

The impact of using electronic dictionary on vocabulary learning and retention of Iranian EFL learners

Amirian, Seyyed Mohammad Reza ✉

English Department, Hakim Sabzevari University, Iran (sm.amirian@sttu.ac.ir)

Heshmatifar, Zahra

English Department, Hakim Sabzevari University, Iran (heshmatifar79@yahoo.com)



ISSN: 2243-7738
Online ISSN: 2243-7746

OPEN ACCESS

Received: 15 August 2012

Revised: 16 February 2013

Accepted: 10 March 2013

Available Online: 11 March 2013

DOI: 10.5861/ijrset.2013.384

Abstract

Dictionary use is one potential vocabulary learning strategy in developing learning process. With the development of digital technology, types of learners' dictionaries have been diversified during the last two decades. The present study aims at investigating the effects of electronic dictionary on learning and long-term retention of vocabulary of Iranian lower-intermediate EFL learners. To ensure the homogeneity of the participants, an Oxford Placement test was administered to 74 female students studying at a public high school in Sabzevar, Iran. 60 participants whose scores were two standard deviations above and below the mean were selected as homogeneous and were assigned to Electronic Dictionary (ED) and Paper Dictionary (PD) groups. During the five sessions of the treatment, 35 vocabularies were instructed to the two groups. The ED group received the words through a CD-ROM dictionary to find meaning and definition of newly taught words, while PD group followed the ordinary method using PD. Both groups took an immediate posttest administered immediately after the treatment and a delayed posttest administered two weeks later. The results of the t-test revealed that the students in ED group outperformed those in PD group. Hence, it is suggested that an ED can enhance learning and retention of vocabulary. This study also provides pedagogical implications for utilizing ED as an effective learning tool.

Keywords: electronic dictionary; paper dictionary; vocabulary learning; vocabulary long-term retention

The impact of using electronic dictionary on vocabulary learning and retention of Iranian EFL learners

1. Introduction

Vocabulary items are considered as ‘building blocks’ of language without which a message can hardly be conveyed. According to McCarthy (1990); “*without words to express a wider range of meanings, communication in an L2 just cannot happen in any meaningful way*” (p. 140). Fortunately, most L2 teachers and learners are well aware of the fact that learning an L2 involves the learning of large numbers of words (Hulstijn, 2001). As Moras (2001) claims students might have a receptive knowledge of a wide range of vocabularies, which means they can recognize the items and their meanings; nevertheless, their productive use of vocabulary is normally restricted, and this is one of the areas that needs greater attention. Therefore, the considerable concern is that how to accomplish this task and what strategies to use to promote effective vocabulary learning.

When foreign language learners encounter an unknown word, one of the possible strategies is consulting a dictionary. The dispute over the kind of dictionaries to use in the foreign language classroom, if at all, has always been an on-going controversial issue. Some researchers (Knight, 1994; Schmitt, 2000) encourage students to infer word meaning by using contextual cues and incidental learning of vocabulary through extensive reading or listening, not by studying their short definitions or translations found in the dictionaries. These researchers believe that the frequent consultation of dictionaries interferes with short-term memory and hinders comprehension processes (Knight, 1994). Despite these researchers’ views, there is evidence that consulting a dictionary is found to enhance vocabulary learning, and to maximize retention of words as well (Neubach & Cohen, 1988). Moreover, recent research shows that consulting a dictionary is not harmful for L2 acquisition; in the sense that, it facilitates not only vocabulary acquisition (Hulstijn, Hollander, & Greidanus, 1996), but also comprehension of texts (Luppescu & Day, 1993).

1.1 Purpose of the study

The main purpose of the present study is to investigate which dictionary, PD or ED, represents a better environment for vocabulary learning and retention of Iranian EFL learners.

1.2 Research questions

With regard to the purpose mentioned above, the following research questions will be answered in this research:

- Does ED learning have any effect on improving vocabulary learning of Iranian EFL learners?
- Does ED have any effect on vocabulary long-term retention of Iranian EFL learners?

