The Effect of Instruction in Deriving Word Meaning on

Incidental Vocabulary Learning in EFL Context

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Abstract

A solid body of research findings substantiates that most vocabulary, in first, second or foreign language, is acquired incidentally which is defined as learning vocabulary as a by-product of any activity not explicitly geared to vocabulary learning. Therefore, the present study mainly focused on the impact of instruction and intervention in deriving word meaning on incidental vocabulary learning in EFL context; secondly, it aimed to find out whether the contextualized words that appear with more clues   learned better and consequently kept longer; finally, it sought to explore whether instruction could lead to increase in incidental vocabulary learning in the text. To these ends, 50 freshmen Iranian college students from Teacher Training University of Azerbaijan participated in this study. These students enrolled for the reading class in two separate semesters. The results of the TOEFL and Vocabulary Level Test (VLT) revealed that the participants enjoyed approximately the same level of proficiency. There were two post-tests which were taken at certain time intervals. The results of this study showed that the instruction in deriving word meaning had positive effect on students' incidental vocabulary learning. Also it was concluded that students should meet the words in contextualized forms more frequently in order to keep and retain them in the long run.

Keywords: Incidental/intentional vocabulary learning, Implicit /explicit learning, Vocabulary Level Test

1. Introduction

It is postulated that teachers and students of second or foreign languages concur that vocabulary acquisition is an indispensable enterprise and goal of language learning and research into vocabulary learning for English as a foreign language (EFL) has received perceivable attention. Many research findings show that poor vocabulary frequently leads to incorrect inferences or misunderstanding of the content when reading English materials in their academic studies (Laufer, 2001; 1998; Gu, 2003; Huang, 2007; Nation, 2001). Researchers in the field of vocabulary acquisition concur with two major foci: acquisition through direct instruction of vocabulary (intentional) and incidental vocabulary acquisition through exposure to context (Hulstijn 2001; Nation, 2001). Intentional vocabulary learning refers to activities that aim at vocabulary development predominantly. But if vocabulary is learned predominantly through extensive reading, with the student guessing at the meaning of unknown words that do not have a predominant focus on vocabulary development, the activities are called incidental learning of vocabulary (Huckin & Coady, 1999; Robinson, 2005; Nakata, 2008). Research, teacher surveys and reading methodology textbooks since 1900 have consistently attested to the value of instruction related to word meaning from written context (Matsuda, 1987 cited in Fukkink, 2002). Students need effective strategies for coping with unfamiliar words during reading. Poor readers frequently have fewer strategies and need explicit instruction in deriving word meaning and meaningful strategies. Instruction to derive word meaning from context connects closely with the incidental word meaning hypothesis that students glean some word meaning from some unfamiliar words they encounter during reading (Fukkink, 2002). The previous studies have mainly focused upon the effectiveness of glosses on incidental vocabulary learning (Hulstijn, 1992, 1993; Hulstijn, Hollander, & Greidanus, 1996; Jacobs, Dufon, & Hong, 1994; Knight, 1994; Laufer & Shumueli, 1997; Mondria & Wit-de Boer, 1991; Paribakht & Wesche 1996, 1997; Watanabe, 1997), and on the effectiveness of the number of encounters needed to learn the words (Waring and Takaki, 2003; Webb, 2007). However, the present study seeks to firstly investigate the

effectiveness of instruction in deriving word meaning on the ability to recognize unknown words in the context. Secondly it aims to find out that contextualized words appearing with more clues are learned better and consequently kept longer, and finally to uncover whether this instruction would lead to increasing incidental vocabulary learning in the text.

2. Review of the Related Literature

There is no shortage of research attesting to the primacy of language vocabulary knowledge for language proficiency and/or supporting the hypothesis that in order to be able to transfer their first language reading strategies to second or foreign language text, second language learners must first attain a threshold level of vocabulary knowledge in the foreign language.Vocabulary knowledge is the most important component of second language (L2) reading comprehension, even more so than background knowledge and syntax (Laufer, 1997). It has been argued that most if not all vocabulary development (in the L1 or L2) occurs as learners attempt to comprehend written input (Krashen, 1993; Nagy, 1997). However, there still remain gaps in our knowledge about how various factors affect the process of acquiring vocabulary through reading. Research on second language reading and incidental vocabulary acquisition, or the phenomenon of "picking up" words as a by-product of reading, has found that vocabulary gains through reading are highly related to the level of comprehension attained from reading (Rott, 1997).

