



Effect of Scaffolding in a Cooperative Learning Condition on Undergraduate EFL Learners' Vocabulary Retention

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ARTICLE INFO

Article history:

Received 26 May 2016
Revised 27 August 2016
Accepted 19 October 2016
Published 14 November 2016

Keywords:

Scaffolding
Cooperative and Individual Learning
Vocabulary Retention and Recall

ABSTRACT

In an attempt to facilitate vocabulary retention, this study investigated the effect of scaffolding in a cooperative learning condition on Iranian undergraduate students' vocabulary learning. The paired-samples experimental design was used to study 24 students who had registered for the Thematic Conversation course at Kosar University of Bojnord. Thirty topics were taught from the book "For and Against" by Alexander (1986). The first fifteen passages were collaboratively discussed by the students and the teacher read each text aloud and elaborated upon the points raised by the students. The second fifteen passages were individually reviewed by the students. The teacher just read each text aloud and answered the questions raised by the students. Then, each student was required to give a short presentation. After the treatment, the subjects were given a vocabulary test. The reliability of the two 30-item tests was estimated at 0.74 and 0.79 respectively through the Kuder-Richardson (KR-21) formula. The results of the t-test indicated that the differences between the two conditions were statistically significant. That is, scaffolding in a cooperative learning condition was more effective. This implies that teachers, learners, and material developers can use this strategy to facilitate vocabulary retention.

Introduction

There are some higher-order thinking skills like analysis, evaluation, and creation (Bloom, 1956) that students would not be able to achieve without their teachers' assistance. Therefore, teachers have always been trying to use different kinds of instructional scaffolding in their teaching. According to Van de Pol, Volman and Beishuizen (2010, p. 274), scaffolding refers to "support given by a teacher to a student when performing a task that the student might otherwise not be able to accomplish." It is the temporary support given to students individually or collectively to complete a task they cannot do without guidance (Graves, Watts, & Graves, 1994). Like physical scaffolding, this support is incrementally removed when it is no longer necessary, and the teacher gradually shifts more responsibility to the learners (Poorahmadi, 2009). The supportive strategies may include posing questions, giving feedback, using examples, and offering explanations.

In this study, scaffolding, as a general instructional strategy, refers to the supportive strategies that the researcher (teacher) used to bridge the learning gaps in reading comprehension by moving students progressively towards higher levels of comprehension and greater independence. Scaffolding as an essential element of effective teaching is often used to bridge the distance between what students know and what they are expected to know. The teacher might use it to move students' learning and understanding one step forward or to reduce the negative emotions that students may experience while attempting to complete a difficult task without assistance.

Most of the following studies provide enough support that scaffolding is effective in both reading comprehension and vocabulary learning, either in cooperative or individual learning. Cooperative learning, based on the constructivist

principles of Piaget (1960) and Vygotsky (1978), emphasizes interaction with others for cognitive development. This study investigates the effect of scaffolding in a cooperative learning condition versus individual learning condition based on Vygotsky's (1978) Zone of Proximal Development (ZPD) in which cooperation with more knowledgeable peers is considered to help the learner move to a higher level. The following ZPD diagram clearly indicates how to support a learner when they are at different stages of their learning. In the middle circle, representing the ZPD, learners cannot complete tasks unaided, but can complete them with guidance.

The assumption that scaffolding enables learners to improve their achievements depends on factors like students' level and the task difficulty. This study took the proficiency level and background knowledge into consideration while developing scaffolding for each reading passage to attune it to the needs of the learners.

According to Donovan and Smolkin (2002), scaffolding is more necessary when a task is difficult and students' ability is lower. Since, based on the students' performance on the first pretest ($M = 8.75$ out of 30) and the second pretest ($M = 8.78$ out of 30), the passages used in this research proved to be difficult and the participants were not proficient enough to understand the reading texts, they needed scaffolding to understand the texts before starting any conversation related to the reading passages. Based on the findings from previous studies, the researcher investigates the effect of scaffolding on vocabulary retention in cooperative and individual learning conditions.

