

The Effect of Hemispheric Dominance on Learning Vocabulary Strategies among Iranian EFL Learners

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Abstract

Vocabulary is one of the skills that students need for success in their studies and as some teachers believe, the students have different vocabulary skills and they use different strategies when they try to recall new vocabularies. The purpose of the study is to investigate the variable impact of two types of vocabulary instruction including context clues, and word parts on adult students' competence in the first place and studying the relationship between the effect of left or right hemispheric dominance on teaching vocabulary learning strategies. Ninety students from six intact classes were selected for the purpose of this study. The participants consist of female Iranian EFL learners at intermediate level. Each intact class was randomly selected as an experimental group and a control group. Their level of English proficiency was determined on the basis of their scores on the TOEFL proficiency test. After hemispheric dominance questionnaire was administered, the learners in experimental group were divided into right-hemisphere and left-hemisphere group. The experimental group were taught context clue and word part vocabulary strategy while it was not the case for the control group. The results showed that teaching vocabulary strategies play a significant role in developing the level of the learners' vocabulary knowledge. Furthermore, left-dominant learners had better performance in learning vocabulary after they were taught vocabulary strategies, in comparison to right-dominant learners. As a conclusion, it can be said that investigating hemispheric dominance and learning styles from the aspects of curriculum, teaching process and teachers will contribute significantly to the Iranian Education.

Key words: Learning strategies, vocabulary learning strategy, strategy training, hemispheric dominance, EFL.

1. Introduction

Many researchers and linguists make great effort to find out the most effective vocabulary instruction and learning strategies that can help students improve word power. In language learning, vocabulary acquisition definitely plays an important role as Wilkins (1972) pointed out that 'without grammar very little can be conveyed, without vocabulary nothing can be conveyed' (p.111). Learners need to have a bank of lexical items in order to express themselves as part of and throughout the learning process. They also have to know how to master the essential lexical items. Nevertheless, vocabulary learning is often seen as the greatest source of problems experienced by second language

learners. Learners feel that an inadequate vocabulary is the reason for a lot of problems they face in both receptive and productive language use (Nation, 1990). Given such a critical role that vocabulary learning plays in second language acquisition, further investigation into learners' approaches and perception towards learning vocabulary is worthwhile. Many researchers and linguists make great effort to find out the most effective vocabulary instruction and learning strategies that can help students improve word power. In language learning, vocabulary acquisition definitely plays an important role as Wilkins (1972) pointed out that 'without grammar very little can be conveyed, without vocabulary nothing can be conveyed' (p.111). Learners need to have a bank of lexical items in order to express themselves as part of and throughout the learning process. They also have to know how to master the essential lexical items. Nevertheless, vocabulary learning is often seen as the greatest source of problems experienced by second language learners. Learners feel that an inadequate vocabulary is the reason for many of their problems in both receptive and productive language use (Nation, 1990). Given such a critical role that vocabulary learning plays in second language acquisition, further investigation into learners' approaches and perception towards learning vocabulary is worthwhile.

In addition to teaching students with a wide range of abilities within already overcrowded classrooms, accommodating students with learning differences, and dealing with behavior problems, teachers now have to add teaching English to their duty roster. As a result, mainstream classroom teachers are in need of research-based instructional techniques to use in English as a Foreign Language (EFL) instruction. With these challenges in mind, districts must decide on which is more beneficial to students' success: to hire more interpreters and buy more bilingual materials or to teach mainstream teachers explicit strategies for second language vocabulary acquisition.

The theory of hemisphericity that gain upsurge interest in the recent years, refers to idea that people may rely on preferred mode of cognitive processing, which is linked to the activity on the part of the left or right cerebral hemisphere. Over the recent years, following a tremendous interest of studies of specialization of the cerebral hemispheres, there has been an increasing tendency toward the concept of hemisphericity. Even though the term may applied differently by different writers, it is generally associated with the mode of cognitive processing which in turn implies the predominant activity either the left or the right cerebral hemisphere.

On the top of all, the characteristic of hemisphericity has been attached with a number of aspects of personality, including reasoning, thought, and abnormal states. Most of the works in this area are related to educational and cognitive developmental aspects (Joseph, 1982; Kelin, Allen & Schwartz, 1998).

