The effect of three vocabulary techniques on the Iranian ESP learners' vocabulary production[*]

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Abstract
The present study aimed to examine the effect of three vocabulary techniques (dictionary use, etymological analysis, and glossing) on the Iranian ESP learners' vocabulary production. Forty-five university students majoring in architecture at Azad University, Anzali branch, participated in this study. They were divided into three groups, and each group was randomly assigned to one kind of treatment condition (dictionary use group, etymology group, and glossing group). The Michigan proficiency test was used to ensure the homogeneity of the ESP learners. The three experimental groups received instruction for three weeks. ESP learners took a vocabulary production test (VPT). A one-way between groups ANOVA was conducted to analyse the data. The results showed that dictionary use improved ESP learners' vocabulary production, and dictioary use group outperformed the other two groups. The study concludes that dictionary use faciliates vocabulary production.

Keywords: Dictionary use; Etymological analysis; Glossing; Vocabulary production

Introduction

Most foreign language learners are aware that the achievement of vocabulary is a central, and an important, component in the course of their learning process. A great command of word knowledge is essential for EFL/ESL learners, particularly for advanced learners of English for specific purposes (ESP). Nation (2001) describes how learners should learn a specific word by stating it is wise to direct vocabulary learning to more specialised areas when learners have mastered the 2000-3000 words of general usefulness in English. Therefore, learners need to learn different kinds of vocabulary, procedures for learning them, and particular strategies that help them gain new vocabulary.

Regarding this view, ESP teachers should not be concerned with teaching technical vocabulary. The duty of ESP teachers should be checking the understanding of ESP learners in specific contexts via doing tasks. Therefore, learners need to do tasks using specific content for getting great knowledge. Thus, vocabulary learning is important for learning L2 words that set up a challenge and assign tasks for both teachers and learners (Xu, 2010). Subject-specific vocabulary is related to specialised issues (Carter, 1988, p. 172).

Hornby (1995) defines vocabulary as "the total number of words in a language; vocabulary is a list of words with their meanings"(p.133). Therefore, vocabulary information is an important component for reading and writing skills (Pulido & Hambrick, 2008). The study on vocabulary learning and understanding word knowledge has been supported in second language acquisition (SLA) recently (Haastrup & Henriksen 2001; Meara, 2002).

In fact, effective techniques are related to the favorable outcomes of vocabulary learning, and learners need some techniques for word learning. Finally, they should choose some of them (Celce Murcia, 2014). Techniques of vocabulary learning are useful instruments for independent vocabulary learning. In this study, three main vocabulary techniques (dictionary use, glossing, and etymolodical analysis) are examined to meaure their effects on vocabulary production.

Review of the related literature

In order to shed light on the related issues in the area of vocabulary, the relevant literature that addresses the explanation of the theoretical and

empirical background, vocabulary learning, vocabulary production, and vocabulary in ESP classes is examined. Next, the three techniques of vocabulary learning include glossing, dictionary use, and etymological analysis are explained. Finally, the previous studies are reviewed in the following paragraphs.

According to Hutchinson and Waters (1987), most foreign language learners are aware that the achievement of vocabulary is an important component in the course of their learning process. A great command of word knowledge is essential for English as foreign language (EFL)/English as second language (ESL) learners, particularly for ESP learners. A review by Nation (2001) describes how learners should deal with a specific vocabulary item.

According to Dudly-Evans and St John (1998), ESP should be "designed to meet the specific needs of the learner" (p.4). Robinson (1991) pointed out that ESP is a purposeful process; it includes "special language and content" (p.4). According to Nation (2001), English vocabulary can be classified into high-frequency words, academic words, technical words, and low-frequency words. As ESP words are of low frequency, learning these words is very difficult for ESP learners. The teaching of the vocabulary in ESP is similar to the general principles of EGP, but teaching ESP vocabulary may be somewhat different (Dudly-Evans & St John, 1998).

Esfandiari (2015) argued that understanding the structural form of ESP vocabulary and deducing the meaning of a word in the texts are the most important characteristics of the vocabulary learning strategy. Thus, the teaching of the vocabulary in ESP is very important for production purposes, storage, and improvement. Nattinger (1988) suggests that different techniques for memorizing words include mnemonic devices, with the help of which a person can remember things, loci (methods of memorising information by placing each item to be remembered along an imaginary journey), and the use of word association, helping recall new vocabulary.

Nattinger highlights that cognitive processing can be facilitated through three ways in vocabulary learning: situational, semantic, and metaphor sets. Recalling a lexical item from memory can be connected to its meaning through the situational sets, such as book, shelf, library,

and so on, which can be remembered together. Semantic sets such as synonyms (e.g., dear, expensive) and antonyms (high quality, low quality) superordinate and subordinate words (vehicle, car), and metaphor sets (out of control, galloping riderless horse) are also ways of recalling words from memory.