It is assumed that through reading activities, before any conversations, students also learn and retain new words. Scaffolding can take place at different levels. According to Clark

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and Graves (2005, p. 572), there are three types of scaffolding including (1) "moment-to-moment verbal scaffolding" in which the teacher helps individual students appropriately by asking questions and giving feedback on their responses to support the learning process, (2) "instructional frameworks that foster content learning" in which the teacher designs the lesson in a way to optimally enhance the learners' comprehension, (3) and "instructional procedures for teaching reading comprehension strategies" in which learners are gradually helped to become independent readers through direct explanations of reading comprehension strategies.

According to Alexander (1986), just setting a topic and then attempting to stimulate a class discussion by asking questions or suggesting ideas is not enough for a conversation class because it is difficult for the teacher to predict the course of the conversation lesson over which s/he has little control. Since it tends to be random and unprogrammed, time is usually frittered away. The conversation passages from the book "For and Against" by Alexander (1986) meet most of the problems. The passages enable the teacher to manipulate the program according to the needs of his class, predict, to some extent, the course of each lesson, and ensure that the students will have a source for ideas suited to their requirements.

This study compares the effect of scaffolding on Iranian undergraduate EFL students' vocabulary retention at the individual and small group levels. This is an attempt to examine vocabulary learning in the thematic conversation classroom in which the students have to, first, comprehend the reading passages related to the conversation topics through scaffolding and then present and discuss orally what they are for or against.

Review of Literature

As pointed out by some researchers (Saragi, Nation, & Meister, 1978; Pulido, 2004), reading substantially affects and contributes to incidental vocabulary learning implying that improving reading comprehension ability will lead to an increase in vocabulary knowledge and retention.

The application of scaffolding in reading instruction has already been examined by authors like Safadi and Rababah (2012), Attarzadeh (2011), Pishghadam and Ghadiri (2011), and Poorahmadi (2009). The findings indicate that scaffolding significantly improves the students' reading comprehension. However, the most appropriate scaffolds are those added to our instruction in a cooperative learning condition. Jalilifar (2009), Law (2010), and Johnson, Johnson and Holubec (2004), refer to its positive effect on promoting better academic achievement. Stockdale and Williams (2004) finds that it significantly affects the lower ability learners and minimally affects the higher ability learners. However, Shaaban (2006) indicates that cooperative learning does not have any significant or positive effect on reading comprehension and vocabulary learning in small-groups versus whole class instruction. He points out that its effectiveness depends on contextual variables like treatment duration, learners' interaction and ability levels, attitude, gender, and motivation.

Attarzadeh (2011) studied the effect of scaffolding on 180 Iranian EFL learners' reading comprehension of diverse text types from a constructivist perspective. Three experimental groups with different levels of proficiency (30 elementary, 30 intermediate, and 30 advanced readers), were exposed to supportive strategies through constructivist-interactive models of learning in which the participants first individually and then collaboratively discussed the meaning of the passages in small groups. Three control groups with different levels of proficiency (30 elementary, 30 intermediate, and 30 advanced readers) were taught individually. The passages were narrative, argumentative, descriptive, and explanatory. The results indicated that scaffolding had a positive effect on reading comprehension, especially on intermediate learners' comprehension of narrative genre texts.

Pishghadam and Ghadiri (2011) investigated the effect of symmetrical (the Piagetian view that interaction with others is conducive to cognitive development when the cognitive and social distance between peers is relatively little) and asymmetrical (the Vygotskian perspective that interaction with more knowledgeable peers can lead to faster cognitive development) scaffolding on 52 students' reading comprehension. The researchers used 8 short passages. Both groups completed the tasks cooperatively under the guidance of the same teacher. The students discussed and helped each other while reading the text. The results showed that cooperative reading is helpful; however, asymmetrical scaffolding is more effective than symmetrical scaffolding.

In their quasi-experimental design study, Safadi and Rababah (2012) found that scaffolding enhances reading comprehension skills like vocabulary learning, finding main ideas, drawing inferences, and critical thinking. In addition, in her experimental study on 130 Iranian EFL female freshmen students, Poorahmadi (2009) found that scaffolding strongly improves their reading comprehension.