2. The importance of electronic dictionaries: Some theoretical views

Vocabulary is basic to communication and often seen as the greatest source of problems by second language learners. Studies on vocabulary learning strategies consider dictionary use as one of the most important vocabulary learning strategies and uncover what roles dictionaries play in L2 vocabulary learning. “*When students travel, they don’t carry grammar books, they carry dictionaries*” (Krashen, as cited in Lewis, 1993, p.iii). The process of dictionary development has been going on for several eras from a traditional paper dictionary (PD) to the electronic dictionary (ED).

An electronic dictionary is “*an electronic aid that offers immediate access to reference information with a*

clear and direct return path to the target information" (Aust, Kelley, & Roby, 1993, p. 64). The use of ED has been started since the 19th century. Recently, development in technological tools has improved the development of electronic dictionary. Furthermore, with easy access to the Internet, the number of electronic dictionaries (ED) users has been rapidly expanding (Yagi, 2004). Consequently, more research starts to focus on the use of EDs and their effects on vocabulary acquisition. According to Nesi (1999), in addition to different modes of dictionaries as monolingual, bilingual and bilingualized dictionaries, there are various types of electronic dictionaries including pocket electronic dictionaries (PEDs) known also as hand-held electronic dictionaries, dictionaries on CD-ROM or floppy disk, and online dictionaries. Compared with traditional paper dictionaries, the electronic dictionaries can provide a greater range of lexical information. Other advantages are electronic dictionaries are easy to carry around and use, sound is available, they provide a variety of routes for searching, they can be linked to other applications, and the database contains extra information.

3. Empirical studies on dictionary use

Previous research which mostly focuses on the impact of EDs and PDs on second or foreign language learning has yielded insightful results. In an experiment, Koga (1995) compared the effectiveness of an online ED and a PD for L2 reading. Forty Japanese university students were required to read six texts in three conditions (no dictionary, PD, and ED) and to answer comprehension questions. Koga found that students read faster in the no-dictionary condition than in the ED condition, and faster in the ED condition than in the PD condition.

Iwamoto's (1998) study compared the efficiency of a handheld ED with a PD for accessing the first meaning in an entry and the contextual meaning. Ten university students were asked to locate the first meaning in an entry for a set of words, using an ED and a PD. Next, they were asked to locate the contextual meaning in an entry for another set of words, using an ED and a PD. Iwamoto found that the students accessed the first meaning more than three times faster with an ED than with a PD, and that they accessed the contextual meaning more than two times faster with an ED than with a PD. Individual differences were smaller in the ED condition than in the PD condition, indicating that an ED allows efficient access to information for all students.

In another study, Koyama and Takeuchi (2004) examined how the difference in the interface designs of an ED and a PD affected EFL students' searching behavior. Eighteen undergraduate students read two texts without a dictionary and took a vocabulary test with a PD or an ED. The vocabulary test asked students to write definitions for target words by using the dictionary for four words and to quote usage examples from the dictionary for the other four words. A week later, students took recall and recognition vocabulary tests. Koyama and Takeuchi found that there were no significant differences in search time and the quantity of retrieved information between PD and ED conditions due to the improvement of the ED's interface design. Although no differences were found between PD and ED conditions in the rate of recall, the mean score was significantly higher in the ED condition than in the PD condition in the rate of recognition. Finally, although they regarded it as convenient, the students did not necessarily believe in the effectiveness of an ED for learning EFL. Koyama and Takeuchi conclude that the elaborative work in the process of searching in the PD condition leads to higher retention.

Laufer and Hill (2000) examined L2 learners' look-up patterns and the relationship between their look-up patterns and retention of the looked up words, using a Computer Assisted Language Learning (CALL) program. Their subjects were 72 EFL university learners in Hong Kong and Israel. They were asked to read an academic text on the screen with access to different lexical information of highlighted words. The subjects' look-ups were electronically recorded. Laufer and Hill found that the use of multiple dictionary information was associated with better retention.