Incidental learning is the process of learning something without the intention of doing so. It is also learning one thing while intending to learn another (Schmitt, 2000). In terms of language acquisition, incidental learning is said to be an effective way of learning vocabulary from context. Incidental vocabulary acquisition research has verified the assumption that exposure to texts can contribute to L2, and also first language (L1) vocabulary growth, as all studies have found evidence of incidental vocabulary learning. Because learners incidentally gain knowledge of words in small increments, building upon their previous gains through repeated encounters until a word is known, incidental vocabulary learning can be a relatively slow process when there are long gaps between encounters (Webb, 2008). Currently it is not clear how many encounters are needed to learn an unknown L2 word. Hulstijn, Hollander, and Greidanus (1996) observed that there was little difference between encountering target words once or three times. By the same token, Rott (1999) proposed that six encounters may be sufficient to learn a word. Alternatively, Horst, Cobb, and Meara (1998) suggested eight encounters are needed, Saragi, Nation, and Meister (1978) concluded that 10 encounters, Webb (2007) suggested that more than 10 encounters are needed, and, in a similar line of inquiry, Waring and Takaki (2003) reported that it may take more than 20 encounters to incidentally learn the meaning of a word. Due to the vast controversies, there is still a need for research to substantiate the number of encounters needed for a word to be learned incidentally.

Ellis (1999) describes the distinction between incidental and intentional learning as follows:

> The distinction between incidental and intentional learning is based on the distinction between *focal* and *peripheral* attention. Intentional learning requires focal attention to be placed deliberately on the linguistic code (i.e., on form or form-meaning connections), while incidental learning requires focal attention to be placed on meaning (i.e., message content) but allows peripheral attention to be directed at form (pp. 45-46).

Therefore, any learning, whether intentional or incidental, can only take place with some degree of attention (Schmidt, 1994). By the same token, Hulstijn (2003) claims that intentional or incidental learning requires some attention and noticing. Attention is deliberately directed at committing new information to memory in the case of the former whereas the involvement of attention is not deliberately geared to an articulated learning goal in the case of the latter. Most scholars agree that except for the first few thousand most common words, L2 vocabulary is predominantly acquired incidentally (Huckin & Coady 1999; Robinson, 2005; Nakata, 2008). Gass (1999) suggests that words are more likely to be learned incidentally if (a) there are recognized cognates between the native and the target languages, (b) there is significant L2 exposure, or (c) other L2 related words are known.

A general problem with the operational definition of incidental vocabulary acquisition is that it seems to suggest that incidental learning occur unconsciously. Gass (1999) explicates that defining incidental vocabulary acquisition as the 'side-effect' of another activity neglects the active role of the learner in this process. Following Gass (1999), Rieder (2003) postulates the fact that incidental learning occurring as a by-product of reading does not involve any conscious processes (Rieder, 2003). Alternatively, Ellis (1994) criticizes the seeming equation of 'incidental' with 'unconscious'. He further states that incidental vocabulary acquisition is non-explicit in so far as it does not involve an explicit learning intention (the overall goal of the learner is text comprehension), but that neither the process nor the product of such learning is necessarily implicit in the sense of non-conscious.

Moreover, Rieder (2003) relates the terms implicit and incidental by viewing incidental vocabulary acquisition as being composed of implicit learning processes (which happen without the learner's awareness) and/or of explicit learning processes (which take place without learning intention but nevertheless involve online awareness and hypothesis formation). Ellis (1997) stipulates that both implicit and explicit learning mechanisms are involved in incidental vocabulary acquisition while the acquisition of a word's form, collocations and grammatical class information are said to involve implicit processes, acquiring a word's semantic properties and mapping word form to meaning are alleged to result from explicit learning processes and there is a complete dissociation of implicit (i.e. formal) aspects and explicit (i.e. semantic) aspects of vocabulary acquisition. Some researchers contend with Ellis' postulations and provide comments and reactions to his claims rather than presenting original viewpoints of their own. Singleton (1999: 153), for instance, criticizes Ellis' notion of dissociated processes, stating that even if learning forms and meanings of unknown words are initiated by different mechanisms, this does not necessarily imply that they are managed separately at all stages. Instead, Singleton would argue for a possible interaction between implicit and explicit systems.

