

Enhancing Long-term Retention by Memory Vocabulary Learning Strategies

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In this study, it was intended to compare the impact of teaching through memory strategies on experimental group in comparison to the control group. Hence, 140 and 170 pre-university female students in India served as control and experimental groups respectively. The results indicated that the students of the experimental group outperformed both in short-term and long-term scores, and portrayed the superiority of memory strategies in short-term and long-term retention. As many learners do not develop sufficient mastery of the vocabulary, explicit instruction of memory strategies and giving strategy awareness can facilitate them to store and retrieve new vocabulary items. A significant difference was found between what the participants claimed in self-report and what they actually performed on post-test 1. As a result it was shown that in spite of being widely used, over-dependent on survey tools as a means of data collection is open to question.

Key words: Memory Strategies, Vocabulary Learning Strategies, Short-term Retention, Long-term Retention, Imagery

INTRODUCTION

Although some teachers may think that vocabulary learning is easy, learning new vocabulary items has always been challenging for the learners. Different ways of learning vocabulary are usually utilized by the students

such as using flash cards, notebooks, referring to bilingual and monolingual dictionaries to decipher the meaning, or giving some synonyms and antonyms to name but a few. In spite of these efforts, and invariably experiencing so many difficulties, vocabulary is by far the most sizable and unmanageable component. A fundamental query is raised as to why learning vocabulary is such challenging and unproductive experience and which method could be used to make vocabulary less of struggle.

One possible answer to the problem of vocabulary is applying teaching vocabulary learning strategies. Research into language learning strategies began in the 1960s and since the mid 1980s, vocabulary learning has been drawing growing attention from ESL researchers, particularly, the 1990s, witnessed a noticeable number of publications, vocabulary is now a current focus in ESL pedagogy and research (Wei, 2007). It is witnessed by the great number of research done on vocabulary (Nation, 2001; Oxford, 1990; Paribakht & Wesche, 1993 to, name but a few).

Generally speaking, vocabulary can be taught in different ways each of which with its own merits and demerits. Learning vocabulary from context or 'incidental learning' as opposed to 'direct intentional learning' are two different ways of learning vocabulary. According to Nation (2001), extensive reading is useful for vocabulary growth and is called incidental learning.

On the other hand, vocabulary can be learnt 'intentionally' through some strategies and plans. There exist conflicting views among language professionals concerning the relative superiority of two approaches of 'contextualized' and 'de-contextualized' ways of learning. Oxford and Scarcella (1994), for example, observed that while 'de-contextualized learning' (word list) may help students memorize vocabulary for tests; students are likely to rapidly forget words memorized from lists.

According to Nielson (2006) at early stages of language development, 'de-contextualized' vocabulary instruction has been found to be more effective in building a fundamental vocabulary than the contextualized reading. Later he suggested that teachers of beginner level learners need to include greater amount of 'de-contextualized' vocabulary instruction (word list) gradually

increasing toward more context based vocabulary learning (extensive reading) as the language ability of the learners develops. Of 'de-contextualized' vocabulary memorization strategies, 'memory strategies' involving deep semantic processing of target word have shown to be more effective than memorization techniques involving shallow processing such as oral rote repetition (O'Malley & Chamot, 1990; Oxford, 1990).

According to '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 (Craik & Lockhart, 1972; Craik & Tulving, 1975). This hypothesis implies that it is not important how recently learners have learnt something. What is of more importance in learning is, in fact, the depth of processing; in other words, students must be taught on how to process information deeply. Such implications extend to pedagogy as well, suggesting that exercise and learning strategies which involve a deeper engagement with words should lead to higher retention compared to shallow activities. Given the above hypothesis, the present article seeks to introduce, from among different ways of learning and teaching vocabulary, memory vocabulary learning strategies which contribute to deep processing and lead to better retention.

Furthermore, taking into account the most suitable exercises without considering other factors that can affect learning is not of much use to the students. Teachers' awareness of other factors such as neurolinguistics, different functions of the brain, learning and forgetting, which is a part of learning plays crucial roles in teaching.