Hemisphericity has therefore been considered to be relevant in the different areas of education such as second or foreign language learning and acquisition. Undoubtedly, there are lateral differences between the cerebral hemispheres in the organization of human performance (Prince, 1978).

On the other hand, as the child's brain matures, various function become lateralized to the left or right hemisphere. The left hemisphere is associated with logical, analytical thought, with mathematical and linear processing of information. The right hemisphere perceives and remembers visual, tactile, and auditory images, it is more efficient in processing holistic, integrative, and emotional information. Torrance and Reynolds (1980) and Krashen, Seliger, and Hartnett (1974) found support for the hypothesis that left-brain-dominant second language learners preferred a deductive style of teaching, while right-brain-dominant learners appeared to be more successful in an inductive classroom environment.

1.2. Statement of the problem

The educational implications for adolescents with limited vocabulary are profound. Since the strong correlation between comprehension ability and vocabulary knowledge has been established, vocabulary knowledge is vital for academic success (Baker, Simmons, & Kame'enui, 1998; Cunningham & Stanovich, 1998). Vocabulary proficiency is considered to be both a precursor to reading comprehension and an outcome of it (Bromley, 2007). Students who do not have sufficient vocabularies or word-learning strategies continue to struggle throughout their educational careers, which leads to a cycle of frustration and continued failure (Hart & Risley, 2003; Snow, Barnes, Chandler, Goodman, & Hemphill, 2000). Furthermore, the vocabulary level of an individual is viewed as a means of unlocking or closing access to information and often illustrates whether a person is considered educated (Beck & McKeown, 2007; Stahl & Nagy, 2006).

Vocabulary is one of the skills that students need for success in their studies and as some teachers believe, the students have different vocabulary skills and they use different strategies when they try to recall new vocabularies. One of the first problems a foreign language learner encounters is how to commit a massive amount of foreign words to memory. And the first and easiest strategy people pick up and use naturally is, simply, repeating new words until they can be recognized. It is therefore not surprising to see most of the earlier research focusing on various aspects of vocabulary rehearsal. This section on vocabulary rehearsal strategies is deliberately short, not because rehearsal is unimportant, or empirical studies are specifically limited in number, but because 1) most studies done on various aspects of vocabulary rehearsal were carried out before the 1970s; 2) later studies have focused on some "deeper" strategies; 3) empirical research in this aspect has produced relatively conclusive results, and 4) a review of these studies can be found in Nation (1990).

In spite of the fact that students can benefit from being provided with various types of vocabulary strategies that attempt to guide learners to the target language, sometimes learners can be dissatisfied with a language class because of mismatches between students' and teachers' expectations and techniques. Learners' hemisphericity in terms of being right dominant or left dominant may be essential to effective L2 acquisition. Schulz's (2001) study found that learners' perceptions, interpretations, and hemisphericity that affect learners' style and strategy of learning, have the greatest influence on their achievement. Thus, understanding students' perceptions and style of learning can be the first step toward leading them to acquire new words. As Brown (2007) points out, "L2 teachers and their students may have similar or disparate notions of effective teaching" (p. 46). Therefore, it is important for teachers to know their learners' preferences for teaching different types of vocabulary strategies in order to maximize its potential positive effect on language development.

Regarding the above-mentioned issues, the present researcher seeks to find out the effect of vocabulary strategies training and to see whether there is any relationship between any relationship between the effect teaching vocabulary leaning strategies and left or right hemisphere dominance.

1.3. Significance of the study

This study will have the potential to inform and guide content area pedagogy. Educators are searching for instructional approaches to address the gap that exists in vocabulary knowledge between high and low-performing readers. This research has the potential to influence the way vocabulary is taught by providing a strategy that encompasses the components of rich instruction designed to help students deepen and broaden their understanding of word meanings.

In addition, in tandem with the developments in learning strategies, particularly studies in vocabulary strategies, the new elements of vocabulary strategies have been introduced to the field of SL pedagogy. The importance of teaching vocabulary strategies has been recognized widely in second / foreign language learning, but as far as I am concerned no experimental study in foreign

language setting seems to have dealt specifically with teaching vocabulary strategies to left and right dominance hemisphere in Iranian context.

