through their respective scaffolding type of instruction.

Table 9

Main Points of Learners' Thoughts and Ideas Concerning Scaffolding Types

N	Groups	Main points of Learners' Thoughts and Ideas
1	Hard	High classroom interaction among class members in a friendly manner Anticipation of learners' difficulties with different tasks, needs and wants Planning for learners' grammatical, lexical, and even comprehension problems. Availability of user-friendly technologies; social media, software, and applications Availability of hyperlinks and databases introduced by teacher and classmates
2	Reciprocal	Helpful peer interactions in the language classroom. A friendly atmosphere which paves the ground for more learning and less stress Cooperative learning atmosphere and less coopetition Putting aside the fear of being blamed for not knowing something Encouraging leaners to ask questions when a problem is felt Learning to be polite while rejecting other people's ideas Learning reading strategies from each other
3	Soft	Teacher feedback and the scaffolding played a significant role in the learners' development Continuous diagnosis of learners' understandings and providing timely support based on student responses. Teacher's continuous monitoring of the students' progress Presenting the required feedback continuously Encouraging students Feeling comfortable in the classroom and benefiting from the teacher's helps and supports. A teacher-oriented model

4	Virtual	The key role of computer programs and software in the teaching process Minimization of teacher's role and the peers' role in the virtual scaffolding system Immediate feedback provided for the learner by multimedia Instructive programs and tutorials which are provided by interactive web-links Emergence of a specific type of scaffolding labeled as contingent scaffolding Development of computer skills and internet searching skills, and generally being more technology wise Solving problems by the help of on-line websites anytime, anywhere

DISCUSSIONS

In the quantitative phase of the study, the results of data analysis revealed that different forms of scaffolding including hard, soft, reciprocal, and virtual scaffolding had a significant effect on the English language reading development of Iranian EFL learners. However, based on the results of the ANOVA test, it was revealed that the hard-scaffolding group had the highest mean on the posttest of reading. This was followed by the reciprocal, virtual and soft scaffolding groups. Likewise, it was concluded that the overall traditional groups significantly outperformed the virtual group on the posttest of reading. These findings are in line with the findings of other research in the related literature. The findings are in line with another study conducted by Graves and Graves (2003) which revealed that reciprocal and hard scaffolding successfully paved the way for the reading development of the learners. However, hard scaffolding enjoyed a better attraction for the learners. Likewise, the results are in line with Amro and Dabbagh's (2020) asserting that second language development of learners was made possible through using primary language support as scaffolds in a computer-based intervention. The present study also found that all the scaffolding types had significant effects on the development of reading comprehension among Iranian EFL learners, though the amount of effect pertained to each scaffolding type differs. In this regard, the study results can take support from Poorahmadi's (2009) study on the effect of employing scaffolding strategies and classroom tasks in teaching reading comprehension, Attarzadeh's (2011) study on the effect of scaffolding on reading comprehension of various text modes on Iranian EFL learners with different proficiency levels, and Rahimi and Tahmasebi's (2011) study on the effects of private speech and scaffolding on the Iranian EFL learners reading comprehension. The present study findings in terms of the effect of virtual scaffolding can also take support from Auer's (2016) study on scaffolding foreign language learners' reading strategies using tablet computers at two secondary schools in Denmark. This study supports the idea that electronic devices and software can promote L2 leaners' interest in learning. Also, the study can take support from Brevik's (2019) study asserting that daily use of strategies can significantly improve reading comprehension strategy development of EFL learners.

The results of this work proved that not only traditional and virtual scaffolding treatments had different effects on the development of global, problem solving, and supporting reading strategies among Iranian EFL learners, the hard-scaffolding group had the highest use of reading strategies followed by the virtual scaffolding group. Nevertheless, reciprocal and soft scaffolding groups similarly had less use of reading strategies. It seems that both hard and virtual scaffolding types have helped the development of successful readers. In this regard, the present findings are in line with Tsai, Ernst, and Talley's (2010) study, which proved that skilled readers could employ reading comprehension strategies more appropriately than the less skilled readers. In the virtual scaffolding group teacher's role and the peers' role, the last research question has been highly minimized. Computer programs and software that provide structure and guidance for the learners have replaced the teacher and play the crucial role in the teaching

process. The immediate feedback the learner can receive, instructive programs and tutorials provided by interactive web-links, and contingent scaffolding presented by different web sites have been the most noteworthy roles in the EFL learners' reading strategy and reading development. Reciprocal scaffolding's positive points from the learners' perspective were the presence of peer scaffolding, sharing strategies, and collaborative learning supported by peer interactions. Such notions found in the preset study are in line with Riazi and Rezaii (2011). They proved the significant effects of both teacher and peer scaffolding behaviours on EFL students' writing improvement and also in line with Khodamoradi, Iravani, and Jafarigohar's (2013) study on the effect of teacher's scaffolding and peers' collaborative dialogue on the acquisition of English tenses in the zone of proximal development.