The history of learning strategies goes back to Rubin (1975) who pioneered much of the work in the field of strategies. From then, different classification and taxonomies came into vogue (Cohen, 1990; O'Malley & Chamot, 1990). From among those researchers tackled language learning strategies Oxford's (1990) classification is the most comprehensive detailed system embodying direct and indirect strategies. She defined language learning strategies as, 'steps taken by students to enhance their own learning, they are tools for active, self-directed involvement, which is essential for

developing communicative competence.’ (1990, p. 1)

Oxford (1990) classifications embodied direct and indirect strategies with 6 categories, 19 strategies and 62 sub-strategies. Direct strategies directly involve the target language and require mental processing of the language. Direct strategies consist of ‘memory’, ‘cognitive’ and ‘compensation’ strategies. Similarly, ‘indirect strategies’ as the word conveys are strategies which are indirectly involved in learning. In other words, these strategies support and manage language learning without directly involving the target language hence, they underpin the business of language learning and include ‘metacognitive’, ‘affective’ and ‘social’ strategies.

With the emergence of the concept of language learning strategies scholars have attempted to link these strategies to other aspects of language such as vocabulary as well. Studies such as O’Malley and Chamot (1990) confirmed that most language learning strategies are used for vocabulary tasks too. In the same vein, all memory strategies based on Oxford taxonomy can be used for vocabulary learning tasks the effect of which has been a motive to conduct the present research on vocabulary retention.

Memory strategies that are the main concern of this article fall into four sets of ‘creating mental linkage’, ‘applying image and sound’, ‘reviewing well’, and ‘employing actions’. Other researchers dealt with systematic reviewing and different types of mnemonic strategies (Nemati, 2008; Pimsleur, 1967).

In this study from among the four sets of memory strategies classified by Oxford (1990), the three sub-strategies of ‘grouping’, ‘making acronyms’ and ‘using imagery’ were selected. These three strategies were selected because they were feasible to administer. Therefore, other strategies such as ‘representing sound in memory’ or ‘using physical response’ were excluded due to the difficulty of their administration. These strategies enable learners to store material and then retrieve it when needed for communication.

Grouping refers to classifying language material into meaningful context to make the material easy to remember by reducing the number of discrete elements. Based on Oxford (1990) using *acronyms* is a kind of placing new

words into a context in order to remember them better. We normally use acronyms in every day life such as RAM in computer science and FBI. Relating new language information to concepts in memory by means of meaningful visual imagery, either in the mind or in the actual drawing is called using *imagery*. In this article, memory strategies were selected to find the effect of using them both in storing (as evaluated by immediate post-test) and retaining vocabulary items for longer period of time (as reflected in delayed post-test) which is the aim of learning.

SIGNIFICANCE OF THE STUDY

The importance of vocabulary knowledge in language learning is clear. Without a rich vocabulary no meaningful communication can take place and communication competence relies heavily on vocabulary (McCarthy, 1990). In addition, vocabulary knowledge is one of the best predictors of reading comprehension (Nation, 2001), in other words full comprehension of text cannot take place without understanding its vocabulary. Therefore, one thing that all the researchers can agree upon is that learning vocabulary is an essential part of mastering a second language (Schmitt, 2008).

While the importance of vocabulary is clear and learning new vocabulary items happens with much difficulty, students forget what they learnt very soon or they cannot use those vocabulary items in real situations at all. Therefore, the results of this study can shed some light on the point that it is a fallacy to think understanding is remembering.

Teaching should target at increasing retention without increasing study time. Because, students forget much of what they learn, applying memory strategies is a good way to benefit from learning that provides long lasting knowledge. This study is significant from the point of view that normally researchers equated effects of instruction with duration of instruction rather than with quality or intensity of instruction. In this article it was shown that the quality of instruction is a key point in learning.

Research Questions

To accomplish this investigation, the following research questions were formulated:

1. Is there any difference between learners' performance in each sub-strategy and their strategy use as self-reported by the control/experimental group?
2. Does teaching each sub-strategy of memory VLSs (grouping, making acronyms, imagery) to the experimental group impact learners' short-term and long-term vocabulary scores in comparison to control group?
3. Does teaching memory VLSs to the experimental group impact learners' short-term and long-term vocabulary scores in comparison to control group?

