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Research paper

Effect of Word Sorting Techniques on Iranian Low and Mid Achievers' Vocabulary Recall and Retention

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Abstract

The present study examined the effect of word sorting techniques on intermediate Iranian low and mid achievers' vocabulary recall and retention. To fulfill this purpose, 100 intermediate EFL learners aged 18 to 45, majoring in TEFL and Translation courses at Islamic Azad University of Abadan, participated in this research. Regarding their performance on a standard language proficiency test (PET), already piloted, the participants were randomly divided into one experimental (N=50) and one control group (N=50), each of which was subdivided into two levels, namely low (N=25) and mid (N=25). First, the participants took a researcher-made vocabulary pre-test to assess their homogeneity regarding the degree of word familiarity with the target words. During the treatment, the target words were taught with word sorting in the experimental group, while traditional techniques were employed with the control group. Two weeks after the end of the treatment, a parallel post-test (already piloted) was administered. A month later, the participants took a piloted follow-up posttest, as well. The descriptive and inferential statistics of the mean scores indicated that word sorting had affected the experimental groups' recall and retention. Their test performances were significantly different from their control group counterparts. They had outperformed the control group concerning word recall and retention.

Keywords: Low achievers, Mid achievers, Vocabulary recall, Vocabulary retention, Word sorting

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Introduction

As an essential component of language learning and a crucial section of any language program, vocabulary has established a remarkable status in both teaching and research over the past three decades (Ghalebi et al, 2021). Word sorting techniques as a cognitive strategy are so overemphasized in SLA that the research literature attributes such a term as a core component to the contributing word range needed for both developing language proficiency and proceeding the communicative events in a foreign or second language (Lauritzen, 2010).

Studies throughout the 1980s and 1990s reveal that vocabulary skills and knowledge are the precondition for most other language abilities. Lexical growth must therefore be provided in language instruction (Nguyen & Le, 2022). To reach this goal, those exercises that address deeper engagement with words should be considered and used by the teachers in the classroom. (Nemati, 2009). Language teaching methodology has always attempted to utilize the most appropriate techniques to enhance the breadth and depth of the learner's word knowledge. In addition, two more issues of word recalling and word retention have been recently considered by researchers (Pishghadam et al, 2010). Therefore, to learn and retain many unfamiliar words in a limited time without adequate opportunity to internalize what has been learned requires vocabulary learning to be performed through carefully planned and effective approaches (Pei & Lin, 2020).

To help students overcome word retention problems, teachers have been utilizing various vocabulary learning techniques. One technique is word sorting, which is placed under the category of cognitive strategies (Oxford, 2011). Word sorting is a technique through which students try to find similar patterns or different features to analyze words (Larson, 2010). Through word sorting, learners can learn how to develop classification and deduction that build complex reasoning skills.

There are two types of sorts. Concept sorts addressing the words categorized by features other than their spelling patterns, such as alphabet sorts using various fonts, or content terms. Spelling sorts referring to words categorized by the relationship between/among pronunciation, letter patterns, word origins, and meaning (Rezaei Gashti, 2021). Spelling sorts can be categorized by sound (using pictures and objects) and pattern (using printed words). Sorting is done in three ways: open, closed, and multiple. The first is about categorizing the words by students. The second one deals with sorting based on the teacher's categories. In the third activity, students sort the same set of cards in various ways, hence developing learners' flexibility in considering words in a variety of ways. Word sorting contributes to learners' word knowledge development (Lauritzen, 2010). This development occurs since learners, via word organizing, can pay attention to both particular lexical features (conceptual, phonological, orthographic) and meaning-related characteristics of those words. Word sorting puts instructional emphasis on the exploration of patterns that can be detected in the sound, structure, and meaning of words. Thus, word sorts contribute to orthographic or spelling knowledge useful in efficient reading as well as efficient writing (Sabarlel & Penina Oraile, 2022). The following research question is formulated as follows:

To what extent do word sorting techniques have any significant effect on learners' vocabulary at the low and mid-levels of English language proficiency?