By considering the above-mentioned issues, the present study examines teaching some vocabulary learning strategies among young learners at one of the English institutes in an Iranian EFL context. Findings and implications will provide relatively new insights for teachers working in these settings. Most of the past studies described learners' use of strategies and did not relate to the effects of strategy training. The present study aims to find out the effects of vocabulary strategy training on hemisphericity. If it follows that strategy training does have positive effects on learners, which affirms that vocabulary learning strategies can be taught and learnt, the implication will be that it is worthwhile to put more emphasis on learning to learn vocabulary in the language classroom. To teachers, vocabulary was too vast a quantity for direct instruction. If learners can deploy strategies for independent vocabulary learning both inside and outside classroom, their vocabulary banks can increase. Teachers' role in facilitating left- and right-dominant hemisphere through introducing strategies will be ascertained. It will thus provide us with clearer directions of vocabulary instruction in classroom context. It is believed that more skillful learning of vocabulary through the use of learning strategies fuels the process of second language learning and learning outcomes.

1.4. Purpose of the Study

The purpose of the study is to investigate the variable impact of two types of vocabulary instruction including context clues, and word parts on adult students' competence in the first place and studying the relationship between the effect of left or right hemispheric dominance on teaching vocabulary learning strategies.

1.5. Research questions

The present study investigated the effect of vocabulary strategy training on the retention of new vocabularies and to see whether left or right hemispheric dominance play any role on teaching vocabulary strategies. Regarding these objectives, the following questions were suggested:

1. Does teaching vocabulary strategies help Iranian EFL learners in retention of vocabulary?
2. Does left or right hemispheric dominance play any significant role on teaching vocabulary strategies among Iranian EFL learners?

1.6. Research Hypotheses

This study also suggested the following null hypotheses:

H1: Teaching vocabulary strategies cannot help Iranian EFL learners in retention of vocabulary.

H2: Hemispheric dominance cannot play any significant role on teaching vocabulary strategies among Iranian EFL learners.

2. Review of Literature

2.1. Vocabulary instruction

Vocabulary research began in the early 1900s by researchers like F. Davis and G. Whipple, but it has been erratic. Interest peaked in vocabulary research in the 1970s, but there has been a resurgence of interest since the No Child Left Behind legislation identified vocabulary instruction as one of the five required components of Reading First programs (U.S. Department of Education, 2003). After being charged with reviewing the research in reading instruction and identifying methods that consistently relate to reading success, the NRP confirmed vocabulary as one of the five central areas of reading instruction (NICHD, 2003).

Vocabulary can be broken down into four categories. Listening vocabulary is the vocabulary an individual hears and comprehends. Reading vocabulary is the vocabulary an individual is able to

read and understand. Speaking vocabulary is the vocabulary an individual is able to use in communicating with others. Writing vocabulary is the vocabulary an individual uses when writing. It is a natural progression that individuals can recognize more words in listening and reading than they produce in their speaking and writing (Harp & Brewer, 2005). This suggests a classroom rich with meaningful readings and discussions is essential to build the confidence of students and their flexibility in transferring their vocabulary to speaking and writing. Students learn words both indirectly and directly. Students learn words indirectly or incidentally through the experiences they have on a daily basis with oral and written language. Students learn words directly when they are provided with specific word instruction and are taught specific word-learning strategies (NICHHD, 2003). While there is no one best method to incorporate into vocabulary instruction, there are a variety of suggestions, some more effective at stimulating vocabulary growth and competence over a short duration.

2.1.1 Context Clues

One of the components of direct explicit instruction is to explain how to use context clues to determine the meanings of unknown words. Francis, Simpson, and Stahl (2004) refer to this as a generative approach that emphasizes the importance of creating lifelong learners of words by teaching such techniques as context clues to unlock the meaning of words on an independent basis. Context clues can be provided in a variety of ways through synonyms, antonyms, general contexts, or examples. Context clues contained in the paragraphs surrounding the unfamiliar words can promote word learning (Sternberg, 1987). "Teaching students how to use context to determine a word's meaning should be an important component of a comprehensive vocabulary program" (Graves & Watts-Taffe, 2002, pp. 143-144). With the exception of general context clues that use common sense, the other clues may provide readers with punctuation marks or key words that indicate they will get a synonym, antonym, or example of the unknown term to help them unlock the meaning. One example is, "Please pick up the "refuse" or "garbage" in front of the house" or "She offered the man a modicum of gratitude for his hard work instead of the significant amount of gratitude he deserved."

