

A Comparative Study of Rehearsal and Loci Methods in Learning Vocabulary in EFL Context

Touran Ahour

Department of English, Tabriz Branch, Islamic Azad University, Tabriz, Iran

Sepideh Berenji

Department of Public and Basic Science, Osku Branch, Islamic Azad University, Osku, Iran

Abstract—Effective learning in foreign language settings depends on acquiring a large number of vocabularies. This study intended to compare two vocabulary learning methods known as loci and rehearsal methods to find out which one leads to better retention and recalling of words. Employing a quasi-experimental research, 80 learners from two intact classes in Islamic Azad University, Osku Branch, Iran, were randomly selected as the experimental and control groups. For the purpose of vocabulary learning, the experimental group trained in loci method while rehearsal strategy training was used in the control group. At the end of each session of the treatment, multiple-choice vocabulary tests were used to measure whether the participants can recall the lexical items from their short-term memory. A delayed multiple-choice posttest of vocabulary was also used in order to compare vocabulary learning among two groups four weeks after the treatment. Implementing Independent Samples t-test, the results indicated that experimental group was better than control group in retention and recalling of lexical items in immediate posttest. It was also found that the loci method was more effective than rehearsal in permanency of lexical items in long term memory. Syllabus designers and textbook writers can consider different learning strategies in designing vocabulary books by taking the learners' proficiency level into account.

Index Terms—loci method, long-term memory, rehearsal method, recall, retention, short term memory, vocabulary learning

I. INTRODUCTION

Managing learning appropriately by learners in EFL contexts is what appears to be necessary for effective learning. In EFL classes there is an intense exposure to information and also a need to remember a lot of data. Therefore, what is important for EFL students is to use strategies to succeed in the complex task of learning a language. According to William and Burden (1997) some of these strategies are used consciously and some of them are used unconsciously. One thing that is agreed upon to be an essential part of mastering a language is learning vocabularies. EFL students are dependent on their memory skills in order to process and remember a large input of new vocabularies in their long term memory. In Iranian setting like other foreign language settings, one of the main issues is how to teach new vocabularies. Students mostly complain about their inability to learn and use vocabularies. The new vocabularies should be taught and presented in such a way that students can learn them easily. Nattinger (1988) recommends mnemonic techniques as the best tool to learn and remember vocabularies in EFL and ESL contexts. Loci method and rehearsal are two mnemonic techniques which have been developed to help learning through repetition and context. Therefore, the aim of this study was to investigate which technique (loci or rehearsal) is the most appropriate one in EFL classes.

II. LITERATURE REVIEW

A. Foreign Language Settings and Vocabulary Learning

Recently language teachers and researchers recognized the fact that vocabulary learning is an important aspect in language classes to investigate. As Tavakoli and Gerami (2013) state, experienced teachers of English as a second language know very well how important vocabulary is and that vocabulary learning is at the heart of any language learning and language use (Laufer, 1997). Wilkins (1972) believes that without grammar, very little can be achieved, without vocabulary, nothing can be conveyed; therefore, as Zhan-Xiang (2004, p. 118) believes, "words of a language are just like bricks of a high building; despite quite small pieces, they are vital to the great structure". Thornburry (2002) also represents the fact that to improve our English we need not spending too much time to study grammar but need to learn more vocabularies and expressions. Therefore, as Thornburry indicates little can be said with grammar but almost anything with words. However, learners usually admit that the greatest source of difficulty in learning classes is with vocabulary. In fact, the problem can be clearly stated as finding the best learning skills and strategies in learning, retaining and retrieving vocabularies.

As Amiryousefi and Ketabi (2011) state, the most essential step to take in the process of language learning is choosing and deciding on required methods and strategies to memorize vocabularies in ESL and EFL contexts. The

term language learning strategy has been defined by many researchers but generally as Amiryousefi and Ketabi indicate, it can be said that language learning strategies are specific tactics and behaviors which make language learning process easy. Despite the fact that most studies on learning strategies focus on what the learners do or should do, the role of the teacher in strategy training must not be neglected. Weinstein and Mayer (1986) state that the good teacher is the one who teaches the learners the way they think, remember, learn and motivate themselves. Therefore, teachers are required to help learners choose the most effective learning strategy by considering their L1, the task and text being used, the nature of L2 itself, their motivation and purposes for learning L2, and learners' proficiency level (Schmitt, 2007).

A language teacher must also be aware of whether to employ implicit or explicit strategy training. The strategy is directly taught in explicit way of instruction while the purposes in tasks are not told to students in implicit teaching. Mizumoto, and Kansai (2009) investigated the effect of explicit instruction of vocabulary learning strategies on reading comprehension. Their results showed the outperformance of students in the experimental group. As they claim, their findings also lead to better understanding vocabulary learning strategies.