Participants

The subjects of this study comprise 310 female Pre-University (PUC) students from an all female governmental school in Mysore, India. Kannada, the mother tongue of the State of Karnataka, was the medium of instruction in that selected school. The participants have been exposed to English for 7 year (from the 5th standard) and their age range was from 16 to 18. The students were selected through multi-stage random sampling, the intact group. Thus the 4 classes were randomly assigned to control and experimental groups. Finally, 140 students served as control group and 170 students as the experimental group.

Instruments of the Study

To collect the data required, the following questionnaires were employed:

Self-report questionnaire: This self-report questionnaire included 6 questions and sought answers regarding the use of some memory vocabulary

learning strategies. It was based on a five-scale Likert measurement including *never, seldom, sometimes, usually* and *always* as its options. The questions of this self-report were drawn from Strategy Inventory Language Learning (SILL) version for speakers of other languages learning English (version 7.0 in Oxford, 1990). Then, the researcher made some modifications to the questions to be adjusted to the participants. (Appendix 1)

Vocabulary knowledge scale (VKS): One of the most commonly accepted views of vocabulary acquisition maintains that it occurs along a continuum of development (Waring, 2002). The simplest continuum view of vocabulary is from less knowledge of words to more knowledge of words. Within the last five to 6 years, the vocabulary knowledge scale of Paribakht and Wesche (1993) has gained significant popularity in second language vocabulary assessment and is being used in a variety of studies (Waring, 2002). The particular aim of this VKS is to construct a practical instrument for use in studies of initial recognition and use of new words. It came into vogue as a reaction to the shortcomings of multiple choice tests. Having employed a 5-point scale, this instrument combines self-report and performance items to elicit self-perceived and demonstrated knowledge of specific words in written form. The rating scale ranges from total unfamiliarity through recognition of word and some idea of its meaning to the ability to use word with grammatical and semantic accuracy in a sentence. This instrument was employed for pre-test and the two post-tests. (Appendix 2)

Treatment material: The treatment handout prepared by the researcher included 9 unknown vocabulary items selected from the pilot study (3 vocabularies for each strategy) to be taught by memory strategies in the experimental groups. The treatment material started with a general definition of vocabulary learning strategy and continued with an elaboration and exemplification of each strategy all in the form of a handout to be used by participants in the experimental groups. To guarantee the participants' understanding of the strategy for each strategy a practice section was introduced. (Appendix 3)

Procedure

Pilot Study

A pilot study was carried out with one class (30 students) before the main phase of the study for the selection of vocabulary to be employed and taught during the main research.

First, a self-report questionnaire, in the form of Likert scale, including 6 questions dealing with memory strategies of *grouping*, *placing new words in to context* or *acronyms* and *using imagery* was given to the participants to see whether the questions of the self-report were understood by the students correctly and to get an idea about the time required by the subjects to answer each question. The calculated reliability by Cronbach alpha was 0.72. Cronbach alpha uses 'when measures have items that are not scored simply as right or wrong such as Likert scale where the individual may receive a score from 1 to 5 depending on which option was chosen' (Aray, Jacobs & Razavieh, 1972, p. 285).

Second, vocabulary level test of Nation (2001) was given to the students to measure the vocabulary size of students and to prepare the final vocabulary items required for the treatment. After analyzing the results the following words with which the students were least familiar were selected:

'Mortgage', 'mansion', and 'dwell' for the first strategy (*grouping*), 'dignity', 'stable' and 'adequate' for the second strategy (*making acronyms*) and 'herd', 'loop', and 'summit' for strategy three (*making images*). All the above mentioned strategies based on Oxford's (1990) taxonomy make memory strategies.

From the above selected vocabulary the researcher made strategy-enriched material to be used in the main phase for the experimental group.

Main Study

The main study was carried out in three steps. Both control and experimental

groups experienced the following three steps: 1) pre-test, 2) treatment along with post-test 1 (immediate post-test), and 3) post-test 2 (delayed post-test). The allotted time for teaching in both control and experimental groups was the same. Below each step will be explained briefly.

Pre-test: A pre-test was administered 14 days before commencing the main study to both control and experimental groups. The self-report questionnaire and vocabulary knowledge scale (VKS) encompassing 9 questions were distributed during the regular class time to both groups. The same VKS was also utilized in the two post-tests later.