While teaching context clues is beneficial, in some cases there are not enough clues provided to aid the reader in identifying the unknown word or, as Scott and Nagy (2003) found, the use of context clues may be helpful only across multiple encounters with words. In a study by Wang (2006), students demonstrated a general weakness in word knowledge and an inability to make sense of the target words by means of contextual clues. This could indicate that the text being read has too many challenging or unknown words or that an understanding of how to use context clues is unknown. If students are provided with "refuse" as a synonym for "debris," neither word may be in their existing schemata, making it difficult if not impossible to unlock the meaning. The term "refuse" is also a homograph, which further confuses the meaning of the text.

Context clues are not always sufficient and may require a fair degree of background knowledge before they can be effective learning tools (Sinatra & Dowd, 1991). Relying strictly on context clues to determine the meaning of unknown words can present major obstacles for second language learners who may not be able to connect with the text.

Another study that challenges the effectiveness of using context clues is the work of Francis and Simpson (2003). Their research found that many students struggle with determining the meaning of unknown vocabulary because of the amount of information contained in the text. Additionally, these students will skip key words they think that they know, but their word knowledge is superficial or at a rote level where the use of context clues are less effective.

2.1.2. Word Parts

A powerful approach to direct explicit instruction is to teach students the strategy of using roots and affixes to determine the meaning of morphologically complex words. Teaching words parts is an extension of using context clues to unlock the meaning of unknown words. Beginning in the early elementary grades and continuing into the college years, teaching root words and affixes is a primary strategy that is used to increase one's knowledge of difficult vocabulary (Larsen & Nippold, 2007).

A study by Anglin (1993) on vocabulary growth between first and fifth grade showed an increase of approximately 4,000 root words by students. At the same time, the number of derived (prefixed or suffixed) words grew by about 14,000 words. An excellent example of how easy it is to get to the meaning of new or unknown words can be seen in the basic instruction of the prefix, "a," meaning "not" in the word atypical. Experience demonstrates that virtually every student knows the meaning of typical, but not atypical. The focus on root words and affixes helps them to see how to unlock the meaning of new and unknown words in the future. According to White, Sowell, and Yanagihara (1989), there are 20 prefixes that account for 97% of prefixed words that appear in printed school English (p. 42). In Spanish, French, and English, the root, "..dur.." means "hard" or "lasting." Including root word and strategy instruction can be extremely valuable to native speaking English students, as well as students who have a first language that is not English, but this methodology is built on Greek or Latin cognates. Many of the romance languages have the infrastructure of their language developed around Greek and Latin. Additionally, the English language shares many cognates with other languages where words have similar meanings, pronunciations, and spellings which can aid in determining the meaning of unknown words (Nagy & Scott, 2000). Unfortunately, those second language students who do not have a first language based on Greek or Latin, may not find as much success with this vocabulary instruction.

The use of cognates to develop literacy and specifically vocabulary is rooted in education strategies that reach back to the Middle Ages. For example, the methodology of the Ratio was a threefold process of stating an instruction or rule (e.g., Latin cognate and their impact on developing vocabulary), which the teacher explained or demonstrated with the cooperation of the class, and then applied in an exercise in a laboratory setting (Farrell, 1938). There was a supposition with the Ratio that wide reading alone would not lead to mastery of any language and that without the assistance of the teacher, the student would adopt pernicious practices. The implication is that teaching reading and teaching vocabulary must expand beyond the power to read and understand the English language.

3. Methodology

3.1. Participants

Ninety students from six intact classes were selected for the purpose of this study. The participants consist of female learners at intermediate level from Safir English institute. Participants had a mean age of 20. Each intact class was randomly selected as an experimental group and a control group. Their level of English proficiency was determined on the basis of their scores on the TOEFL proficiency test. Those whose scores were between one standard deviation score above the mean and one score below the mean were selected for the main study. Because some of the students were absent during the implementation of one of the tests, they were excluded from the main participants resulting in 67 students. Later, the researcher administered a hemisphere dominance questionnaire survey developed by McCrone to determine left hemisphere vs. right hemisphere dominant learners. The questionnaire included 16 items. As the current study focused on the effect of hemisphere do-

minance on vocabulary strategy training, only the left and right-dominants of the experimental group were taken into consideration for data analysis. After administering the inventory, it was shown that 15 of the participants were left hemisphere and 20 of students were right hemisphere dominant students.