One of the key features of word sorting is the discussion that occurs among students as they work their way through the terms, discussing the relationships of the words to each other and deciding how to categorize and organize the terms and concepts (Nixon & Fishback, 2009).

Background

Language learners with large and rich vocabulary are believed to improve their listening, reading, speaking, writing, and thinking abilities (Salehpour et al, 2022). As it is obvious in the domain of vocabulary learning, the problem is not just in learning second language words; rather in remembering them. Therefore, various procedures have been recommended to facilitate vocabulary retention. There are other advantages attributed to word sorting in research literature. For instance, it helps learners learn and better remember new words by working in small groups. The activity allows them to think about the probable relationships among the words (Weimer, 2010). This can produce a framework or context for using the words through which an easier short and long-term word recall would be possible (Weimer, 2010). Besides, word sorts help students recognize the semantic relationship among key concepts.

Research suggests that word sorting is an excellent way to increase vocabulary and reading comprehension skills for older students as well as for students with special needs. It boosts word knowledge, reading, and comprehension in children with learning differences and disabilities. Students learning English as a second language can also benefit a lot from reading and word knowledge with word sorting exercises. Using and understanding words in foreign texts requires a good deal of vocabulary. English learners require a large vocabulary to function in this language (8000–9000-word families necessary for reading and 5000–7000-word families for speaking).

Learners need to use words in speaking or writing and understand them while listening to a foreign or second language or reading a text. Two issues can be highlighted in this regard. In other words, the higher the pace of learning new words is, the more quickly the target language proficiency can be achieved. This can, in turn, benefit the learner's ability to communicate in the

target language. The second issue concerns whether the language learner can employ or understand the word after a long period.

Word Sorting Technique

Cognitive psychologists and language acquisition scholars working within the framework of cognitive psychology believe that retention and recall of information are determined by how the information is processed. According to Lauritzen (2010), word sorting is defined as "an instructional technique in which students organize words printed on cards into columns based on particular shared conceptual, phonological, orthographic, and meaning-related features. Word sorts allow students to compare and contrast words. Students begin to think about patterns they see and hear in words they are studying. These patterns can then be applied to the reading and spelling of unknown words.

Word sort is a technique that helps students learn and better remember new vocabulary. Students work in small groups, with each group given an envelope containing key terms on separate slips of paper (Shirzad et al, 2017). Students are instructed to discuss what they think the relationships among the words might be. After exposure to the words in the text or lecture, students get back into their groups and re-sort the words, comparing their new arrangements with the ones they first constructed (Weimer, 2010).

As a conclusion, the research literature indicates that previous studies, including quasi-experimental studies, have dealt with learning vocabulary and reading comprehension. However, the role of word sorting strategies has not been considered, especially in terms of short- and long-term learning. The other research gap that can be realized in the previous literature is to ignore the learners' level of proficiency regarding vocabulary learning. Therefore, there is a need to explore

the role of word sorting techniques in learning vocabulary and how to boost learners' word knowledge at various English levels of proficiency.

Teaching Vocabulary

Though some teachers may assume that vocabulary learning is easy, learning new vocabulary items has always been difficult for learners. Despite employing different ways of learning vocabulary by the learners (mobile-assisted vocabulary learning, digital apps, flash cards, notebook, using both bilingual and monolingual dictionaries), vocabulary is undoubtedly the most sizable and unmanageable component (Nemati, 2009; Xodabande et al, 2022). In many EFL classes, even where teachers have allocated much time to vocabulary teaching, the results have been disappointing, especially where English is not the main medium of communication. Therefore, it seems that teachers and EFL learners need to employ and benefit from appropriate and efficient strategies to retain the new words. Based on what is mentioned above, the present study investigated whether or not using word sorting techniques could improve EFL learners' vocabulary recall and retention (Strong, 2023).

Wei (as cited in Jenpattarakul, 2012) stated that nowadays, long-term retention has received wide attention as one of the greatest problems in learning new words. Khabiri and Pakzad (2012) stated that, as is obvious in the domain of vocabulary learning, the problem is not just in learning second language words; rather in remembering them. Craik and Lockhart (1972, cited in Nemati, 2009, p. 15) mentioned that according to the “Depth of Processing Hypothesis", the more cognitive energy a person exerts when manipulating and thinking about a word, the more likely it is that they will be able to recall and use it later.