Treatment for the control group: Teaching in the control group involved different modes of vocabulary presentation such as follows:

a) presentation of the words in isolation; b) giving pronunciation of the words orally; c) writing those words on the board; d) giving a short explanation about their parts of speech; e) elaboration of the meaning of each word through introducing synonyms (and antonyms if needed), and f) using minimal contexts, that is, some meaningful sentence.

Treatment for the experimental group: to teach to the experimental group along with applying the method used for the control group, the researcher made use of the strategy-enriched material as well. That is first, the students were familiarized with the concept of strategy and its definition, a kind of 'strategy awareness'. Then, they were asked to read the description provided for each strategy, which included some explanations and examples.

For the first strategy (grouping), the students were asked to group the following 3 vocabulary items with the same theme 'mortgage, mansion and dwell'. For the second strategy (making acronyms) which according to Oxford is a kind of new context the words 'dignity, stable and adequate' were selected. The students learnt that they could make an acronym like SAD to learn and remember those vocabularies better. Pictures of 'herd, loop, and summit' were shown to the participants for strategy three (imagery). After finishing the explanation, they were asked to do the related exercises for each group of words.

For contextualization and providing sentences for all the words the first

dictionary meaning was taken care of and taught. The sentences were obtained from different dictionaries such as COLLINS COBUILD dictionary (1990), Oxford Advanced Learners' Dictionary, 7th edition (2007), and online dictionaries such as *answer.com*.

Post-test 1: To measure the short-term improvement of the students in the control and experimental groups, immediately after finishing the teaching phase both in control and experimental groups, the first post-test was administered. The test was the same as the vocabulary knowledge scale used in the pre-test.

Post-test 2: Two weeks after the first post-test1, the same test called 'delayed' test or post-test 2 was administered again. Delayed recall after 2 weeks under experimental conditions is normally referred to as 'long-term retention.' (Yongqi Gu, 2003, p. 12). The reliability estimate for VKS was established through test retest administration. The result of the Pearson Correlation was 0.76 indicating that the instrument could elicit acceptably reliable feedback.

DATA ANALYSIS

To answer the first research question concerning the difference between learner's performance and their view in self-report some paired t-tests were run between what students said in their self-repot and post-test 1.

The results of t-tests in Table 1 represented that there was a significant difference between what the participants said in self-report and what they actually did for grouping and making acronyms. This signifies that the participants of the control group overestimated themselves for all the three sub-strategies based on their mean scores although for imagery this difference was marginal and not significant. In fact, learners reported to use these strategies more in the questionnaire than they did in the test.

TABLE 1
Paired T-Test Between Self-Report of Each Strategy and Post-Test1 of Each Sub-Strategy in Control and Experimental Groups

Group	Sub-strategies	Mean	St.d	<i>t</i>	<i>df</i>	<i>Sig.</i>	
Control	1	S*	47.857	21.360	3.792	139	.000
		P**	39.047	17.488			
	2	S	56.875	23.911	5.511	139	.000
		P	44.166	11.295			
	3	S	44.553	23.141	1.748	139	.083
		P	40.592	12.518			
Experimental	1	S	53.897	20.900	3.604	169	.000
		P	61.323	18.413			
	2	S	65.882	22.001	8.440	169	.000
		P	48.774	14.466			
	3	S	46.691	24.797	2.621	169	.000
		P	52.205	13.584			

*S means self-report and **P means post-test 1.

While for the experimental group because of the impact of teaching through strategies the mean values of post-test 1 for grouping and using imagery were higher than what they said. For making acronyms students overestimated themselves in a case that even after teaching, their self-report score was still higher than that of post-test 1.

To answer research questions 2 and 3 and before analyzing the data to be sure that control and experimental groups were homogeneous enough to start the study an independent t-test was run. Table 2 shows the result of independent sample t-test between control and experimental groups.

As shown in Table 2, there was not a significant difference between pre-test of the two control and experimental groups at the 0.05. In other words, the students of the two groups were not aware of the meaning of the words to be taught in the pre-test and this proved the homogeneity of the groups.