3.2. Instrumentation

3.2.1. Vocabulary Quizzes

The pre- and post-test as well as the instructional vocabulary quizzes to be used were designed by Amy Olsen and published in *Active Vocabulary: General and Academic Vocabulary*, 3rd edition by Pearson Longman. The chapters used were chapters 10, 12, 16, and 18. Each chapter has two sets of traditional vocabulary quizzes that follow a cloze-statement format. One of the quizzes from each chapter was used for the pretest and post-test and other quizzes were used as the instructional vocabulary quiz immediately after instruction. All of the quizzes included cloze-type statements on all of the words and required the participants to select from one of four words for completion. The pretest and post-test mimic the individual quizzes; however, the pretest and post-test included 30 cloze-type statements and the individual quizzes contain 10 cloze-type statements each.

A pilot study was conducted on the words to ensure that a larger percentage of each group of 10 words is not known by the student population prior to their use in the proposed study. This ensured an equal degree of difficulty of the three groups often words. Additionally, a pilot of the instructor scripts for the types of vocabulary instruction was completed to ensure their viability with community college developmental reading students. The pilot was conducted with a random group of students who had similar characteristics.

The reliability and validity of the word selection were tested in a pilot study. Each set of 10 words was tested in a cloze-statement activity. Boote (2006) suggests in examining the validity of good words to teach, that words known by 40%-80% of the population are words worth teaching. She indicates that words known by less than 40% of the population are not worth teaching nor are the words known by over 80% of the population, suggesting, possibly, that those under 40% may be too difficult and not within an instructional range and that those over 80% are already known or are within grasp that the student will acquire independently. This presents one perspective on how to identify words worth teaching, but it is a contrast to the theoretical framework that supports this study. This study is based on a Vygotskian social constructivist approach which theorizes that learning is based on social interaction between peers and teachers that allow the individual to construct meaning around or within existing schemata which allows for acquisition and growth. The ZPD suggests that what is unknown may be within grasp if it is instructed by a more capable peer or others. Those words that are known by less than 40% of the population may be within the ZPD of the individual and therefore worth teaching, but caution should be used in assuming all students will acquire the words as some students do not have the existing schemata to build around the word

3.2.2. Hemisphere dominance questionnaire

The hemisphere dominance questionnaire survey developed by McCrone to determine left hemisphere vs. right hemisphere dominant learners. The questionnaire included 16 items. According to this questionnaire, those participants whose left total score based on brain dominance test is above or equal to 10 are considered as left hemisphere dominant and learners whose right total score is above or equal to 10, are treated as right hemisphere learners. Lastly, those whose sum of total scores are below 10, are regarded as balanced hemisphere learners.

3.3. Procedure

After receiving formal consent from each student and the instructor, in order to answer the research questions, a quantitative study was used. In the first stage of the study, a 30 word vocabulary

pretest was used to identify the level of vocabulary knowledge for participants. In the next stage of the study, two different vocabulary instructions were used to teach 30 words. The 30 words were grouped by 10 for each of the two types of vocabulary instruction including word parts (prefixes and suffixes), and context clues or guessing meaning from context. After the students were taught the vocabulary instruction, an instructional vocabulary quiz on the 10 words was administered after training. In the third stage of the study, the pretest was re-administered as a post-test to measure growth and retention.

Regarding the two methods of vocabulary instruction, the 30 words were split into three groups of 10 words and were taught two types of vocabulary instruction including word parts (prefixes and suffixes), and context clues or guessing meaning from context. The instructor used the instructions provided by the researcher for the 30 vocabulary words. Each passage introduced the 10 new words in context.

As far as the first method of instruction is concerned, the instructor taught the new vocabulary using word parts/word families. "Most students understand the importance of context—they know that words have meaning in relation to other words in a sentence. But not so many understand that words also derive meaning from their component parts" (Dale, O'Rourke, & Bamman, 1971, p. 92). In this method, the instructor introduced the students to the words and the students used morphemic analysis to identify familiar or easily analyzable parts (Alvermann et al., 2007).