There are potential benefits to word study programs that provide students with knowledge about word structure and strategies to infer the meanings of words. One reason is that not all students come to this understanding with ease. Students with language learning and reading disabilities are likely to be delayed, relative to their peers, in vocabulary development, including morphological knowledge and awareness (Fowler & Liberman, 1995; Windsor, 2000). Furthermore, students who are English language learners (ELLs) face particular challenges learning English vocabulary and benefit from instruction in word-learning strategies including morphological analysis (White, 2006). Leaving morphological analysis to be discovered by students on their own means that those who are in some way challenged by language learning are likely to be left behind their peers in the development of vocabulary, word reading, and reading comprehension. Word study programs that focus on morphology tend to do so for the primary purpose of either improving word reading and spelling or improving vocabulary. Most programs also include some amount of reading of natural texts. However, what is missing is assistance for students in learning how to use decoding and meaning-making strategies while reading. Unfortunately, poor readers are unlikely to use decoding strategies and comprehension strategies without considerable scaffolding to learn to apply these strategies during reading (Baker & Brown, 1984). They also need sufficient guided practice so that they see the value of the new strategies and use them relatively automatically as they encounter glitches in their understanding of texts they read on their own (Westby, 2004). In principle, struggling readers seem to need help to improve the inferential processes that will jointly support their learning of vocabulary during reading and their comprehension of texts.

Research, teacher surveys and reading methodology textbooks consistently attest to the value of instruction related to deriving word meaning from written context. It is widely acknowledged that native speakers of a language are able to derive the meaning of unknown words from context, and this ability accounts for a large part of a native speaker's vocabulary size (Walters, 2004). Second language learners are also apparently able to infer from context while reading (Horst, Cobb and Meara, 1998). Students in the middle grades encounter between 16,000 and 24,000 new words in the approximately million words of text they read annually (Nagy, Herman & Anderson, 1985). Graves (1986) estimated that students acquire on average between 1,000 and 5,000 words from context through the course of a school year .His findings also indicated that the vocabularies of students of high and low verbal ability grow at different rates, with the result that differences in vocabulary growth increase over the years. Thus, students could benefit greatly by an efficient strategy for determining word meaning from unfamiliar words.

It is still a controversial issue in language classrooms to see whether words can be inferred from contexts without being taught and instructed. For instance, Walters (2004) asserted that researchers, attempting to discover whether the ability to infer from context can be trained, tend to use one of the three methods of training: 1) teaching the use of an overall strategy to be used when encountering unknown words in text 2) instruction in recognizing and interpreting specific context clues found in text 3) developing awareness of context through practice with cloze exercises.

The first category investigates the effects of teaching a general strategy for coping with unknown word while reading. Camine, Kame'enui and Coyle (1984) propose three conditions: rule presentation plus systematic practice applying the rule, systematic practice only, and no intervention. In the rule presentation condition, subjects were given the rule 'When there's a hard word in a sentence, you look for other words in the story that tell more about the word.' (p. 197). Subjects were asked to apply this rule to the target word in the passage, and then choose one of four alternative meanings for the word. In the systematic practice only condition, subjects were asked only to choose one of four alternative meanings for the target word, without being told the rule. They were, however, told they could look back at the passage if they wished. The no-intervention group did not receive any training. Both the rule plus- practice and the practice-only groups performed better on the post-tests than the no-intervention the rule-plus-practice group and the practice-only group, suggesting that explicit statement of the rule did not contribute to these subjects' performance. The authors speculate that

this was the result of telling the practice-only group that they could refer back to the passage, thus inadvertently advising them to use context.