In another research project, Inami, Nishikata, Nakayama, and Shimizu (1997) compared a CD-ROM based dictionary and a PD in their effectiveness for learning a set of English words. Eighty Japanese undergraduate and

graduate students learned either the definition or spelling of each English word by consulting a CD-ROM based dictionary or a PD. Then, they took two types of vocabulary tests, the tests that required supplying either the definitions or spellings of the learned words. The scores on both tests were higher in the CD-ROM condition than in the PD condition when students were allowed to search freely each word within the limited time period.

Having a look at the syntheses of the research findings and ideas, one can conclude that there is still a sort of discrepancy involved. As a result, the comprehensive review of research comparing the learning of L2 vocabulary through PD or ED fails to show significant effects for one method over the other. Consequently, the necessity of further research in this area seems to be crucial.

4. Method

4.1 Participants

The participants of this study consisted of 60 female pre-university students, ranging in age from 17 to 19. All of them were native Persian speakers. The reason why pre-university students were selected was that they were preparing to pass the university entrance examination, so a vocabulary class was planned to help them in expanding their lexical knowledge. In order to make sure about the students' homogeneity, an Oxford Placement Test (OPT) was administered. Based on the OPT, they were considered as lower-intermediate level learners. Those participants (N=30) who reported that they were already familiar with a computer environment were voluntarily selected. This group made the electronic dictionary (ED) group and the other group (N=30) was assigned to the paper dictionary (PD) group.

4.2 Instruments

For the purpose of this study, an Oxford Placement Test (OPT, version 1) was administered to homogenize the participants based on their language proficiency level. The reliability index of this test was estimated through Kuder-Richarson formula 21 as 0.82. The reading passages used in this study were selected from the book entitled *New Bridging the Gap for Iranian National University Entrance English Exam* (INUEEE) compiled by Molayi (2008). INUEEE test utilized in this study is a well-established reliable and valid test designed by specialists in the field. The target words which were the focus of instruction were selected from the passages. Moreover, a CD-ROM dictionary called Longman Dictionary of Contemporary English (LDOCE, 5th Edition) was utilized by participants in the ED group, while the PD group used a paper dictionary.

4.3 Treatment and Procedure

One week before the study, a standardized English placement test (Oxford Placement Test) was administered to the total of 74 participants. Those participants who were located two standard deviations above and below the mean were selected to participate in this study. Having analyzed the data, 60 participants were chosen as the lower intermediate-level learners. Once the researcher made certain that the participants formed a homogenous sample, the pretest examining the knowledge of the target words was administered. The participants were presented with a list of forty words and were asked to write down the meaning of the words in L1. Five words which students could recognize their meanings were discarded. Consequently, thirty five unknown words were selected for the purpose of this study. When the final participants as well as the target words were identified, the participants were divided into two groups of 30. Those who were acquainted with computer were assigned to electronic dictionary (ED) group and others in paper dictionary (PD) group.

Having completed the Pretest stage, the participants in both PD group and ED group received the treatments in five sessions, so the 35 new words were divided into groups of seven target words highlighted in the printed texts. The reason for this division, as Grains (1986, cited in Moras, 2001, p. 1) puts it, is that "*retention in short term memory is not effective if the number of chunks of information exceeds seven. This suggests that in a given*

class we should not aim at teaching more than this number". The class for both groups consisted of two sessions a week, and the teacher's instructional approach and the material were the same for both groups. But ED group used a CD-ROM dictionary called Longman Dictionary of Contemporary English (LDOCE) to find meaning and definition of newly taught words, while PD group followed the ordinary method using paper dictionary for finding the meaning of new words.

Students in both groups were instructed to read the texts and look up information about the highlighted words in the dictionary. They were not notified of a vocabulary test that would follow. The fact that the words were underlined in the texts was that the task was specified as vocabulary learning, so the researcher made the words salient to the learners to look them up in the dictionary obligatorily. Every session, seven new words were taught by the teacher. She gave both groups their definition, pronunciation, and also some synonyms and antonyms. LDOCE was distributed to ED group to work with, on the computer site. It provided students with English definition of words. In addition, some synonyms, antonyms, collocations, origins, contextualized examples, cross-word puzzles, visual and pictorial presentation, and an audible pronunciation by a native speaker in both British and American accent was also available. Thus, students in ED group could listen and repeat the pronunciation of new words. However, the PD group was required to work with the paper dictionary. In this situation, they were provided just with written phonetic form of pronunciation and had no access to pictorial and aural presentation of the words.