For the purpose of this study, the teacher first provided the students with a list of the 10 words and then directed the student to use morphemic analysis to identify any free morphemes (words that can stand alone) and provide the meaning. Next, students looked for familiar or easily identified word parts that indicated a specific meaning. Once the students exhausted the possibilities for specific meaning in a word, the teacher gave the students a word parts/word families hand-out to assist them in determining meanings of words that they were not able to identify earlier. The handout was broken down into three parts: word parts, meanings, and word derivations. The word derivatives provided a list of words using the same base, root, prefix, or suffix, which affords students with an opportunity to transfer meaning to an unknown word to identify its meaning. Dale et al. (1971) believe word parts should be taught from the known and applied to the unknown. This method allowed students to make their own generalizations about words based on their inferences. Students worked together as a class to determine and write down the meaning of the new words. Once students agreed on a meaning, students worked collaboratively in small groups to learn the meaning(s) and ways to use the word in different contexts. At the end of class, the teacher administered the instructional vocabulary quiz.

The use of context clues was the second method of instruction. Dale et al., (1971) identify this as the reader determining the meaning of an unfamiliar word by how it was used in context and without looking it up in a dictionary. The instructor presented the students with a passage titled Renaissance Periods introducing 10 new words. The teacher read the passage to the students and asked the students to use one of different methods of using context clues to determine the meaning of the word. The students wrote down all 10 words and their meaning as used in the passage. Once students agreed on the meaning of all 10 words, they worked collaboratively in small groups discussing the meaning(s) and ways to use the word in different contexts. At the end of class, the teacher administered the instructional vocabulary quiz.

After the students in both left-dominant and right-dominant group were taught by two vocabulary strategies, they were given a posttest to see whether the intervention program played the same or different roles for left-dominant and right-dominant group.

4. Results and Discussion

4.1. Research Questions

The present study attempts to answer the following questions:

Q1: *Does teaching vocabulary strategies help Iranian EFL learners in retention of vocabulary?*

H01: *Teaching vocabulary strategies cannot help Iranian EFL learners in retention of vocabulary.*

Before data analysis, we should know that, for all statistical analyses in this study, .05 was used as the alpha level at which findings were considered to be significant. Several statistical tests were employed to address the different research questions. The data were analyzed using the Statistical Package for the Social Sciences (SPSS 14) software package to identify statistically significant relationships on targeted vocabulary quizzes and between vocabulary pretest and posttest within the groups who received the three types of vocabulary instruction.

However, before doing any analysis, we should know whether we are able to use a parametric test or not. Therefore, we should check whether the data have been normally distributed or not. If the level of significance is more than 0.05, it indicates the normality of data distribution. Therefore, we can use parametric test for further data analysis. Table 1 indicates the result of Kolmogorov-Smirnov Test.

Table 1. One-Sample Kolmogorov-Smirnov test for vocabulary pretest in experimental and control group

		Pretestexperimental	Pretestcontrol
N		35	32
Normal Parameters(a,b)	Mean	12.17	13.00
	Std. Deviation	3.815	3.292
Most Extreme Differences	Absolute	.128	.131
	Positive	.091	.100
	Negative	-.128	-.131
Kolmogorov-Smirnov Z		.757	.743
Asymp. Sig. (2-tailed)		.616	.638

As it is evident from Table 1, the result of normality test shows that p values of two groups in pretest is .616 for the experimental group and .638 for the control group and they are more than significance level (0.05). Therefore, we can accept the assumption of normality and we can use a parametric test like ANOVA for comparing the results of pretest and posttest in experimental and control group. In order to answer the first question, first the gain scores from pretest to posttest in experimental and control group were computed and then ANOVA was used to see whether there was any significant difference between the two groups in pretest and posttest stage. The following tables show the results.

The results of data analysis (ANOVA) in table 3 below indicates that there is a statistically significant difference between the students' performance in experimental and control group in the results of pretest and posttest because obtained F value of 126.083, was found to be significant at .001 level (P=.000). Also, by looking at table 2 above, subjects scored higher in experimental group

($M=5.37$, $SD= 2.129$), after they were taught the two vocabulary strategies considered for the purpose of this study including context clues, and word parts and word families, than the control group ($M=.16$, $SD= 1.609$). With respect to this point, the first null hypothesis (*Teaching vocabulary strategies cannot help Iranian EFL learners in retention of vocabulary.*) is rejected. In other words, teaching vocabulary strategies play a significant role in developing the level of the learners' vocabulary knowledge.