Methodology

Design of the study

This study aimed to investigate the effect of word sorting techniques on intermediate Iranian low and mid achievers' vocabulary recall and retention. This study was quasi-experimental research with a pretest and posttest. Data were gathered via a quantitative procedure dealing with learners at mid and low proficiency levels. The Preliminary English Test (PET) was utilized to assign learners into two bands of mid and low English language achievers.

Participants

The participants of the present study were adult EFL learners who enrolled in TEFL (Teaching English as a Foreign Language) and Translation courses at Islamic Azad University of Abadan in the academic year of 2021-2022. Their ages ranged from 18 to 45 years old, with an average age of 24. At the first stage, a larger sample of 150 EFL learners was selected as the research population. A pilot language proficiency test, a sample of the Preliminary English Test (PET), including four language skills, was administered to them. Following the administration of PET, 100 EFL learners, whose scores fall within the range of PET band scores of intermediates (the range of 30 to 47) out of the sum of 72 marks (67 for listening, reading, and writing and 5 for speaking) were chosen to take part in the pretest.

The selected participants were thus randomly divided into two groups, mid (N=50) and low (N=50). Then, each group was subdivided into two levels; hence, low and mid participants. Out of the 100 students. 50 students whose scores were one SD above the mean were selected as mid, and the ones whose scores were one SD below the mean were selected as low achievers. Then, each

level was randomly assigned to the mid and low groups. Totally, mid (N=50) and low (N=50) groups and four subgroups were recruited in this study, each with 25 participants.

Twenty intermediate students, other than the participants of the study, formed the pilot group, who were studying English at the same university where the main study was conducted and had almost the same characteristics and language proficiency level as those of the target sample. The vocabulary pretest was used as the basis for selecting the subgroups in both the mid and low groups. First, the scores were arranged from the highest to the lowest, and then they were divided into two levels corresponding to the two subgroups, as low (the low 50 percent) and mid (the middle 50 percent) achievers. In other words, the learners were divided based on their scores gained in the pretest of vocabulary.

Instrumentation

Preliminary English Test (PET)

The English language proficiency test used in the study for homogenizing the participants was a sample of the PET adopted from PET Practice Tests by Jenny Quintana, Oxford University Press (2004). PET, a standardized test by Cambridge ESOL, is an exam for people who can use written and spoken English at an intermediate level. It tests four skills of reading, writing, speaking, and listening. The test consisted of three papers: paper 1 for reading/writing, paper 2 for listening, and paper 3 for speaking. The listening part with 25 items required the participants to understand the meaning of a range of recorded everyday-life spoken materials.

Vocabulary Pre-test

To measure the participants' degree of familiarity with the target words at the onset of the study, an 83-item vocabulary test was designed based on the treatment materials and piloted by the researcher. This test, taking 70 minutes, consisted of 83 multiple-choice items, each of which examined one single word. The reliability of the test was also estimated through KR-21 (r= 0.85).

Vocabulary Immediate and Follow-up Post-tests

At the end of the treatment, a piloted researcher-made post-test was administered for 70 minutes to investigate the students' retention of the target vocabulary. The post-test was a modified pre-test with the same content and was changed to prevent learners' remembering the pre-test items. The post-test already piloted, was administered two weeks after the end of the treatment. Its reliability coefficient was also calculated through KR-21 (r= 0.73).

Materials and Procedure

Top Notch 2A was used as a textbook developed by Saslow and Ascher (2017), and English Vocabulary in Use B1 level (i.e., intermediate) by Redman (2011), Cambridge University Press, were used in this study. The former consisted of 8 units, and the participants dealt with all eight units.

As for the vocabulary tests, first the researcher selected 100 words from the target materials and gave the list of these words to the pilot group to mark the known words by providing a synonym or the meaning in either L1 or L2. As a result, 10 words which were proved as known

by 60% of the students were discarded. In the next stage, a vocabulary test was designed based on the remaining 90 words and piloted with the same group.