Posttest was administered two times throughout the study. In the fifth session, the participants in both groups took an Immediate Posttest without being already informed about it. The test was a multiple choice test consisting of thirty items to be answered in 30 minutes under the supervision of a teacher. After two weeks and without further treatments, in the seventh session, the unexpected Delayed Posttest was administered. This test was used to assess students' long-term retention of vocabulary. Following a similar study by Harris (1969), a two week span is chosen because if the time interval is shorter, the students might use their short term memory to answer the questions. Furthermore, more than two weeks interval had the problem of further learning. The delayed recall test under experimental conditions is normally referred to as "long-term retention" test (Yongqi, 2003, p. 12). Another point which should be mentioned is that in both phases, the same test items were administered, but the order of target items was changed two weeks later in the unexpected delayed recall test.

5. Results

The present study aimed at comparing the effectiveness of ED vs. PD in enlarging the vocabulary knowledge of Iranian high school learners. Two groups of students were assigned to ED and PD groups and undergone treatments in using these two type of dictionaries. The data were analyzed using the T-test statistical analysis employing SPSS 17. For all the analyses, the alpha level was set at .05.

5.1 English Placement Test Results

Even though 74 students had been chosen from a population of pre-university students, they were further given a standardized English placement test to ensure their homogeneity. As stated earlier, 60 students scoring within the range of 30-39 were chosen as the final pool of participants in the study. The descriptive statistics of the pre-test appears in the Table 1.

Table 1

Descriptive Statistics of the Placement Test

<i>n</i>	Sum	Mean	<i>SD</i>	<i>Std. Error</i>	Max	Min	K-R 21
74	3094	34.38	2.890	0.305	42	27	0.82

As Table 1 indicates, mean score of homogenizing test is 34.38. To obtain the desired results, reliability of placement test was calculated by Kuder-Richardson formula 21. The result shows that the value for Kuder-Richardson formula 21 for this test is 0.82. Since this index is large enough and it is near to one, it can be acceptable. An independent t-test was conducted for electronic dictionary (ED) group and paper dictionary (PD) group before the implementation of treatment in order to compare the two groups' means obtained from the pretest. The results appear in Table 2 and Table 3.

Table 2*Descriptive Statistics for Pretest Results on Vocabulary Test for Both Groups*

Group	<i>n</i>	Mean	<i>SD</i>	<i>SE Mean</i>	Max	Min
ED	30	36.17	4.045	0.878	42	27
PD	30	33.83	4.872	0.905	42	24

As appears in Table 2, the mean scores of ED and PD groups are 36.17 and 33.83, respectively. To examine if this difference is significant, an independent samples t-test is run.

Table 3*Independent Samples T-test for Pretest*

Pretest Difference	Paired Difference			<i>t</i>	<i>df</i>	Sig.(2-tailed)
	Mean	<i>SD</i>	<i>SE</i>			
ED-PD	2.24	4.360	1.058	1.957	29	0.60

Table 3 shows that obtained t value for 29 degrees of freedom is 1.95 which is not significant at $p < 0.05$, ($t(29) = 1.95$, $p = 0.6$). It means that there is no significant difference between the groups at the beginning of treatment and they are homogenized.

5.2 Results of Immediate Posttest

In order to see whether the treatment given to the ED group had caused any significant change in this group and to see if the participants in this group had performed significantly different on the immediate posttest, another independent t-test was conducted. The results obtained from this statistical test are presented in Table 4.

Table 4*Descriptive Statistics for Immediate Posttest*

Group	<i>n</i>	Mean	Max	Min	<i>SD</i>	<i>SE Mean</i>
ED	30	26.84	28	22	2.530	1.045
PD	30	23.60	27	19	2.278	0.936

As table 4 indicates, the mean score of Immediate Posttest in ED group is 26.84 ($SD = 1.04$), while that of PD group is 23.60 ($SD = .93$). In order to examine the differences and see whether they were significant, an independent sample t-test was applied. The results are demonstrated in Table 5.