Wachyuni (2015) studied the effect of scaffolding and cooperative learning on reading comprehension and vocabulary knowledge in EFL by comparing three different groups: scaffolding individual learning, scaffolding cooperative learning, and individual learning without scaffolding (dictionaries allowed). His study revealed no significant differences between the groups in terms of vocabulary gain. That is, vocabulary gain was not influenced by individual or cooperative scaffolding. In terms of reading comprehension, the students who had received individual or cooperative scaffolding outperformed those who had not; however, those who had worked individually had a better performance than those who had worked in small groups. Also, the lower level students benefited relatively more than the higher level ones in reading comprehension. In the cooperative learning condition, there was a strong relationship between reading comprehension and attitudinal factors, but not vocabulary gain.

One skill that needs extra attention at the university level in Iran is reading comprehension in English as a foreign Language (EFL). As pointed out by Wachyuni (2015), vocabulary knowledge is an integral part of reading comprehension which is crucial to success in academic achievement. According to Myers and Palmer (2002) and Snow (2002), comprehension includes making inferences, predicting, getting the main ideas, and summarizing. As Grabe and Stoller (2002) points out, text comprehension is the key to students' success in their academic achievement because they have to read some books and articles in English. Therefore, finding strategies that can help students comprehend the genre of academic texts in English is highly important. In this study, the learners had to read the text and based on their comprehension offer their arguments and counter-arguments in their oral discussion.

Research question

This study addressed the following research question:

Does scaffolding in a cooperative learning condition affect undergraduate EFL learners' vocabulary retention?

Research hypothesis

In keeping with the above-mentioned research question, the following null hypothesis was formulated:

Ho. Scaffolding in a cooperative learning condition does not significantly affect undergraduate EFL learners' vocabulary retention.

Participants and Research Design

The participants of the study included 24 female Iranian undergraduate EFL learners at Kosar University of Bojnord KUB, North Khorasan, Iran. Persian, Turkish, and

Kurdish were the native language of 17, 4, and 3 of them respectively. The Thematic Conversation Course was compulsory for the students and they naturally had to attend the class regularly. It is a two-credit course convened 16 sessions in a semester. However, due to the Persian New Year and some other official holidays, the whole process took seven months beginning from November 14, 2014 to June 15, 2015.

There was only one class. Therefore, due to the existing limitations, there was no randomization. Obviously, this study was limited to a relatively small sample by time constraints, and a fuller study might modify the findings in various ways. That is why the experimental paired-samples design was used in this study. This design is a powerful method that allows each sample to act as its own control. The means of data from the two related samples with and without the intervention (scaffolding in a cooperative learning condition) on the same subjects were compared.

Materials and Instruments

The materials used in this study included thirty topics from the book "For and Against" by Alexander (1986). According to the author of the book, this book is primarily intended for oral practice, but it can be put to a variety of other uses. It provides material which can be used for aural/oral practice, reading comprehension, and class discussion or debate.

"For and Against" consists of thirty argumentative essays which always appear on the left-hand page. The essays, referred to as source material in this study, cover a wide range of subjects of general interest. Each essay includes approximately 500 words and argues in favor of a proposition. The essays are not academic. They are informal and conversational in style. The argument is often deliberately provocative and bigoted to motivate the students and spark off a spontaneous debate in the classroom. The top half of each right-hand page consists of a list of numbered "key words" and notes summarizing the argument put forward in the essay and the lower half consists of "key words" and notes summarizing the counter-argument. These help the students when they are speaking impromptu.

Prior to the study, a 30-item researcher-made vocabulary pretest was administered to the subjects in the first phase and a 30-item researcher-made vocabulary pretest was administered to the same subjects in the second phase to make sure that they didn't know all the target words at the outset. Then, the items in the pretests were rearranged and used as the post-tests (15 items: fill in the blanks with the words given and 30 items in which participants should use their own words to fill the gaps). The time allocation for each test was 30 minutes. The reliability of the two tests was estimated at 0.74 and 0.79 respectively through the KR-21 formula.