After running item analysis and discarding the malfunctioning items as well as the items answered correctly by 60% of the participants, the researchers came up with an 83-item test used as the pre-test. This test was given to the actual participants before the treatment.

An independent-samples t-test was run to calculate the homogeneity of variances, hence ensuring the lack of any significant difference between the mean scores of both groups before the treatment. After that, the English classes were formed and held twice a week. Then, the treatment period began and continued for 16 sessions, with each session lasting for 90 minutes. The researcher taught both groups.

Sorts were done in Open sort when the participant decided how to categorize the words (affecting their thinking) or in closed sort when they sorted words based on the categories provided by the teacher (focusing on recognition and production Finally, multiple sorts were required in which learners sort the same set of cards in various ways (e.g., visual pattern).

Word strategies were accomplished through 15 to 20 minutes daily instructional-based group levels, Demonstrate-Reflect-Extend in partners, Students sort, weekly schedule working for the classroom, and integrating word study into reading and writing. The low group was taught through the traditionally typical techniques of teaching vocabulary, such as definition, using the first language, synonyms, and explanation, all of which were classified into three categories of visual (photographs, wall charts), verbal (synonyms and definitions), and translation (using L1).

Two months later, a follow-up 70-minute posttest, including 83 multiple-choice vocabulary items and parallel to the pre- and immediate posttest, was administered to determine the participants' word retention. Finally, to address the research null hypotheses, independent samples

t-tests were also run to study the effects of word sorting techniques on improving EFL learners' vocabulary recall and retention among mid and low achievers. All the above-mentioned data of both groups were analyzed with the aid of SPSS, version 26.

Results

The piloted PET was administered to homogenize the participants. 150 students participated in the test administration. From among the 150 students taking the test, 100 students whose scores fell between one standard deviation below and above the mean were selected to comprise the main participants of the study (Table 1). The reliability of the PET actual administration was calculated (α= 0.95) to reassure the test reliability.

Table 1.
Descriptive Statistics of Actual Administration of PET, Pilot Pre- and Posttest

	N	Min.	Max.	Mean	Std. Deviation
Research Population	150	9.00	78.00	44.92	17.34
Pretest	20	3.00	11.00	6.6	2.4
Post-test	20	4.00	10.00	6.76	2.31

Table 1 shows the mean of the test scores gained from the participants in the vocabulary pre-test piloting. The test reliability in the vocabulary piloting phase was obtained via the Kuder-Richardson coefficient 21 (KR-21), and an acceptable reliability of 0.93 was obtained. After deletion of the seven malfunctioning items, the reliability of the test shifted to 0.94. The table shows the mean of the test scores gained from the participants in the vocabulary post-test. The K-R21 coefficient was used to calculate the reliability of the post-test piloting phase, and an acceptable reliability of 0.88 was obtained. To ensure the homogeneity of the two groups of learners regarding their vocabulary knowledge before the start of the treatment, the piloted pre-

test was conducted, and since this is a parametric test, the normality assumption was also checked. Tables 4 and 4 show the descriptive statistics of the vocabulary pre-test in both groups and their subcategories (low and mid).

Table 2.
Descriptive Statistics of the Experimental Group

Groups	N	Mean	Std. Deviation	Skewness		Kurtosis	
				Statistics	Std. Error	Statistics	Std. Error
Pre mid	25	18.28	13.77	.439	.464	-1.511	.902
Post mid	25	31.32	10.45	-.272	.464	-.474	.902
Follo-up mid	25	24.96	12.70	.258	.464	-1.323	.902
Pre low	25	17.92	12.41	.966	.464	.246	.902
Post low	25	29.96	16.25	-.673	.464	-1.032	.902
Follo-up low	25	24.68	12.56	.075	.464	-1.660	.902
Valid N)	25						

Table 2 displays the mean scores and the standard deviations of the highest and the lowest in the experimental group. In addition, the skewness and kurtosis scores show that the data were normally distributed around the mean score. Therefore, the parametric statistics could be used in the data analysis.