Table 5*Independent Samples T-test for Immediate Posttest*

Pretest Difference	Paired Difference			<i>t</i>	<i>df</i>	Sig.(2-tailed)
	Mean	<i>SD</i>	<i>SE</i>			
ED-PD	3.24	5.680	1.051	1.33	29	0.029

As indicated in Table 5, the mean difference between the ED and PD groups' scores measured at the time of Immediate posttest was significant ($t(29)= 1.33, p=.02, p<.05$). Therefore, it is concluded that there is a significant difference in vocabulary scores of the ED and PD groups on the Immediate Posttest and that the ED group performed better on the test.

5.3 Results of Delayed Posttest

At the next stage, to examine if there is a significant difference on Delayed Posttest means between ED group and PD group, the two groups were compared based on the scores of their Delayed posttest administered after a two-week span. Descriptive statistics of Delayed Posttest in ED group and PD group are presented in Table 6.

Table 6

Descriptive Statistics for Delayed Posttest

Group	<i>n</i>	Mean	Max	Min	<i>SD</i>	<i>SE Mean</i>
ED	30	25.28	27	20	2.351	0.71
PD	30	22.62	25	18	2.824	0.94

As displayed in Table 6, the mean scores of ED group and PD group are 25.28 ($SD= 2.31$) and 22.62 ($SD= 2.84$), respectively. In order to explore the significance of the mean differences of the ED and PD groups, another independent sample t-test was employed. The results of the t-test are shown in Table 7.

Table 7

Independent Samples t-test for Delayed Posttest

Pretest Difference	Paired Difference			<i>t</i>	<i>df</i>	Sig.(2-tailed)
	Mean	<i>SD</i>	<i>SE</i>			
ED-PD	2.66	5.794	1.467	1.33	29	0.037

Table 7 clearly indicates that the mean difference of the Delayed Posttest ($M= 2.66$) was significant with alpha set at 0.05 level of significance ($t(29) = 1.33, p=.03, p<.05$) indicating that the type of dictionary did have an influence on retention scores. Consequently, it is shown that the difference between the means of ED group and PD group on Delayed Posttest was significant. In other words, it could be claimed that the ED group significantly outperformed the PD group in retention vocabulary test.

6. Discussion

The major finding of the present study as measured by the Immediate and Delayed posttests is that achievement in ED group improved as a result of exposure to ED instruction. This means that the use of ED proved to be a powerful tool for improving students' achievement in vocabulary learning and retention. This finding is consistent with the findings of prior studies using this form of technology in vocabulary learning such as Iwamoto (1998), and Koga (1995) who found that students accessed the contextual meaning more than two times faster with an ED than with a PD. Furthermore, the results are similar to those of Bogaards (2001) and Hulstijn (1993) who showed that some L2 learners decide not to use the paper dictionary (PD) when meeting unfamiliar words in a text. One of the reasons often reported by students is the time involved in flicking through the dictionary pages and the subsequent disruption of the flow of reading. An electronic dictionary may provide a good solution to this problem since the ease and speed of using may encourage the learner to look up unfamiliar words.

Additionally, in the two research conditions, the new words were underlined in the texts, thus drawing learners' attention to them. It was found that words looked up in ED were retained better than words looked up

in PD. One reason may have to do with the visual impact produced by a word on the computer screen. A paper dictionary may not have the same prominence, and may therefore fail to create a memory trace to the word. Another explanation relates to the effect of look up patterns on learning. It is sometimes claimed that multiplicity of information (translation, definition, examples, pictures, games) may provide several retrieval routes to the words and would therefore benefit retention (Chun & Plass, 1996). This is congruent with the Dual-coding Theory (Paivio, 1971), which states that information coded both verbally and visually is more effective for learning than information coded in either form. The present study seems to confirm these findings. Therefore, the results suggested that a combination of aural and pictorial definitions of words was more beneficial to the learners, possibly due to with the fact that they received two modes of input, namely verbal and visual.