Table 2. Mean gain scores of samples in experimental and control group

Group	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
Experimental	35	5.37	2.129	.360	2	12
Control	32	.16	1.609	.284	-3	3
Total	67	2.88	3.231	.395	-3	12

Table 3. Results of ANOVA for mean gain scores of samples in experimental and control group

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	454.655	1	454.655	126.083	.000
Within Groups	234.390	65	3.606		
Total	689.045	66			

Q2: *Is there any significant difference between left or right hemisphere dominants on the effect of teaching vocabulary leaning strategies?*

H02: *There is no significant difference between left or right hemisphere dominants on the effect of teaching vocabulary leaning strategies?*

In order to answer the second question, "Is there any significant difference between left or right hemisphere dominants on the effect of teaching vocabulary leaning strategies?" an independent sample test was used to see whether there is any significant difference between left and right dominant FFL learners after doing any vocabulary strategy treatment. Table 4 and 5 indicates the results.

Table 4. Mean sample gain score for left and right dominant group in posttest

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pretest	Left-dominant	15	15.07	3.011	.777
	Right-dominant	20	10.00	2.791	.624

As it is clear from table 4, there is a significant difference between left and right dominant EFL learners after vocabulary strategy training because the t value of 1.543, was found to be significant at .05 level ($P=.016$). Also, by looking at table 3 above, left-dominant subjects scored higher

($M=15.07$, $SD= 3.011$), after they were taught the two vocabulary strategies considered for the purpose of this study including context clues, and word parts and word families, than the students in right-dominant group ($M=10.00$, $SD= 2.791$). With respect to this point, the first null hypothesis (*There is no significant difference between left or right hemisphere dominants on the effect of teaching vocabulary leaning strategies?*) is rejected. In other words, left-dominant learners had better performance in learning vocabulary after they were taught vocabulary strategies, in comparison to right-dominant learners.

Table 5. Independent sample gain score for left and right dominant group in posttest

t-test for Equality of Means					95% Confidence Interval of the Difference	
t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	upper
1.543	33	.016	1.100	.713	-.351	2.551

As stated earlier, results of this study entail that explicit teaching of various vocabulary learning strategies to students is crucial and that teachers must expose them to varied L2 learning techniques and train them how to effectively use these by applying specific strategies where appropriate. On the other hand, those disciplines that use the most strategies must be provided with more challenging activities, enrichment exercises, and classroom situations that call for the optimal use of vocabulary learning techniques.

In addition, the results of current study yielded that both right brained learners and left brained learners' performance went under the influence of vocabulary strategy training, though left brained learners experimental group were affected more and they significantly outperformed right brained learners experimental group. These findings can be attributed to the different characteristics of the learners.

In a broad sense, left brained learners are better learners of vocabulary compared to their counterparts. In another sense, in English class, left hemisphere dominance learners have a good understanding of vocabulary learning (Fleming, 2003).

It can also be proposed that since left brained learners are more logical and analytical and process information in a sequence and more linear manner in comparison with right brained learners, teaching vocabulary strategies was more effective for them. In another words, left brained learners preferred to use information piece by piece in an order, move from part to whole and line the information up and then arrange them in a logical order so as to draw logical information. Thus, they benefited more from vocabulary. If the focus of study shifted to another area of language for instance grammar, pronunciation, the results might be different for right brained vs. left brained learners. This is the point that should be considered in future studies.

5. Conclusion

Many researchers reported that learner, who are left-dominant can promote higher-order thinking and problem-solving abilities in students (Brown, 2007; Palincsar&Herrenkol, 2002). This study was designed to investigate the effects of two instructional methods for developing vocabulary including word parts, and context clues on autonomous on left-dominant and right-dominant students' performance studying English in English language institutes at intermediate level.

The findings revealed that experimental group made progress over time, that is, the students from this group attained an increase in scores from pretest to posttest. Further, there was a significant difference between left-dominant and right-dominant learners in posttest in experimental group. The results of this study raise more questions and point out the need for the implementation of hemispheric dominance in relation to vocabulary achievement.