TABLE 2
Independent Sample T-Test to Identify the Difference Between Pre-Test Scores of Two Groups

Strategy	Groups	N	Mean	SD	S. E. of Mean	<i>t</i>	<i>df</i>	<i>Sig.</i>
Grouping	Cont.	140	4.3	1.1	.09	.8	308	.39(NS)
	Exp.	170	4.4	1.0	.08			
Acronyms	Cont.	140	4.2	1.1	.09	.9	308	.35(NS)
	Exp.	170	4.1	.8	.06			
Imagery	Cont.	140	4.4	1.2	.09	1.5	308	.12(NS)
	Exp.	170	4.2	.8	.06			
Memory	Cont.	140	13.0	2.8	.23	.6	308	.49(NS)
	Exp.	170	12.8	1.6	.12			

To find out the impact of teaching through memory vocabulary learning strategies with its sub-parts the researcher made use of repeated measure ANOVA, the result of which will be shown in the ensuing parts.

The following table reveals the mean score of the control and experimental groups in the three sub-strategies and memory strategies totally.

TABLE 3
Descriptive Statistics for Sub-Strategies and Memory Strategies

Strategy	Groups	N	Pre		Post 1		Post 2	
			Mean	SD	Mean	SD	Mean	SD
Grouping	Cont.	140	4.32	1.14	7.68	2.09	7.00	2.01
	Exp.	170	4.42	1.05	10.35	2.20	9.55	2.29
Acronyms	Cont.	140	4.29	1.14	8.30	1.36	7.12	1.79
	Exp.	170	4.17	.85	8.85	1.73	9.05	1.28
Imagery	Cont.	140	4.42	1.16	7.87	1.50	7.11	1.94
	Exp.	170	4.24	.83	9.26	1.63	9.01	1.36
Memory	Cont.	140	13.05	2.78	23.83	3.99	21.25	5.15
	Exp.	170	12.87	1.59	28.47	4.66	27.63	4.09

As tabulated, a significant increase was observed from pre to post-test 1 in both groups and a decrease from post-test1 to post-test 2 again for both groups, while the increase was higher for the experimental group and the decrease was less for that group in the delayed post-test. For example, for

memory strategies, the mean increased to 23.83, 28.47 for control and experimental groups respectively and decreased to 21.25 and 27.63 in post-tests 2. Tables 4 to 7, reveal the results of repeated measure ANOVAs for each sub-strategy and memory strategies.

TABLE 4
Repeated Measure ANOVA for Control and Experimental Groups in Strategy 1 (Grouping)

Subjects Effects	Source	Type III SS	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
Within-Subjects Effects	Strategy 1	3829.3	2	1914.6	616.1	.000
	Stral*Groups	321.5	2	160.7	51.7	.000
	Error	1914.2	616	3.1		
Between-Subjects Effects	Groups	727.7	1	727.7	165.7	.000
	Error	1352.1	308	4.3		

The Pillai's trace value for strategy one was .80 with $P < .000$ so, the researcher could proceed to the next part. The Pilla's trace value allows the researcher to get repeated measure ANOVA, in the next step. The results revealed that when the participants were considered together, regardless of their group identity, the change due to the teaching phase was highly significant ($F = 616.1, p < .000$). Similarly, the interaction between strategy 1 and groups (strategy 1* group) was highly significant ($F = 51.7, p < .000$). In other words, where group-wise changes were verified again differential changes were observed. The result of between-subjects effect also revealed a significant difference between control and experimental groups ($F = 165.7, p < .000$).

For the second sub-strategy or learning the meaning of unknown vocabulary items by making acronyms which is a kind of contextualization the value of Pillai's trace was .87 ($p < .000$). The result of repeated measure ANOVA for strategy two is presented in the following table.

TABLE 5
Repeated Measure ANOVA for Control and Experimental Groups in Strategy 2
(Making Acronyms)

Subjects Effects	Source	Type III SS	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
Within-Subjects Effects	Strategy 2	3463.9	2	1731.9	986.9	.000
	Stra2*Groups	166.7	2	83.3	64.6	.000
	Error	1097.5	616	1.7		
Between-Subjects Effects	Groups	142.1	1	142.1	64.2	.000
	Error	679.7	308	2.2		

The output of the repeated measure ANOVA revealed that when control and experimental participants were examined as a single group (totally), their change in performance due to the teaching phase was highly significant ($F=986.9, p<.000$). Likewise, the interaction between strategy 2 and groups was highly significant ($F=64.6, p<.000$). The output of between-subjects effect also uncovered a significant difference between control and experimental groups ($F=64.2, p<.000$).