B. Mnemonics and Vocabulary Learning

According to Yates (1966), the origin of the word "mnemonic" can be traced back to ancient Greek and as Yates says it refers to Greek goddess of memory. The use of the word "mnemonic" as Yates state refers back to 500B.C. Memory affects vocabulary and grammar achievement to a great extent. Short-term memory and long-term memory are stated as two types of memory. Krashen and Terrell (2000) indicate that short term memory with a small storage capacity keeps the new information in memory only for a very short time. On the other hand, long term memory is slow in comparison to short-term memory and it has an unlimited storage capacity. The important target in language classes is to transfer the information from the short term memory to the long term memory (Schmitt, 2000). Nattinger (1988) believes that the essential element which leads to long term memory is the ability to concentrate on what is to be remembered, which is supported by motivation and interest. In other words, the main way to internalize lexical information in long-term memory is by finding some known elements in memory to attach to the new lexical items (Schmitt, 2000). Mnemonic, according to Schmitt, is a useful instructional strategy to enhance memory as it is used to teach students to link new information to the ones they already have in their memory.

Solso (1995) states that, mnemonic is either a verbal or visual technique that can improve the storage of new information already existing in long-term memory. According to Bulgren, Schumaker and Deshler (1994), Mnemonics have been proven to be extremely effective in helping people to remember things. If there will be a meaningful relationship between the material presented and what is already known, then the new information can retain in memory for a long time and can also be retrieved easily through verbal or visual clues.

Krashen and Terrell (2000) question the effects of repetitive training when learning new vocabularies. Krashen (1985) states that memorizing vocabulary and grammar rules has not worked in L2 teaching because we acquire words when we understand the message, in other words, receive "comprehensible input" (p.101). If we do not understand and recognize the meaning of vocabulary and the key elements of utterances, there will be no acquisition. Krashen and Terrell (2000) argue that 'memorized' or 'drilled' vocabulary does not stick in mind. In other words, rote learning or drills do not bring about long-term memory storage of vocabularies. Meaningful learning of lexical items results in acquisition of vocabularies with permanent memory retention. Since comprehensible input is so important for L2 acquisition, Krashen and Terrell recommend teachers to teach vocabularies in context. As an example, they suggest visual aids and pictures for classroom practice. This idea is supported by Carter and McCarthy (1988), who indicate that images and other associations enrich the context of the vocabulary to be learned, which, consequently, is more likely to be retained. However, they conclude that positive recall of the L2 learners' contextual learning is age-dependent and proficiency dependent, "thus, the more advanced the learners, the more likely they are to benefit from learning words in context" (p.15). In the early stages of language learning it is difficult to understand meaning of words in contextual sentences when the general knowledge is still poor. The notion of context is also mentioned in Nattinger's (1988) study. She believes that the longer and more complex the sentences, the better the recall; consequently, length, versatility and complexity of the context have an influence on the recall of words. A possible reason for this would be that it creates a situation where deeper processing is needed. The most efficient mnemonic technique to encourage students to learn vocabularies in context and through visualization is the loci method.

C. Loci Method

Loci method is actually the oldest mnemonic technique. This method can be helpful in remembering lists of words and retrieving vocabulary through visualization. According to Mirhassani and Eghtesadei (2007), the loci method combines the technique of active visualization with already known structures and experiences. In other words, vocabulary or digits that you want to remember are connected to a well-known path that gives them inner life with pictures. In this regard, Mirhassani and Eghtesadei also (2007) state that in using this method we image a known place such as a school and then try to link each new word with different parts of that place in order to memorize vocabularies. As people's experiences are different, students may come up with different pictures (Thomson 1987). Individuals are also different in tendency and capacity to use their visual imagery (Clark & Paivio, 1991). Jamieson and Schimpf (1980) believe, subject-generated pathways are more effective than experimenter-generated pathways because the former are more specific and, De Beni and Pra Baldi (1989) also refer more to the autobiographical elements which aid memory.

The purpose of the loci method is to learn a well-known path with loci (locations) until it can be more or less automatically remembered. This path can be a room or a familiar sequence such as the morning routine. According to Nattinger (1988) “to memorize an item, one forms a visual image of it and places it at one of the loci in one’s imagined scene. Retrieval of these items then comes about effortlessly when the entire scene is brought back to mind” (p.65).