In a similar line of inquiry, Jenkins, Matlock and Slocum (1989) observed the effects of instruction in a general strategy. Their strategy involved substituting a word or expression for the unknown word, checking for context clues that confirm the substitution, asking if the substitution is supported by all context clues, considering the need for a new idea, and revising the original guess to fit the context. In L2 setting, Kern (1989) integrated reading strategy instruction into the normal curriculum of a semester-long university-level French class, focusing on word analysis, sentence analysis, and discourse analysis, which included explicit instruction in inferring meaning from context using a general strategy. Friedland (1992) compared traditional context instruction with a direct, process-oriented type of instruction, designed to increase subjects' ability to determine word meaning from context. It consisted of explicit instruction of the process of using context, modeled by the teacher, followed by guided practice, followed by practice and application. In the traditional context instruction condition, subjects practiced deriving word meanings from context independently, and then reviewed their responses through class discussion. Significant differences in ability to derive word meanings from context were found between groups that varied by the amount of practice, but no significant quantitative difference was seen between the two instructional groups. However, qualitative differences in interview responses were seen, revealing positive effects for the direct process oriented approach.

Van Daalen-Kapteijns *et al.* (2001) classified three activities for deriving word meanings from context as follows:

1) Text oriented: when the learner is concerned with the meaning of the word in order to keep the flow of understanding going.

2) Word oriented: when the learner is concerned with the use of contextual clues, morphological analysis of words, and rehearsal.

3) Vocabulary knowledge oriented: when the learner is mainly concerned with using the unknown word as an opportunity to improve his or her vocabulary knowledge and deals with the new word in order to derive knowledge, which can be integrated into semantic memory

However, due to lack of enough research on the impact of instruction in deriving word meaning, the present study sought to firstly investigate the effect of instruction in deriving word meaning on the ability of recognizing unknown words in the context capitalizing in the light of the model proposed by Van Daalen-Kapteijns *et al.* (2001), secondly it aimed to find out that contextualized words appearing with more clues are learned better and consequently kept longer, and finally to uncover whether this instruction would lead to increasing incidental vocabulary learning in the text.

3. Methodology

3.1 Research Questions

The present study intends to answer the following questions:

1) What is the effect of instruction in deriving word meaning on the ability to recognize unknown word in the context?

2) In relation to instruction, are contextualized words that appear with more clues learned better and consequently kept longer?3

3) Does this instruction lead to increasing incidental vocabulary learning in the text?

3.2 Participants

The participants in the present study consisted of 50 Iranian EFL students who enrolled at Teacher Training University of Azarbaijan. Their age range was between 22and 25.There were two reading classes each of which involved 25 students. The results of the TOEFL and Vocabulary Level Test (VLT) revealed that the participants enjoyed approximately the same level of proficiency. None of the participants have had any opportunity to live abroad.

3.3 Instruments

3.3.1 English TOEFL test

In order to determine the proficiency of students in both classes, first of all a TOEFL test was administered. Since our major concern here was on vocabulary, the test was tailored to focus more upon checking the knowledge of those parts which may have influence on the results indirectly including reading, vocabulary, and grammar. Other skills were not considered in the test because they were not relevant to the area of our research, and the number of questions was 80.

3.3.2 Vocabulary Level Test

In order to determine the effect of instruction in deriving vocabulary on incidental vocabulary learning, we need to

obtain a homogeneous group of subjects in terms of their vocabulary knowledge. It is done by administering a version of Nation's Vocabulary Level Test (VLT).The test specifies the vocabulary in different categories. Categories involve the most frequent vocabulary in different levels. (e.g. 1000, 2000, 5000, academic level, 10000).Each testee tries to answer the vocabulary test and the score in each category would be an indicator of students knowledge in that area. In each level, we chose the words that 80 percent of the students were not able to answer. The selected words were applied in the contextual form to test the effect of instruction taught before learning the words incidentally. In terms of validity, the test has been validated by Schmitt *et al*. (2001).