The soft scaffolding group enjoyed high use of teacher feedback, explicit instructions of the teacher, and teacher's continuous monitoring. Such notions have been supported by the research on the role of teacher-scaffolding in Iranian EFL learners' intentional and incidental grammar learning (Taherkhani & Mahmoodi, 2015) and the effect of teacher's scaffolding on the acquisition of English tenses in the zone of proximal development (Khodamoradi, Iravani, & Jafarigohar, 2013). The prominent features of virtual scaffolding from the point of view of the learners were minimization of teacher's role and the peers' role in the L2 classroom for the sake of immediate feedback the learner could receive through instructive programs and tutorials provided by interactive web-links. This finding is in line with Kim et al.'s (2006) study on virtual scaffolding which found that learner motivation can be increased through a virtual peer.

CONCLUSION

The findings of the study revealed that hard scaffolding enjoyed the highest mean on the posttest of reading. The reciprocal scaffolding group followed this. However, the third position was achieved by the virtual scaffolding group, and the soft scaffolding group received the last place in ranking. The findings also proved that employing scaffolding types, especially traditional types of scaffolding such as hard and reciprocal ones can increase the L2 reading comprehension ability of the EFL. Therefore, complex and common scaffolding can be considered successful in helping learners improve their reading in the second language. Based on the literature on scaffolding and its applications, employing scaffolding strategies could promote second language development in general and L2 reading development, Hence, it could be concluded that findings of the current study extended earlier understandings of scaffolding in an EFL environment and could contribute to the advancement of future courses in terms of their scaffolding pedagogical aspects. In terms of reading strategies, the results revealed that not only traditional and virtual scaffolding treatments had different effects on the development of global, problem solving, and supporting reading strategies among Iranian EFL learners, the hard scaffolding group (as a traditional scaffolding group) had the highest use of reading strategies followed by the virtual scaffolding group. Nevertheless, reciprocal and soft scaffolding groups similarly had less use of reading strategies. The present findings on the ground of the success and priority of hard and virtual scaffolding in developing and making use of global, problem solving, and supporting reading strategies can take support from a lot of previous studies in the SLA research (Afflerbach & Cho, 2010; Anderson, 2019; Tsai et al., 2010; Deshpande, 2016; Kargar, 2013; Ruiz de Zarobe & Zenotz, 2018). Reciprocal scaffolding was also found to have proved successful for the low-achieving learners in terms of strategy development.

In terms of learners' thoughts and views concerning learning under scaffolding types, the data analysis results revealed that for the learners in the complex scaffolding group, technology, conceptual links, and prediction of learners' likely problems have been the most vital points. However, in the reciprocal scaffolding group, the role of peer scaffolding, sharing strategies, collaborative learning, and peer interactions have been significant.

Meanwhile, in the soft scaffolding group teacher feedback, explicit instructions, and teacher's continuous monitoring of the students played the most significant roles in the EFL learners' reading strategy and reading development. It was also revealed that in the virtual scaffolding group teacher's position and the peers' had been highly minimized for the computer programs and software which can provide immediate feedback the learner can receive, instructive programs and tutorials provided by interactive web-links, and contingent scaffolding presented by different web sites. Finally, it was concluded that in the present study, the role of technology, conceptual links, and prediction of learners' likely problems have been strong for the learners in the hard-scaffolding group. However, in the reciprocal scaffolding group, the role of peer scaffolding, sharing strategies, presenting ideas, collaborative learning, and peer interactions have been strong for the learners. Meanwhile, in the soft scaffolding group teacher feedback, scaffolding and explicit explanations provided by the teacher, teacher's continuous monitoring of and supporting the students, and learner encouragement have played the most significant roles in the EFL learners' reading strategy and reading development.

According to the results of the present study, some implications for teaching and learning English through scaffolding can be suggested. Second language teachers could employ different forms of scaffolding, especially the hard-scaffolding type to make the learners more aware of what they are dealing with. Mackey and Sachs (2012), within the framework of SLA pay attention to the role scaffolding and interactional feedback play in L2 development. Although they do not directly use the terms hard, soft, or virtual scaffolding, they emphasize the importance of presence of scaffolding and increasing learners' awareness in prompting learners to focus on the language forms and meanings. English teachers and learners could employ different types scaffolding, especially hard scaffolding in an attempt to solve their linguistic and meta-linguistic problems meaningfully (Sato, 2014), and then notice the gaps, awareness of a mismatch between input they receive and their current learning. This way the classroom interactions could be enriched and would help subsequent L2 development of the learners. Materials developers in the ELT domain also could employ the findings of the present study and those of the similar ones to present tasks in which learners' awareness toward learning is enhanced. Such tasks may help the learners move towards self-correction, autonomy, and meaningful learning.

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