According to Moe and De Beni (2005),

“Application of the Loci method involves: (1) selecting and memorizing a series of distinct loci along a familiar pathway; (2) creating an image for each item to be remembered, or if applied to passages, for each cue-word correspondent to a concept; and (3) placing images of the items in the selected loci. In the recall phase, the images to be transformed into corresponding verbal items are found when mentally retracing the Loci pathway. When using the Loci method, subjects must imagine twice. First, they have to adequately visualize the Loci pathway. Then they have to imagine the items or cue-words and place them in the selected loci. The images are different according to the material to be studied, while the Loci pathway is always the same.” (p. 95)

Rehearsal

Rehearsal is the most frequently used technique for encoding information into long term memory, which is memorizing material with the help of repetition. It has also proven to be the most effective technique for memorization and retrieval. Banikowski (1999) explained rehearsal as retaining the information in working memory by repeating it again and again. He also said information would be transferred to long term memory through rehearsal. According to Banikowski (1999), there are two types of rehearsal; maintenance rehearsal and elaborative rehearsal. Maintenance rehearsal is just repeating information through rote rehearsing. In contrast to maintenance rehearsal, elaborative rehearsal provided a connection between new information and some existing information. This kind of rehearsal resulted in storing information into long term memory.

According to Hayati, Samian and Tavakoli (2012), the repeatedly used strategy among EFL Iranian learners is rote-learning. In addition, there is an association between the learners’ proficiency level and the use of rote learning strategy. It means students with low proficiency level consider rote learning as the best and the most important strategy while the high-proficiency level students consider rote learning as one of the various ways of vocabulary learning.

III. EMPIRICAL STUDIES

Investigating the effects, recognition and instruction of different learning strategies in general and vocabulary in particular in the process of second and foreign language learning is not something new. There are, however, few studies on mnemonic devices most of which indicated that in comparison to other learning strategies mnemonic techniques lead to higher levels of second language vocabulary retention both in immediate and delayed recall. For example, Atkinson and Raugh (1975) investigated the efficiency of the keyword method in learning Spanish vocabularies. The keyword method proved to be highly effective as the experimental group outperformed the control group with 88% correct answers in final test. Wyra, Lawson and Hungi (2007) examined the effects of key word method on recall of word-meaning pairs. Their study also indicated that students using key words method were more successful in recalling lexical items.

In another study Baleghizadeh and Ashoori (2010) compared the word list and the keyword methods to investigate which one leads to immediate retention of English lexical items in a normal English class condition. The study took place in one of the schools in Astara, Iran with 44 low proficiency level female participants from two intact classes. The two classes were randomly chosen as the word list group and the keyword group. On the recall test, the participants in the keyword group were more successful than the word list group. Saeedi and Mohajernia (2012) compared the effectiveness of keyword and context methods in immediate and delayed retention of lexical items and also the rate of forgetting in EFL classes. 40 learners from two intact classes in one of the English institutes in Khorramabbad, Iran participated. They were randomly assigned to the keyword and context groups. Implementing a quasi-experimental method, it became evident that the keyword group learners outperformed the context group learners in recalling vocabularies immediately after training and one week later. The context group also indicated high rate of forgetting in comparison to the key word group.

However, due to the little research done in this area, this research intends to compare rehearsal and loci methods in learning vocabulary in the EFL context of Iran. For this purpose the following research questions and hypotheses were developed to process the issue:

Research Questions:

1. Do loci and rehearsal methods of vocabulary instruction affect learners’ vocabulary development differently during treatment sessions?
2. Does the permanency of acquired lexical items in long term memory differ implementing the two techniques of vocabulary teaching?

Null Hypotheses:

H01. There is no significant difference between loci and rehearsal methods regarding their effects on vocabulary developments during the treatment sessions.

H02. There is no significant difference between loci and rehearsal methods in terms of the permanency of acquired lexical items between loci and rehearsal methods.

IV. METHOD

A. Design

This study was a quasi-experimental research with pretest-posttest nonequivalent groups design and adapted a quantitative approach with data in the form of written tests. English vocabulary learning was considered as dependent variable and loci and rehearsal methods as independent variables in this study.

B. Participants

Two intact classes of intermediate and pre-intermediate undergraduate EFL junior students in Islamic Azad University, Osku Branch-Iran participated in this study. All of the participants were students majoring in Electronic engineering. The number of students participated in this study was 40 in each class. Their age range was between 18 to 25. These two classes were randomly assigned into the control (applying rehearsal method) and experimental (applying loci method) groups.