Table 3.
Independent Samples Test of Two Groups

Groups		Levene		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
		F	Sig.					
Pre low vs. mid	Equal variances assumed	.428	.516	-.825	50	.413	-2.70	3.28
Post low vs. mid	Equal variances assumed	4.058	.049	2.503	50	**.001**	10.18	4.06
Follow-up low vs. mid	Equal variances assumed	6.232	.016	2.732	50	**.003**	8.90	3.25

Table 3 displays t-test data analysis for the groups. As the table shows, the significant levels in bold face for the groups at (0.05).

Discussion

The major concern of the present study was to explore the effectiveness of using word sorting techniques on the EFL learners' vocabulary retention. The results obtained from the post-test of the experimental groups were compared. It showed that the means and standard deviations of the experimental mid group and low group were different on the post-tests. In other words, the performance of participants in the experimental groups was significantly different. Moreover, the results of the Independent Samples t-test showed that statistically, there was a significant difference between the experimental mid and the low groups in terms of vocabulary retention, which is matched with Strong's (2023) findings that emphasize word sorting techniques as an effective technique to boost learners 'vocabulary retention. As it was shown in the results section, the experimental group outperformed the low group. One reason for obtaining a better result in the word sorting group might have been that sorting activities are active, thoughtful, problem-solving tasks. These results are also in line with (Salehpour et al, 2022), who believe that word sorting gives hands-on opportunities for students to work through the complexities of language. It also promotes word analysis, which can benefit students in other reading and writing activities. They can be beneficial for helping students to spell words, recognize words, make word connections, become aware of the phonemic structure of words, and gain the meaning of words.

The findings of this study are matched with Rezaei Gashti (2021), who noted that a word sort is an active-learning, critical-thinking strategy that involves students in small groups of three or four actively discussing words that have been provided for them by the instructor. Therefore,

grouping students is one of the most important elements of word sorting instruction that promotes literacy success, especially for at-risk students. These groups should always remain flexible and dynamic. Sabarlel and Penina Oraile's (2022) ideas are in line with the present study, which found that the students who participated in word sorts, working in small groups to discuss their word categories, reported higher confidence during test taking.

Conclusion

Word sorting technique provides an enjoyable way to incorporate active engagement in repeated practice for word learning. Students learning English as their second language can make great gains in word knowledge with word sorting exercises. Therefore, it can be concluded that using word sorting techniques by Iranian intermediate EFL learners had a significant positive effect on their retention of new vocabulary. Besides, the results did indicate a strong effect size and, hence, the findings may be generalizable.

Many language teachers in EFL contexts traditionally treat vocabulary teaching. In addition, in teacher-centered classes where students have a passive role in learning, teachers are considerably remiss in teaching this paramount component of language. Teachers should try to familiarize their students with innovative vocabulary teaching strategies, such as word sorting techniques. In addition, the findings of this study suggest that EFL learners need to take more responsibility for their learning and rely less on teachers, and adopt cooperative learning. The use of word sorting could help learners use contrast categories established about one another, not isolated patterns, and know "what is" and "what is not". Learners can work in group collaboration and peer interaction, and talk to learn. The connection between words and reading, or what students are writing, makes learning words in a meaningful text.

The present study focused on the effects of using digital word sorting techniques on the vocabulary retention of intermediate EFL learners (Xodabande et al, 2022). The subsequent suggestions are presented for further exploration. This study can be replicable at different levels of proficiency. More comprehensive research on different variables, such as participants' cultural background and different proficiency levels of English, is necessary. Also, learners could be studied to investigate the effect of word sorting strategies. The current study made use of quantitative data from pre-test and post-test results to evaluate vocabulary retention. One fertile direction for further research would, therefore, be to collect qualitative data from sources such as learners' self-reported application of so-called techniques to complement the findings from this study. Further studies should explore the effectiveness of using word sort techniques with a larger number of students and allocate a longer period than only 16 sessions, which is the time spent for the current study. Future studies can include word sorting strategies compared to other innovative teaching strategies, such as semantic mapping and the keyword method.

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