3.3.3 Pre-test and post-test

The pre-test involved 20 difficult words that 80 percent of the students could not answer in vocabulary level test. The students' scores for these words were compared with post-tests. There were two post-tests. The first post-test was taken immediately after the treatment. The test was extensively piloted with a group of eight subjects of similar ability and background. It was 20-item multiple-choice test which was contextualized and students needed to derive the meaning of each of them and choose the best answer for each question. The second post-test occurred 30 days after the first post-test. The second post test involved three tests adopted from Waring and Takaki (2003). They were: 1) a word-form recognition test; 2) a multiple-choice (prompted recognition) test; and, 3) a meaning by translation (unprompted recognition) test. The three tests were also extensively piloted with a group of eight subjects of similar ability and background. These subjects were not part of the main study. To avoid confusion with partially known or known L2 items, the spellings of the disguised forms did not always conform to common L2 spellings. The aim of the piloting was to confirm that the tests contained enough words and the text was not too long and could be read in about an hour at a reasonable reading speed. (For more on these tests see Waring and Takaki, 2003).

3.3.4 Vocabulary Profile

In order to make sure that the vocabulary level of the reading texts corresponds to the participants' vocabulary level (already determined by VLT), a computer program called Vocab Profile(VP) was used to perform lexical text analysis . The texts were those used in the proficiency level test at the beginning of the study to make us sure that they were approximately at the same level of with students' 'knowledge of vocabulary'. It was divided into four categories by frequency (1) the 1000 frequent words of English (2) the 2000 frequent words (3) the academic words of English and (4) the remainder which was not found on the other lists.

3.3.5 Instructional program

The goal of the instructional program was to improve meaning derivation skill and establish transfer to incidental word learning including learning a strategy to deal with both simple and complex words in textual contexts with varying degrees of contextual support. Participants in the experimental group received 6 sessions of treatment. The instructions were adopted from Van Daalen-Kapteijns *et al.* (2001) who classified three activities for deriving word meanings in the text as follows:

1) Text oriented: it occurs when a person is mainly concerned with understanding the whole text passage around the unknown word and only deals with the word's meaning to keep the flow of comprehension going. Two text-oriented activities are substitution and checking. Although text-oriented activities are primarily meant to reach understanding of the text at hand, they would also increase students' vocabulary knowledge incidentally.

2) Word oriented: word-oriented activities are the use of contextual clues, morphological analysis of words, and rehearsal. Activities involved in using contextual clues have been the focus of many programs aimed at improving students' strategies to enhance their word knowledge. Morphological analysis of words is an activity that students engage in when they notice familiar elements in the form or features of unknown words (Anglin, 1993).Rehearsal of derived meaning is a third word-oriented activity. It is often advocated during periods in which students encounter large numbers of words (Mondria, 1996).In educational practice, rehearsal is simulated by instructing students to make notes of recently encountered words and word meanings in a personal vocabulary booklet. Unknown words that occur in context and are singled out for closer inspection become familiar and linked to domain of meaning (Goerss, Beck, & McKeown, 1999). It occurs when a person is mainly concerned with detecting the contextual meaning of the unknown word and deals with the context in order to find out what the word means here.

3) Vocabulary knowledge oriented: it occurs when a person is mainly concerned with using the encounter with the unknown word as an opportunity to improve his or her vocabulary knowledge and deals with the new word in order to derive knowledge, which can be integrated into semantic memory. Both text-oriented and word-oriented activities contribute to student's vocabulary knowledge, but are not labeled "vocabulary knowledge-oriented". This term has been kept in reverse for activities that are specifically related to building paradigmatic word knowledge. Word knowledge is

called paradigmatic when words not only are related to the context in which they are used and to experientially based concepts, but become organized within domains of related words (Bloom& Gleitman, 1999; Nelson, 1983). Paradigmatic representations help build conceptual networks and vocabulary knowledge that is well structured, i.e., effective, coherent, and parsimonious (Alderson & Nagy, 1992; Graves, 1987).

A pilot study of the instructional program had been conducted at two institutes (Mahan and Alavi) not involved in the formal study, where one class of students participated. The activities involved three steps: (1) Students were encouraged to apply the strategy during actual reading; (2) They looked for unfamiliar words during reading; (3) They gleaned their meaning from context.