A counter argument on electronic dictionaries claims that the ease of use will result in shallow processing of the looked up word and will therefore be detrimental to retention (Kent, 2001; Schmitt & McCarthy, 1997). The results of this study, however, are inconsistent with these researchers' studies and do not support this position. Perhaps this is due to the variety of look-up options resulted in careful attention to the lexical information provided by the ED such as pictures, games, audible pronunciation, and some special examples related to the words. Overall, the use of technology inside or outside the classroom tends to make the class more interesting. However, one quantifiable benefit to use technology outside the classroom is that students can spend more time on tasks. More time is frequently cited as a factor in achievement (Warschauer, 1996).

7. Conclusion

This study investigated the effectiveness of ED on vocabulary learning and retention of Iranian EFL learners. Consistent with the results of the previous research carried out in the field (Al-Seghayer, 2001; Laufer & Hill, 2000; Osaki, Ochiai, Iso, & Aizawa, 2003), the results indicated that ED is more useful than PD in learning and retention of vocabulary. Some different patterns of use between ED and PD were identified, which seem to result from design features of two types of dictionaries. ED and PD are perceived as with different advantages and disadvantages. It was also found that there are significant differences between ED and PD use in learning and retention of vocabulary, for example the speed of the former is significantly faster than the latter. Moreover, fun feature was found to be another main motivator for using an electronic dictionary. As a result, it proved to be a better learning tool, since it enhances both vocabulary learning and recall. Possibly, the visual impact it creates and the prominent position of a headword on the computer screen attract more users' attention than a printed page.

The present study also supports the claim that "electronic dictionaries and software that provide textual, contextual, and/or multimedia annotations" are part of "main technologies" which support vocabulary teaching (Chun & Payne, 2004, p.1), and that multimodality strongly enhances vocabulary learning. With regard to the implications for the classroom, one that can be drawn from this study is that teachers need to adapt themselves to the technological changes in today's world and develop their multiple literacies for new teaching approaches. They can assign the task of looking up specific words through electronic dictionaries in the classroom as well. Further studies could examine the vocabulary long-term retention of the participants with different learning styles.

8. References:

- Al-Seghayer, K. (2001). The effect of multimedia annotation modes on L2 vocabulary acquisition: A comparative study. *Language Learning & Technology*, 5(1), 202-232. Retrieved January 31, 2012, from <http://llt.msu.edu/vol5num1/alseghayer/default.html>
- Aust, R., Kelley, M. J., & Roby, W. (1993). The use of hyper-reference and conventional dictionaries. *Educational Technology Research and Development*, 41(4), 63-73. <http://dx.doi.org/10.1007/BF02297512>
- Bogaards, P. (2001). Lexical units and the learning of foreign language vocabulary. *Studies in Second Language*