The most common techniques used to teach ESP vocabulary include the use of cognates, L1 equivalents, linguistic analysis, and glossing (Dudley-Evans & St John, 1998). Using cognates is a very helpful method to teach an ESP word. Cognates refer to words that are similar in form and meaning to two different languages, for example, photosynthesis in biology, and base and acid in chemistry. ESP teachers may sometimes use L1 equivalents to teach ESP vocabulary. They help ESP learners to learn the meaning of the word more effectively (Khany & Saeedi, 2017).

Learners should pay attention to every word because vocabulary learning is an essential component of communicating, reading a text, thinking, and learning a second language (Luckner & Cook, 2010). There is no strong set limit about how much vocabulary should be recognised by L2 learners in order to be efficient and effective second language users. Their vocabulary information in both receptive and productive vocabulary levels should be so strong that learners with fruitful vocabulary awareness in production can simply present their ideas. Thus, they will have a better communicative competence (Hatch & Brown, 1995).

 Word knowledge can be divided into productive and receptive levels (Nation & Meara, 2002). Receptive vocabulary concentrates on the words that a person can remember easily as he/she is listening to or reading that special word (Schmitt, 2000). Productive vocabulary focuses on the words that a person selects to use while speaking and writing (Nation, 2001). Therefore, receptive knowledge means that learners receive information and understand it while productive knowledge means that learners are able to create information (Nation, 2003).

In regard to the importance of the vocabulary level, some researchers divide vocabulary into two parts: active and passive words. Harmer (1991) explains the difference between the two parts of

vocabulary. Using receptive vocabulary, learners read the text, see new words, recognise and understand them, but cannot produce these new words when speaking or writing (webb, 2009). Regarding productive vocabulary, learners read the text, understand new words, and even pronounce new words correctly. Overall, they can use them while speaking or writing. Therefore, knowledge of vocabulary has to do with both receptive and productive knowledge. Furthermore, the information about vocabularies is an elaboration on the meaning of the words. Basically, a word is made up of a sound or a group of sounds that can express the meaning of the word (Akbari, 2017). Therefore, the knowledge of a word includes written form, spoken form, frequency, connection form, and collocation (Schmitt, 2005, p. 5).

Using a dictionary is a good way of getting knowledge. Language teachers sometimes believe that using a dictionary when reading can result in effective learning (Bensoussan et al., 1984; Knight, 1994). Saving time, high motivation, quick searching, and improving learning are advantages of these types of dictionaries (Hulstijin, 1993; Oxford, 2001). However, looking up the words in an electronic dictionary can reduce the adhering of words in the mind.

Holly and King (1971) point out that glosses are very useful instruments for facilitating word learning while reading a text. Hulstjin (1992) claims that using glosses can help to avoid understanding any wrong meaning of new words in texts. Glosses have helped learners to understand the meaning of new words in texts (Bowles, 2004; Davies, 1989; Jacobs, Dufon, & Hung, 1994; Lumicka, 1998). Glossing is one of the effective factors on vocabulary retention and production (Nation, 2007).

Mountain (2015) claims etymology has a long history in English, and it plays an essential role in language development. A considerable amount of research has been done in the past 20 years on the representation and access of morphologically complex words. The purpose of this research was to see whether morphologically complex words are accessible in full forms. To address this issue, it is necessary to study suffixed and prefixed words. These are made up of two parts of morphemes that differ in the sequential range of stem and affix. Therefore, in suffixed words, the stem is prior to the affix. In prefixed

words, the affix is prior to the stem. Therefore, analysis technique through the study of suffix and prefix is one of the effective factors in vocabulary production (Cecile Beauvilain, 1996). Nation (2001) claims that the meaning of words can be changed by adding some prefixes (in, un, re, dis, and so on) or suffixes (er, or, tion, sion, and so on). These affixes can be divided into two parts: derivational and inflectional affixes (p. 164).

There are some studies which have examined the effect of dictionary use, glossing, etymological analysis in vocabulary learning, but so far very little attention has been paid to the role of glossing, dictionary use, and etymological analysis in vocabulary production among Iranian ESP learners. The purpose of the present research to was examine how ESP learners produce technical vocabulary. Following this line of investigation, the following research question is formulated:

RQ: Do dictionary use, glossing, and etymological analysis have any significant effect on vocabulary production?

Method

Participants

A sample of 60 Iranian male and female intermediate ESP learners studying architecture at Islamic Azad University, Anzali branch participated in this study. Prior to starting the study, they took a Michigan test, a language proficiency test for homogeneity purposes, including 20 vocabulary items, 20 grammar items, and ten reading items. Fifteen ESP learners were excluded from the study. The remaining 45 ESP learners were divided into three groups, and each group was randomly assigned to one kind of vocabulary treatment as follows: Dictionary use group, glossing goup, and etymological group.

Instruments and materials

We utilised the following instruments to collect the data for the present study:

1. The Michigan proficiency test

2. The Knowledge test

3. Vocabulary production test (VPT)

The Michigan proficiency test

In this study, the Michigan test was administered in order to homogenise the participants. The Michigan test is one of the most famous and standard tests for determining learners' level of English language proficiency. The test consists of three parts: Part A, 20 multiple-choice vocabulary items; part B, 20 multiple-choice grammar items; and part C, two passages with 10 multiple-choice reading items.