Procedure

In both phases of the study (condition 1 and 2), before beginning the thematic conversation, the students had 10 minutes to review the target text and ask questions while the teacher walked around in the classroom and answered the questions. The students worked on the texts in small groups cooperatively in condition 1 (C1) and individually in condition 2 (C2). Then, the teacher read the text aloud and used different scaffolding strategies to support the students' comprehension in five minutes. As recommended by the author of the book (Alexander, 1986), the teacher read each passage and stopped at convenient points to explain unfamiliar words and constructions. Rather than give direct explanations, he tried to elicit as much information as possible from the students. Explanations were given entirely in English. Translation into the students' mother-tongue, on occasion, was used as a last resort. After ensuring that the students understand the text completely, the teacher proceeded to the next part of the lesson. The

students read the text silently while the teacher was going through it.

The book "For and Against" by Alexander (1986) includes 30 passages. Two passages were taught each session in half an hour (each passage in 15 minutes). That is, after a 15 minute reading comprehension practice, the students discussed the controversial issue raised in each text orally for half an hour. Fifteen passages (1-15) were taught in C1 and 15 passages were taught in C2. While answering the questions and reading the target texts aloud, the researcher tried to connect the learners' background knowledge to new learning as an important scaffolding strategy. To support students during independent work time, the researcher urged small group work in C1 and individual work in C2. The researcher was aware not to spoon feed the students by taking away all the challenges that the target texts presented.

After providing the subjects with some introductory information about the objectives of the course in C1, a 30-item pretest (15 items: fill in the blanks with the words given and 30 items in which participants should use their own words to fill the gaps) was administered to the subjects to assess their degree of familiarity with the target words in the first session. In C2, a 30-item pretest (15 items: fill in the blanks with the words given and 15 items in which participants should use their own words to fill the gaps) was administered to the subjects before the treatment. The target texts in both conditions were taught in 15 sessions and each session lasted one and a half hour once in a week. In one condition the students worked individually and in the other condition they worked cooperatively for ten minutes on each text. They asked the teacher to explain and clarify the difficult parts they did not understand before the oral presentation and discussion.

The items in both pretests were rearranged and used as posttests to reduce the test familiarity effect as much as possible. Each correct answer received one point and there was no penalty for the wrong answers. The learners didn't know anything about the research. The collected data were organized and submitted to statistical analysis.

Statistical Analysis and Results

After gathering the data, the results were subjected to a series of statistical analysis to compare the mean scores of the two conditions on the posttests. As soon as the treatment was over in each phase, the researcher conducted the posttest. The version 19 of Social Package for Statistical Analysis (SPSS) was used to analyze the data through paired-samples t-test to check whether there existed any statistically meaningful and significant difference between the means of the two conditions. The following Tables indicate the summary of the statistical analysis used in this study.

Since normally distributed data is a requirement of the paired-samples t-test, the Kolmogorov-Smirnov test was applied to test the hypothesis that the distribution of data is normal. As indicated in Tables 1, 2, 3, and 2, since the Asymp. Sig. is not statistically significant, normality fails to be rejected. This suggests that the paired-samples t-test which assumes normality can be safely used.

Table 1
One-Sample Kolmogorov-Smirnov Test for Pretest 1

Pretest	N	M	SD	Asymp. Sig. (2-tailed)
Pretest1	24	8.75	1.29	0.57

Results for the Kolmogorov-Smirnov test for normality indicates that the score distribution in Pretest1 does not deviate significantly from a normal distribution ($SD = 1.29, p = 0.57$).

Table 2
One-Sample Kolmogorov-Smirnov Test for Pretest 2

Pretest	N	M	SD	Asymp. Sig. (2-tailed)
Pretest 2	24	8.87	1.42	0.56

Results for the Kolmogorov-Smirnov test for normality indicates that the score distribution in Pretest 2 does not deviate significantly from a normal distribution ($SD = 1.42, p = 0.57$).

Table 3
One-Sample Kolmogorov-Smirnov Test for Condition 1

Condition	N	M	SD	Asymp. Sig. (2-tailed)
C1	24	23.45	2.34	0.47

Results for the Kolmogorov-Smirnov test for normality indicates that the score distribution in C1 does not deviate significantly from a normal distribution ($SD = 2.34, p = 0.47$).

Table 4
One-Sample Kolmogorov-Smirnov Test for Condition 2

Condition	N	M	SD	Asymp. Sig. (2-tailed)
C2	24	19.45	2.34	0.78

Results for the Kolmogorov-Smirnov test for normality indicates that the score distribution in C2 does not deviate significantly from a normal distribution ($SD = 2.34, p = 0.78$).