4. Results

To test the effectiveness of instruction in deriving word meaning on incidental vocabulary learning, we administered the TOEFL proficiency and vocabulary level test to determine the level of homogeneity of the experimental and control group. The proficiency test involved 80 multiple-choice tests of vocabulary, grammar and reading. The vocabulary level test also involved most-frequently used vocabulary words in different levels. The pre-test and post-test included 20 words which 80 students could not answer in vocabulary level test(VLT). They were tested once as pre-test and twice as post-test.

In order to homogenize the sample of 60 students, first we used the individual control chart. The individual control charts for 60 students in TOEFL examination and VLT are shown in Figures 1 and 2.

< Figures 1 &2 about here>

A descriptive statistics for quantitative variables was represented to investigate the resulting data on minimum and maximum scores, sum, mean, standard deviation, and variance of the scores and the mean performances in pretest and posttest both in control and experimental groups. (See Tables 1 and 2).

< Tables 1 and 2 about here>

Table 2 presents the mean scores of the groups which were compared in order to find out whether the two groups were homogeneous regarding their vocabulary gained through pre-test. As it can be seen in Table 2, the mean and standard deviations for both groups are approximately the same, so they were regarded homogeneous.

Table 2 also presents the results of an independent samples t-test to compare the vocabulary gain of the control and the experimental groups in the pre-test. As it can be seen, there was no significant difference in the scores for the experimental group and the control group, $t(48) = 0.4$, $p < 0.05$. The results indicate that there was no difference between mean performances of the two groups in the pre-test; therefore, it can be concluded that there is no difference in the vocabulary gain of the two groups and they were homogeneous.

4.1 Results and Discussion for the First Research Question

In order to investigate the effectiveness of instruction in deriving word meaning on the ability to recognize unknown words in the context, the post-test was administered. As it can be seen in Table 3, the control group's mean score is 5, while the experimental group's mean score is 8.84. The difference indicates that the experimental group outperformed the control group in deriving word meaning from context.

< Tables 3 and 4 about here>

Table 4 also presents the results of an independent samples t-test to compare the vocabulary gain of the control and the experimental groups in the post-test. As it can be seen, there a significant difference in the scores for the experimental group and the control group, $t(48) = 0.0$, $p < 0.05$. The results indicate that there was a significant difference between mean performances of the two groups in the post-test; therefore, it can be concluded that the experimental group outperformed the control group in learning words and driving words from context.

4.2 Results and Discussion for the second and Third Research Question

As to the second question which seeks to find out whether contextualized words that appear with more clues are learned better and consequently kept longer, and the third question aiming to explore the effect of instruction in increasing incidental vocabulary learning in the text, the results of the second post test indicate (As shown in Tables 5 & 6) instruction was really effective in the retention and increase in incidental vocabulary learning.

< Tables 5 and 6 about here>

As it can be seen, the mean of the experimental group was higher than the mean of the control group, so it is concluded that the experimental group outperforms the control group after instruction. Based on the results presented in Table 5, it can be argued that the experimental group outperformed the control group.

As indicated in Table 6, an independent samples t-test was conducted to compare the vocabulary retention of the control and the experimental groups for the second post-test. As it can be seen in Table 6, $t(48) = .00$ $p < 0.05$, so it is concluded that the experimental group did better in the second post test. Therefore, it is then recapitulated that instruction was really effective in the retention of vocabulary items.

5. Conclusion

The present study was carried out in order to provide empirical evidence on the effect of instruction in deriving word meaning on incidental vocabulary learning. In doing so, results provided evidence that the higher a learner's awareness of instruction in deriving the word meaning, the higher the ability to recognize unknown word in the context. secondly, it was concluded that contextualized words that appear with more clues learned better and consequently kept longer; finally, the paper shed light on the fact that instruction could lead to increase in incidental vocabulary learning in the text.

6. Pedagogical Implications

The findings of this study have some implications in the field of foreign language teaching. One of the most important implications is in the area of teaching and learning. It demands us to make students explicitly aware of clues in finding the meaning of the words in the class in order to find the chance of increasing the amount of vocabulary learning from the text. Also we should teach the students to have short gaps between the encounters of the words because incidental vocabulary learning can be a relatively slow process when there are long gaps between encounters and learners incidentally gain knowledge of words in small increments, building upon their previous gains through repeated encounters until a word is known.