- Acquisition*, 23, 321–343. <http://dx.doi.org/10.1017/S0272263101003011>
- Chun, D. M., & Payne, J. S. (2004). What makes students click: working memory and look-up Behavior. *System*, 32, 481-503. <http://dx.doi.org/10.1016/j.system.2004.09.008>
- Chun, D. M., & Plass, J. L. (1996). Effects of multimedia annotations on vocabulary acquisition. *The Modern Language Journal*, 80, 183–212. <http://dx.doi.org/10.1111/j.1540-4781.1996.tb01159.x>
- Harris, D. P. (1969). *Testing English as a second language*. New York, McGraw-Hill Book Company.
- Hulstijn, J. H. (1993). When do foreign-language readers look up the meaning of unfamiliar words? The influence of task and learner variables. *Modern Language Journal*, 77, 139-147. <http://dx.doi.org/10.1111/j.1540-4781.1993.tb01957.x>
- Hulstijn, J. H. (2001). Intentional and incidental second language vocabulary learning: A reappraisal of elaboration, rehearsal, and automaticity. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 258-286). Cambridge: Cambridge University Press. <http://dx.doi.org/10.1017/CBO9781139524780.011>
- Hulstijn, J. H., Hollander, M., & Greidanus, T. (1996). Incidental vocabulary learning by advanced foreign language students: The influence of marginal glosses, dictionary use, and reoccurrence of unknown words. *The Modern Language Journal*, 80(3), 327-339. <http://dx.doi.org/10.1111/j.1540-4781.1996.tb01614.x>
- Inami, K., Nishikata, A., Nakayama, M., & Shimuzu, Y. (1997). Effectiveness of learning English words using a CD-ROM dictionary. *Japan Journal of Educational Technology*, 21(2), 107-117.
- Iwamoto, Y. (1998). Effectiveness of reduction of search time in using electronic dictionary [In Japanese]. *Bulletin of Chugoku*, 21(2), 202-208.
- Kent, D. (2001). Korean university freshmen's dictionary use and perceptions regarding dictionaries. *The Korean TESOL Journal*, 4(1), 70-86.
- Knight, S. (1994). Dictionary use while reading: The effects on comprehension and vocabulary acquisition for students of different verbal abilities. *The Modern Language Journal*, 78(3), 285-299. <http://dx.doi.org/10.1111/j.1540-4781.1994.tb02043.x>
- Koga, Y. (1995). The effectiveness of using an electronic dictionary in second language reading. *Bulletin of the Liberal Arts of Hiroshima University*, 44, 239- 244.
- Koyama, T., & Takeuchi, O. (2004). Comparing electronic and printed dictionaries: How difference affected EFL learning. *JACET Bulletin*, 38, 33-46.
- Laufer, B., & Hill, M. (2000). What lexical information do L2 learners select in a CALL dictionary and how does it affect word retention? *Language Learning & Technology*, 3(2), 58-76. Retrieved February 29, 2012, from <http://lt.msu.edu/vol3num2/laufer-hill/index>
- Lewis, M. (1993). *The lexical approach: The state of ELT and the way forward*. Hove, England: Language Teaching Publications.
- Longman Dictionary of Contemporary English*. (5th ed.). (2003). Essex, England: Pearson Education Limited.
- Lupescu, S., & Day, R. (1993). Reading, dictionaries, and vocabulary learning. *Language Learning* 43(2), 263-287. <http://dx.doi.org/10.1111/j.1467-1770.1992.tb00717.x>
- McCarthy, M. J. (1990). *Vocabulary*. Oxford: Oxford University Press.
- Molayi, M. (2008). *New bridging the gap*. Qom: Parhizkar Publication.
- Moras, S. (2001). *Teaching vocabulary to advanced students: A lexical approach. Karen's linguistic issues*. Retrieved January 17, 2012, from http://ucrel.lancs.ac.uk/publications/cl2007/paper/170_paper.html
- Nesi, H. (1999). A user's guide to electronic dictionaries for language learners. *International journal of lexicography*, 12(1), 55– 66. <http://dx.doi.org/10.1093/ijl/12.1.55>
- Neubach, A., & Cohen, A. D. (1988). Processing strategies and problems encountered in the use of dictionaries. *Dictionaries: Journal of the Dictionary Society of North America*, 10, 1-19. <http://dx.doi.org/10.1353/dic.1988.0018>
- Osaki, S., Ochiai, N., Iso, T., & Aizawa, K. (2003). Electronic dictionary vs. paper dictionary: Accessing the appropriate meaning, reading comprehension and retention. *Proceedings of the 3rd ASIALEX Biennial International Conference* (pp. 205-212).
-

- Paivio, A. (1971). *Imagery and verbal processes*. New York: Holt, Rinehart, & Winston.
- Schmitt, N. (2000). *Vocabulary in language teaching*. Cambridge: Cambridge University Press.
- Schmitt, N., & McCarthy, M. (1997). *Vocabulary: Description, acquisition and pedagogy*. Cambridge: Cambridge University Press.
- Warschauer, M. (1996). Motivational aspects of using computer for writing and communication. *Computer Assisted Language Learning: An International Journal*, 27, 130-137.
- Yagi, S. (2004). A shift in the development and the latest information concerning electronic dictionaries [In Japanese]. Paper presented at the JACET Kansai Chapter Conference, Kobe, Japan.
- Yongqi Gu, P. (2003). Vocabulary learning in a second language: person, task, context and strategies. *TESL-EJ*, 7(2), 1-28.