Table 5
The paired samples t-test for the Pretest 1 and Pretest 2

Pretests	N	M	SD	df	t	Sig.
Pretest 1	24	8.75	1.29	23	-0.47	0.64
Pretest 2	24	8.87	1.42			

The paired samples t-test was conducted to compare the possible differences between the two conditions before the treatment As indicated in Table 5, there was no significant differences in the scores for Pretest 1 ($M= 8.75, SD= 1.29$) and Pretest 2 [$M= 8.87, SD= 1.42$]; $t(23) = -0.47, p > 0.5$. Since the p-value is bigger than 0.05, it can be concluded that there is no statistically significant difference between the means of the two groups.

Table 6
The paired samples t-test for the C1 and C2

Conditions	N	M	SD	df	t	Sig.
C1	24	23.45	2.34	23	18.43	0.000*
C2	24	19.45	2.34			

*Sig. $p < .05$

The paired samples t-test was conducted immediately after the treatment to compare the effect of scaffolding in a cooperative learning condition (C1) and an individual learning condition (C2) on Iranian undergraduate EFL learners' retention and recall. As indicated in Table 6, there was a significant difference in the scores for C1 ($M= 23.45, SD= 2.34$) and C2 [$M= 19.45, SD= 2.34$]; $t(23) = 18.43, p < 0.5$. The mean decrease in the scores was 4.00 with a 95% confidence interval ranging from 3.55 to 4.44.

Since the p-value is less than .05, the null hypothesis (Scaffolding in a cooperative learning condition does not significantly affect undergraduate EFL learners' vocabulary retention) is rejected. It can be concluded that there is a statistically significant difference between the two condition means. That is, the differences between the two condition means are probably due to the scaffolding in a cooperative learning condition. Accordingly, the cooperative learning treatment employed in this study was found to be more effective than the individual learning treatment.

Discussion

This study was an attempt to investigate the effect of scaffolding in a cooperative learning condition on undergraduate EFL learners' vocabulary retention. The results of the study suggest that scaffolding in a cooperative learning condition is more effective than scaffolding in an individual learning condition.

The findings of the current study are in line with most of the previous studies (Johnson, Johnson & Holubec, 2004;

Jalilifar, 2010; Law, 2010) that cooperative learning has a positive effect on promoting better academic achievement. They are also in keeping with the findings (Saragi, Nation, & Meister, 1978; Pulido, 2004) that improving reading comprehension ability will lead to an increase in vocabulary knowledge and retention. Furthermore, they are in alignment with the Safadi and Rababah's (2012) findings () in that scaffolding enhances vocabulary learning as a reading comprehension skill.

However, the findings of this study are not in accordance with those of Shaaban (2006) who indicates that cooperative learning does not have any significant or positive effect on vocabulary learning in small-groups. He points out that the effect of cooperative learning depends on contextual variables like treatment duration, learners' interaction and ability levels, attitude, gender, and motivation. The findings of this study are also different from Wachyuni (2015)'s findings which states vocabulary gain was not influenced by individual or cooperative scaffolding. These differences may be due to the learners' background knowledge (Pulido, 2004) or the effects of attitudinal factors (Wachyuni, 2015).

Conclusion

The findings of this study have some important implications. They suggest that cooperative scaffolding strategy is effective in enhancing vocabulary retention in the Iranian EFL context. Therefore, engaging Iranian EFL learners in collaborative learning activities can lead to their better vocabulary achievement. However, the teachers' success in giving feedback, reinforcing, and facilitating learners' group work seems to play a key role in the outcome of this strategy. As pointed out by Shaaban (2006), cooperative scaffolding effectiveness depends on contextual variables like treatment duration, learners' interaction and ability levels, attitude, gender, and motivation. Therefore, effective scaffolding techniques may be different depending on learners' backgrounds and individual differences. Therefore, teachers should be aware of the fact that different learners need different kinds of scaffolding.

In the cooperative learning condition in this study, students were put in heterogeneous groups. Therefore, the findings are not generalizable to homogeneous groups or other contexts. Since this study included only 24 subjects, the findings must be more cautiously interpreted and generalized.

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