TABLE 6
Repeated Measure ANOVA for Control and Experimental Groups in Strategy 3
(Imagery)

Subjects Effects	Source	Type III SS	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
Within-Subjects Effects	Strategy 3	3291.0	2	1645.5	887.2	.000
	Stra3*Groups	181.1	2	90.5	48.8	.000
	Error	1142.4	616	1.8		
Between-Subjects Effects	Groups	248.5	1	248.5	99.8	.000
	Error	766.7	308	2.4		

Regarding using imagery for teaching and learning (sub-strategy 3), comparing the mean of pre and post-test of the two groups showed that again both groups have improvements after treatment. However, the improvement of the experimental group in comparison to the control group was more. The Pillai's trace value for strategy 3 was .85 ($p<.000$), thus the researcher could

proceed to repeated measure ANOVA for strategy 3.

The results of the repeated measure ANOVA unveiled that when control and experimental participants were viewed jointly as a single group, their change in performance due to the teaching phase was highly significant ($F=887.2, p <.000$). The mean increase was from 4.32 to 8.63 and then it decreased to 8.15 in delayed post-test (Table, 3). Similarly, if we consider all the participants with the effect of group the interaction between strategy 3 and groups was highly significant ($F=48.8, p<.000$). The result of between-subjects effect also uncovered a meaningful difference between control and experimental groups ($F=99.8, p<.000$) in favor of the experimental group.

As for the third research question i.e. the effect of memory strategies in short-term and long-term retention the result of ANOVA and the figure will clarify the point. The value of Pillai's for memory was .88 ($p <.000$).

TABLE 7
Repeated Measure ANOVA for Control and Experimental Groups for Memory Strategies

Subjects Effects	Source	Type III SS	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
Within-Subjects Effects	memory	31570.4	2	15785.2	1203.8	.000
	memory*Groups	1782.4	2	891.2	67.9	.000
	Error	8050.6	616	13.1		
Between-Subjects Effects	Groups	2969.6	1	2969.5	156.2	.000
	Error	5836	308	19.0		

Based on the results of the repeated measure ANOVA, it could be maintained that the change in performance resulting from the teaching phase was highly significant ($F= 1203.8, p <.000$) in the sample (sum of control and experimental groups). In the same vein, the interaction effect between memory strategies and groups was confirmed to have been set at a highly significant level ($F= 67.9, p<.000$). This implied when changes based on groups of control and experimental were considered the difference was highly meaningful in favor of experimental group. The result of between-

subjects effect also supported a meaningful difference between the two groups ($F= 156.2, p <.000$).

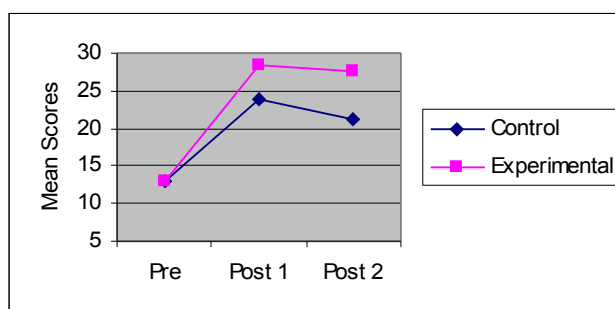


FIGURE 1
Mean Score of Pre, Immediate and Delayed Post-Tests for Control and Experimental Groups for Memory Strategies

It is clear from the above figure both groups improved from pre-test to post-test 1 while the improvement for experimental group was higher. Furthermore, from post-test 1 to post-test 2 for both experimental and control groups there was a decrease. In Figure 1, it is illustrated that this decrease was higher for the control group implying a higher forgetting level as well.

DISCUSSIONS AND CONCLUSIONS

The first research question of this study tackles self-report questionnaires. Regarding the reliability of questionnaires in language learning as a means of data collection method there is no agreement. On the one hand, some researcher believe that from among different data collection method such as interview, think-aloud protocols or observations, questionnaires can be cost-effective and allow the researchers and participants to gain a rapid understanding of the participants' strategy use (Bedell & Oxford, 1996; McDonough, 1999; Oxford & Burry-Stock, 1995). Furthermore, questionnaires

examine large samples of students, fairly easy as well as large number of variables.