Right-brained students who were good at responding demonstrating instructions and visuals showed a good performance in the Vocabulary part. As being open to open ended questions they were also good at the writing part. Left brained students, who were good at problem solving by logic and who can see the differences, did well in the Use of English and Reading parts. Whole brained students' exam results seemed to be balanced because they could use both sides of their brains nearly equally.

All the results of this study indicate that the brain dominance effects the achievement of the students in the English classroom. Taking all these into consideration teachers can find the efficient strategies for their own classrooms. Therefore, teachers can also find out what kind of activities the students need to improve the part of their brain apart from the dominant one.

Being aware of own brain dominance helps the teacher not to teach only through his / her own dominance. By finding out the brain dominance of the students and giving activities according to them, the teacher might also improve the efficiency of his or her own teaching, increase the success rate and also advise the students on learning strategies and recalling.

All these information can serve teachers to make sure that they appeal to all learners with different brain dominances and provide their learners experiences with all three modalities. They should find a way to combine all three to make their learners enhance, to create the right atmosphere to make learning easier and more enjoyable and to help students to reinforce their knowledge with meaningful activities.

To conclude, it is not the teachers' responsibility to teach all vocabulary to the learners. Learners should depend on themselves by adopting strategies that suit their abilities in learning vocabulary. Vocabulary learning is not always easy. But with practice and time, learners should find that they are making progress. Learners should study items that appear in many contexts. Learning in rich contexts is valuable for vocabulary learning. Vocabulary words should be those that the learner will find useful in many contexts. When vocabulary items are derived from content learning materials, the learner will be better equipped to deal with specific reading matter in content areas. Learners will feel that vocabulary learning is effective when it entails active engagement in learning tasks.

As a conclusion, it can be said that investigating hemispheric dominance and learning styles from the aspects of curriculum, teaching process and teachers will contribute significantly to the Iranian Education.

6. Recommendations

While a small sample was used for the purpose of this study, the findings may have suggestions for vocabulary instructional methods for a larger sample of community group. For example, elaboration technique instruction, where teachers elaborate different words can be regarded as an effective instructional method based on this study. However, researchers such as Bukoweicki (2006) indicate that the use of the dictionary is not the only way to explicitly understand word meaning. This study raises questions about where other methods of vocabulary instruction might be appropriate, and under what different conditions.

In addition, the success of EFL learners using word parts and word family instruction suggests that instructors should incorporate this instructional method into their repertoire of teaching strategies as well as other instructional strategies. These students made significant gains immediately after treatment and specifically with word parts. Knowledge of prefixes, suffixes, and roots can be extremely helpful in one's native language, but it may be of significant value for Iranian EFL learners. Nagy and Anderson (1984) estimated that around 60% of the new words encountered by students are able to be broken down into parts that aid in determining the meaning of the word.

The result of this study may benefit most the language teachers, the English Department, the school administrators, the policy makers, and the producers/developers of language instructional materials.

For the English Teacher, the result of the study may direct them to look deeper into the parts of their English syllabi that need some improvement, enrichment or revision. It may also encourage them to improve their teaching styles to suit to the students' learning styles and diversify activities as well as methods of teaching to optimize learning success of students.

For the English Department, the result of the study may be used as basis in the department's preparation and production of suitably diversified language teaching and testing materials for classroom utilization by the English major as well as by the non-English major students.

For the school administrators, the result of the study may provide them insights as to the teaching needs of their language faculty as basis in designing and conducting appropriate in-service trainings that may help revitalize the teaching of English in the tertiary level in terms of content, materials and methodology.

As far as some recommendations for action are concerned, educational systems constantly look for teaching methods that meet the diverse learning styles and needs of today's students. Administrators and teachers alike go through various trainings each year to investigate and implement different strategies and styles to ensure that students reach optimal academic achievement. Many systems adopt programs and require teachers to follow these specific programs in their daily instruction. The results of this study revealed that the use of vocabulary strategy training had a positive effect on vocabulary achievement. Further, while all students showed gains in test scores from pretest to posttest, the left-dominant learner group achieved significantly better tests scores than did the right-dominant group without any kind of instruction. This study was able to report findings similar to those of other studies in which the use of vocabulary learning strategies promoted academic achievement (Adams, 2000; Stevens, 2003).

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