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Table1. Descriptive statistics for vocabulary score in pre-test

		Vocabulary score for Control group in pre-test	Vocabulary score for Experimental group in pre-test
N	Valid	25	25
	Missing	35	35
Mean		4.36	4.04
Median		4.00	4.00
Mode		3	3

Std. Deviation	1.350	1.369
Variance	1.823	1.873
Range	5	4
Minimum	2	2
Maximum	7	6

Table 2. Independent samples t-test for the pre-test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Pre-test Score out Of 20	Equal Variances Assumed	.052	.820	.832	48	.409	.32000	.38453	-.45316	1.09316
	Equal Variances Not assumed			.832	47.991	.409	.32000	.38453	-.45316	1.09316

Table 3. Descriptive statistics for scores of control and experimental group in post test

		Deriving Word Meaning For control Group in Post test 1	Word form Recognition For control Group in Post test 2	Multiple Choice for Control Group in Post test 2	Meaning By Translation For control Group in Post test 2	Deriving Word Meaning for Experimental Group in Post test 1	Word form Recognition For Experimental Group in Post test 2	Multiple Choice for Experimental Group in Post test 2	Meaning by Translation For Experimental Group in Post test 2
N	Valid	25	25	25	25	25	25	25	25
	Missing	35	35	35	35	35	35	35	35
Mean		5.00	3.00	2.84	2.32	8.84	6.12	6.16	5.88
Median		5.00	3.00	2.00	2.00	9.00	6.00	6.00	5.00
Mode		5	2[a]	2	0	9	6	6	5
Std. Deviation		1.528	2.041	1.993	1.909	2.075	2.088	2.779	2.934
Variance		2.333	4.167	3.973	3.643	4.307	4.360	7.723	8.610
Range		5	9	7	6	7	7	11	14
Minimum		3	0	0	0	6	3	3	0
Maximum		8	9	7	6	13	10	14	14

a. Multiple modes exist. The smallest value is shown

Table 4.T-Test for deriving word meaning (post-test1)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Deriving Word Meaning Post test	Equal Variances Assumed	2.922	.094	-7.451	48	**.000**	-3.840	.515	-4.876	-2.804
	Equal Variances Not Assumed			-7.451	44.105	.000	-3.840	.515	-4.879	-2.801

Table 5. Descriptive statistics

Group		N	Mean	Std. Dviation	Std. Error Mean
Post test 2	Control group	25	2.7200	1.15000	.23000
	Experimental group	25	6.0532	1.90876	.38175

Table 6. Independent samples t-test for the second post test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Post test 2	Equal Variances Assumed	4.046	.050	-7.479	48	.000	-3.33320	.44568	-4.22931	-2.4371
	Equal Variances Not Assumed			-7.479	39.395	.000	-3.33320	..44568	-4.23439	-2.4320

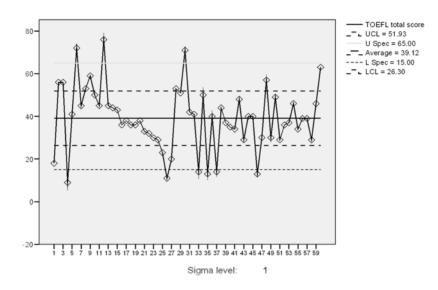**Control Chart: TOEFL total score**

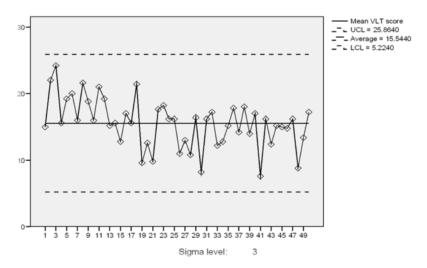Figure 1 .Individual control chart for homogeneity of learners

Control Chart: Mean VLT score

Figure 2 Individual control chart for homogeneity of learners