On the other hand, in spite of being widely used, questionnaires are not without criticism and hence over-dependency on such survey tools is open to question. Students may not respond truthfully, either because they cannot remember or because they wish to present themselves in a socially acceptable manner as in this study. From among the criticisms of self-report questionnaires, which may be more serious than other problems, is the vagueness of the wording (Gu, Wen, & Wu, 1995) that may have caused the learners to provide different answers to the questionnaires. In other words, learners may have a problem in deciding often, sometimes, or usual. As a result a more qualitative and context-sensitive approach can be favored. The result of this study is in line with the second approach regarding strategies (Gao, 2004; Gu et al., 1995) in which students did not respond truthfully.

In the second and third research questions of this article the effect of teaching vocabulary items through memory strategies and its sub-parts (as reflected in the result of immediate test and delayed test) was examined. The results of this study reiterate the long-term effectiveness of teaching through memory strategies as well as the usefulness of giving awareness to the students. Since, in spite of the importance of memory strategies students rarely use these strategies especially that only 4% of the brain is actively utilized during traditional language teaching (Danesi, 2003).

According to Oxford (1990) memory strategies, sometimes called mnemonics, have been used for thousands of years. She brought the example of orators in ancient times that could remember a long speech by linking different parts of speech to different rooms of a house or temple, and then taking a walk from room to room but after literacy became commonplace, people forget their previous reliance on memory strategies. These days, memory strategies have occupied the lion's share of attention probably because vocabulary learning has largely been constructed as a memory problem (Yongqi Gu, 2003). The only principle that these strategies reflect is that for learning and retrieving better some 'hook or memory aids' are needed.

In this study, grouping and acronyms act as hooks that help learners retrieve better in the long run.

The importance of teaching vocabulary through memory strategies is justifiable in different ways. First, the effectiveness of memory strategies is plausible based on depth of processing hypothesis which discussed earlier. As stated earlier, according to this theory how well information is remembered is not a function of how long a person is exposed to that information, but instead depends on the nature of the cognitive processes that are employed to process that information.

This theory can be described by comparing the levels of processing to the levels in a pyramid. The bottom levels represent preliminary, shallow processing, and are concerned with physical and sensory features. The top levels of the pyramid represent deep processing and are concerned with the extraction of meaning where depth refers to greater degree of semantic involvement.

One example of this deep level processing is memory or mnemonic strategies. Thus, the outperformance of experimental group by using memory strategies can be defended by this theory. In the short-term, information can be maintained at any level, but in the long-term information is most likely to be remembered if it is processed at the deep, meaningful way (Craik & Tulving, 1972). This is an important concept because it illustrates the fact that simple rehearsal will not facilitate long-term recall, elaboration at deeper levels, however, will promote long-term recall. Thus, deeper, richer semantic processing, such as memory strategies will be more likely to enhance learning than shallower processes such as rote repetition (Schmitt & Schmitt, 1995). It can also be justified by neurolinguistics. It is a branch of neuroscience deals with various aspects of the relationship between the brain and language and bolsters the importance of teaching vocabulary strategies.

Although, knowing about the brain may have no direct implication to teaching it can have influence teaching methods. Knowledge about the brain provides a solid theoretical basis upon which the formalist paradigm can be rebuilt to meet contemporary conditions and expectations. It is useful to have

knowledge for practical reasons (Danesi, 2003).

Knowing about the brain and the two hemispheres of the brain can give teachers insight to find teaching methods which are congruent with the brain mental labor of human in a patterned fashion. The right hemisphere is the seat of imagination and spatial thinking while; the left hemisphere is responsible for analytical, reflective and verbal thinking.

Thus, by employing pictures or creating visual images of words learners can use their right hemisphere more. Of course, these mental pictures can be used for abstract words as well by associating the word with the same concrete objects and symbols. Using the brain was what the reformist wanted from the demise of Audio-lingual method until now. The reformists struck to design methods that would activate the brain in a learning productive fashion such as, suggestopedia, or total physical response. Also, based on the hemisphericity of the brain it is strongly suggests that right hemisphere is an effective distributor of new information (Danesi, 2003). Thus teaching through the right hemisphere is more effective.