C. Instruments and Materials

Pretest of target words

To make sure of the students unfamiliarity with vocabularies which they were supposed to learn in their EFL classes, an 80-item vocabulary test was used before the experiment. Each item was intended to question the meaning of the target vocabulary items. The words were chosen from "Cover to Cover 2" by Richard R. Day and Kenton Harsch (2008). Twenty items with which the students were familiar were discarded from the experiment and 60 unfamiliar items were used in the treatment.

Immediate post-test

In order to test the learners' short-term memory with regard to the taught lexical items, ten- item multiple choice vocabulary tests were constructed.

Delayed post-test

To test lexical acquisition and recall, a delayed 60- item post-test based on the 60 vocabularies taught during the course was also constructed. This test was administered four weeks after the treatment to test the learners' ability to retain lexical items in their long term memories. Two experienced teachers in the field examined post-tests and pretest carefully and comprehensively to ensure content validity.

D. Piloting

After preparing the items and before starting the experiment, in order to remove any potential flaws in the items of the tests and to check if the allotted time is enough, the pretest and delayed post-tests (only delayed test was piloted as long as immediate and delayed post tests were the same) were piloted with forty students similar to the participants of the study in terms of their English background knowledge. Most of the target lexical items were taught and studied before the experiment. Some malfunctioning lexical items were either excluded or changed after calculating item difficulty, item discrimination and choice distribution and also a high reliability of 0.88 was gained by implementing KR21.

V. PROCEDURE

After assigning students into the control and experimental groups, the pretest was administered to all 80 students in both classes. The students were required to choose the correct meaning of lexical items. After administering the test of vocabulary, the 20 known words were omitted from the instructional program. The remaining 60 lexical items were divided into six class sessions in order to be taught to students in both experimental and control groups in six weeks, one session in a week for 90 minutes.

Before teaching the new lexical items, the loci method was explained to the students in the experimental group in how to use this technique to memorize and recall words. After explanation new vocabularies were presented to them in each session. The students in the control group were taught the same vocabularies in each session but they were required to use the usual and known method of rehearsal which is mere repetition of words to memorize. Each session, right after the treatment, a multiple-choice vocabulary test was administered as the immediate post test to measure the participants' short term memory regarding the words taught at that session by the teacher/researcher. The average of each student's score on these six multiple-choice vocabulary tests was recorded as her/ his score for short-term memory.

Four weeks after the treatment, the delayed posttest was used to test the participants' retention of the instructed words. The learners were asked to choose the lexical items which were considered the most appropriate to complete the sentences. In order to prevent memorization effect, the order of the items in the test was changed to be varied from the order of the target words while teaching in class. The collected data were entered into the SPSS 20 for further analysis. In order to answer the research questions and test the null hypotheses of the study, Independent-Samples t-test was used. The alpha level for significance testing was set at the .05 level of confidence.

VI. RESULTS

For the first research question regarding the effect of loci and rehearsal methods of instruction on vocabulary development during the treatment sessions, every six item multiple-choice vocabulary test in each session was scored out of 20 (each question was assigned two points). At the end of the sixth session, the average of each student's score was recorded as a short-term memory score. The immediate post-test average mean scores were calculated for both experimental and control groups. Then Independent-Samples t-test was used to compare the average mean scores. Tables 1 and 2 show the results of this analysis.

TABLE I
DESCRIPTIVE STATISTICS FOR THE EXPERIMENTAL AND CONTROL GROUPS

Group	N	Mean	Std. Deviation	Std. Error Mean
Loci	40	17.31	2.33	.36
Rehearsal	40	11.66	3.42	.54

TABLE II
INDEPENDENT-SAMPLES T-TEST

		Levene Test		t-test for Equality		
		F	Significance	t	df	Sig(2-tailed)
Post1	Equal variances	5.06	.027	8.619	78	.000
	Not Equal Variance			8.619	68.77	.000

Note. * $p < .05$

As Table 2 represents, there was a significant difference, $t(68.78) = 8.619$, $p = .000$, between the loci group ($M = 17.31$, $SD = 2.33$) and rehearsal group ($M = 11.66$, $SD = 3.43$) in their vocabulary learning during the treatment, implying the better performance of the group using the loci method. Therefore, the first null hypothesis is rejected.

For the second research question regarding the difference between the two methods of teaching lexical items to measure the permanency of learned vocabularies in long-term memory, after administering the 60-item delayed posttest to students in both experimental and control groups, each question was assigned one point. These scores used as long term memory recall scores for every student. But in order to preserve consistency in this study, the scores were calculated out of 20. Then the delayed posttest average mean scores were calculated for both experimental and control groups. Tables 3 and 4 show the results of this analysis.