The importance of applying images for learning new items through long-term memory is clear. There are three main activities attributes to long-term memory viz, storage, retrieval and forgetting. First, chunks of information transfer to long-term memory by applying visual images. Second, visual images may be the most potent device to aid recall. And the last one, applying memory strategies can promote long-lasting retention which is the aim of education. In addition, as Oxford (1990) put it, the mind storage capacity for visual information exceeds its information for verbal materials. Furthermore, a large proportion of learners have preference for visual images.

IMPLICATIONS OF THE STUDY

The findings of the present research could be employed as a trigger for language teachers to integrate strategy training into classroom instruction to facilitate learning and retention of new vocabulary items. The more teachers

know about these strategies as well as strategy teaching the more effectively they can orient their vocabulary instruction. Students could benefit a lot from the results of the present study. Using these strategies could function as a kind of impetus for all students since strategy instruction can contribute to development of learner mastery and autonomy, and accordingly can enhance language learning. Book writers, material producers and curriculum designers also can include memory strategies in their materials and books.

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APPENDIX 1

Sheet Number:

Dear student the following questionnaire includes two parts. There are 8 questions in the first part. First answer them carefully. Then move to the second part that includes 14 questions. Tick only one of the choices that best applies to you and do not leave any question unanswered.

1- Name/Family Name: **Age:**

Column	Questions	never	seldom	sometimes	usually	always
1	I group words together to study them. For instance, I group names of all vehicles or all words about a topic.					
2	I group words together spatially on a page, notebook or card by forming columns, triangles, squares, circles.					
3	I learn some new words by joining the initial letters of them and making a new word, e.g. CAP= <i>carrot, apple, papaya</i>					

4	I use new English words in a sentence so I can remember them.
5	I image the word form, i.e. I draw the picture of a pair of gloves to learn the word better.
6	I remember new English words by making a mental picture.

APPENDIX 2

VKS and scoring categories
VKS elicitation scale self-report categories

I.	I don't remember having seen this word before.
II.	I have seen this word before, but I don't know what it means.
III.	I have seen this word before and I <u>think</u> it means----- (synonym or translation)
IV.	I <u>know</u> this word. It means ----- (synonym or translation)
V.	I can use this word in a sentence: ----- (if you do this section please also do section IV).

APPENDIX 3

Sheet Number:

Some vocabulary learning strategies to learn and remember words better

As a language learner, you may come across new words each day. But do you learn them efficiently and do you remember them after a period of time? The aim of this handout is to introduce a number of vocabulary learning strategies, *steps or actions taken by students to improve their learning*, that will enable you to learn words easier and remember them after you have learnt them.

1- '**Grouping**' is the first strategy that can help you remember new words better and for a longer period of time. By means of this strategy you can classify words into meaningful units either mentally or on a paper to make the retention process easier by reducing the number of discrete elements. Grouping can be done in a number of ways such as:

- 1- Type of words: all nouns or all verbs.
- 2- Topic: words related to a specific subject area.
 - Weather (hot - cold – rainy – stormy – windy - snowy)
 - Parts of body (hand – foot – nose – chest – leg - neck)
 - Vehicles (car – bus – cab – train – truck - lorry)
- 3- Similarities: (warm, hot, tropical)

Now, consider the following words and see how you can group them:

mortgage	mansion	dwell
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2- '**Making acronyms**' is another way to retain and remember new words by placing new words or expressions into a meaningful context such as spoken or written sentences or even a short story. Making acronyms, the abbreviation of several words in such a way that itself forms a word, can act as a new context. You may already have come across acronyms such as RAM (*Random Access Memory*) in Computer, FBI (*Federal Bureau of Intelligence*), NATO (*North Atlantic Treaty Organization*) and so on. To check your understanding of this strategy, now try to make an acronym with the words given below:

dignity	stable	adequate
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3- A good way to retain and remember vocabulary that have been heard or read in a new language is to create '**images**' of them either in the mind or in actual drawing. It can make mental images of objects like *house* and *tree* more concrete. Even abstract words like *evil* or *truth* can be turned into

symbols on a piece of paper for the purpose of retaining and remembering. In addition, this strategy could also be used for prepositions such as, *above*, *under*, *up*, etc. These pictures do not need to be artistic. Now, can you match the following words with the pictures?

herd	loop	summit
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