TABLE III
DESCRIPTIVE STATISTICS FOR THE EXPERIMENTAL AND CONTROL GROUPS

Group	N	Mean	Std. Deviation	Std. error Mean	
Post 2	Loci	40	16.35	2.07	.32
	Rehearsal	40	8.18	2.66	.42

TABLE IV
INDEPENDENT-SAMPLES T-TEST

		Levene Test		t-test for Equality		
		F	Significance	t	df	sig (2-tailed)
Post 2	Equal Variances	6.57	.012	15.285	78	.000
	Not Equal Variances			15.285	73.63	.000

Note. * $p < .05$

As Table 4 represents, there was a significant difference, $t(73.63) = 15.285$, $p = .000$, between the loci group ($M = 16.35$, $SD = 2.07$) and rehearsal group ($M = 8.18$, $SD = 2.66$) in their vocabulary permanency in long term memory, implying the better performance of the group using the loci method. Therefore, the Second null hypothesis is rejected.

VII. DISCUSSION

The aim of this study was to compare the effect of two techniques of vocabulary learning known as rehearsal and loci methods on short term memory and long term memory retention. The results indicated that there was a significant difference between the effects of two methods in both long term and short term memory retention.

The findings indicating that learners applying loci method are more successful in recalling words than learners applying rehearsal method is consistent with previous researchers' findings regarding the effectiveness of mnemonic techniques in comparison to other methods. For example, Saeedi and Mohajernia (2012) compared the mnemonic technique of keyword with context method and found out that keyword is more efficient than context method in recalling words. In another study, Moe and De Beni (2005) introduced loci method as the most effective method in recalling words especially in oral modality. Wyra, Lawson and Hungi (2007) also introduced the mnemonic keyword method as an effective technique for vocabulary acquisition. They suggested that there should be an explicit instruction of key-word method both on retrieval and encoding lexical words in language classes. In addition, they also found that the rating for ability to make images made a small but significant contribution to recall performance.

Loci method can enhance imagination and creativity; it can help students to not only connect the mental image of a word into the meaning of that word but also connect the word to their background knowledge of familiar places (Mirhassani and Eghtesadei, 2007) indicate,. Therefore, it can be said that this method leads to meaningful learning and

in this way the degree of rote learning can be decreased (Jenpattarakul, 2012). This method also decreases students' feeling of stress that results in enjoying the learning process. This fact was actually seen in the experimental group applying loci method to memorize lexical items.

Compared to the loci method, learning through rehearsal method is more time consuming. As it is usually seen in actual EFL classes, the students always state that learning vocabularies through rehearsal makes them bored because they need to repeat large number of words to memorize. It is a fact that this kind of learning never leads to meaningful learning.

VIII. CONCLUSION

As Moe and De Beni (2005) stated, loci method improves and enhances vocabulary learning and retention. Therefore, it is better to incorporate this method to the students' regular language learning schedule. Students also prefer to work on the vocabulary learning methods which can help retention and recalling of lexical items more effectively.

Because of the importance of language learning strategies, the role of teachers are really important. Teachers not only should be familiar with different kinds of learning strategies but also should be familiar with their students' characteristics, such as their age, proficiency level, their background knowledge as well as their learning style and preferences to choose the most appropriate and effective strategy for students.

Several implications can be drawn from the findings of this study that can be a great asset for language practitioners, teachers and students in an EFL context. First, researchers, teachers and practitioners should notice the importance of L2 vocabulary teaching methods in EFL classes. The results of this study may assist EFL teachers to provide answers for students who ask for the effective methods for vocabulary learning.

The knowledge of different vocabulary teaching techniques make teachers develop positive attitudes toward incorporation of the best and varied methods in conventional teaching contexts. The findings are also useful for teacher trainers to develop practical methods of vocabulary instruction.

This study can also help syllabus designers and textbook writers to introduce different mnemonics within the graded vocabulary books and other materials by taking the proficiency level of students into account.

In the present research gender and age were not taken into account. A more detailed study is needed to explore the relationship between these variables and the implementation of loci method in foreign language learning context.

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Touran Ahour is an assistant professor and academic staff member at the Faculty of Persian Literature and Foreign Languages, Islamic Azad University, Tabriz branch, Iran. She has received her PhD degree in TESL from the University Putra Malaysia. She has published several books and articles in international scholarly journals. Her research interests include writing assessment, materials evaluation, reading-writing connection, and ELT issues.

Sepideh Berenji is PhD student and academic staff member in English Language Teaching, Department of Public and Basic Science, Islamic Azad University, Osku branch, Iran. She has published several articles in international scholarly journals and presented articles in several international and national conferences. Her research interests include ELT issues and discourse analysis.