The knowledge test

Prior to administering treatment to all groups, a knowledge test was presented to learners to select the words for treatment. This test consisted of 60 words in the architecture field. The language learners were asked to choose the words they did not know the meaning of. The purpose was to choose only those words for treatment that the leaners were not familiar with.

Vocabulary production test (VPT)

To test the participants' knowledge of vocabulary production after treatment, the researchers used a researcher-made VPT test. VPT consisted of two parts: 15 fill-in-the blank items, and five synonym items. For the first part of the test, language learners had to fill in the blank, using the words they had used during treatment sessions. For the second part, they had to provide a Persian equivalent. Cronbach's alpha for VPT turned out to be 0.837 for the presnet study.

Data collection and analysis procedures

In order to achieve the objectives of this study, the following procedures were followed. Initially, a total of 60 ESP learners were selected and asked to take the Michigan proficiency test. Based on the Michigan test scores, language learners who were scored one standard deviation above or below the mean were excluded from the study. As a result, 15 participants were excluded, and the remaining 45 homogenous participants took part in this study. Participants were divided into three groups. Each group was randomly assigned to one of the treatment conditions in each class, and the participants in each treatment group followed one technique of vocabulary learning as follows:

Group A: dictionary use
Group B: glossing
Group C: etymological analysis

Prior to performing the treatment in all groups, a knowledge test was administered to select the words for treatment. This test consisted of 60 words specific to architecture field. The language learners were asked to choose the words they did not know the meaning of . Group A employed the dictionary use technique for vocabulary production. Group B used glossing. Group C used etymological analysis. The experimental period lasted for six weeks: One week for Michigan proficiency test, one week for the knowledge test, three weeks for doing tasks, and one week for vocabulary production test (VPT).

After collecting data, IBM SPSS STATISTICS (version 21) was employed to analyse the data. A One-way ANOVA procedure was used to answer the research question in this study. Also, analysis of variance was used to check the homogeneity of the three groups regarding their general proficiency. Descriptive statistics were also used to report the mean and the standard deviation.

The Results of the Data Analysis

To answer the research question (*Do glossing, dictionary use, and etymological analysis have any significant effect on vocabulary production?*), a one-way between groups ANOVA was carried out in order to explore the effect of dictionary use, glossing, and etymological analysis on ESP learners' vocabulary prduction.

Table 1

The Mean Scores of Three Techniques of Vocabulary Production Test

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound	Minimum	Maximum
Glossing	15	11.6667	4.20317	1.08525	9.3390	13.9943	7.00	18.00
Dictionary use	15	18.3333	1.63299	.42164	17.4290	19.2377	16.00	20.00
Etymological analysis	15	7.9333	3.01109	.77746	6.2658	9.6008	4.00	13.00
Total	45	12.6444	5.31788	.79274	11.0468	14.2421	4.00	20.00

As Table 1 displays, the mean scores for three techniques of glossing, dictionary use, and etymological analysis for VPT were 11.66, 18.33, and 7.93, respectively. The highest mean score was affiliated to the dictionary use and the lowest one belonged to the etymological

analysis technique on VPT. It was assumed that each group was an independent random sample from a normal population. To test this assumption, Levene's homogeneity of variance test was run for the results of VPT.

Table 2

Test of Homogeneity of Variances of Three Techniques of Vocabulary Production

Levene Statistic	df1	df2	Sig.
7.331	2	42	.45

As Table 2 illustrates, the Levene F of 7.33 has the probability of .45. Since the probability of the associated Levene F is bigger than significance level of .05 ($p = .45 > .05$), it can be concluded that they were homogenous before treatment was given.

Table 3

One-way ANOVA for Three Techniques of Vocabulary Production

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	832.711	2	416.356	42.485	.001
Within Groups	411.600	42	9.800		
Total	1244.311	44			

As Table 3 shows, the *F*-observed value for the effect of glossing, dictionary use, and etymological analysis techniques on students VPT equaled 42.48 ($F_{(2, 42)} = 42.485$, $p = .001 < .05$). The *p*-value is below the *p*-critical vale of 0.05. Therefore, it can be deduced that there is a statistically significant effect of three mentioned techniques on VPT.

The following formula was used to estimate effect size: Eta squared = sum of squares between groups/total sum of squares (Palant, 2013). The effect size for the F-value of 42.48 was .66. Based on the criteria developed by Cohen (1988), an effect size of .6 and above is considered large. Thus the results of this study were meaningful.

Table 4

Post-Hoc Scheffe's Tests for Three Techniques of Vocabulary Production

(I) Techniques (I-J)	(J) Techniques	Mean	Std. Error	Sig.	95% Confidence Interval Difference	
					Lower Bound	Upper Bound
Dictionary use	Glossing	6.66667*	1.14310	.000	3.7658	9.5675
Etymological analysis		10.40000*	1.14310	.000	7.4992	13.3008
Etymological analysis	Glossing	-3.73333*	1.14310	.009	-6.6342	-.8326
	Dictionary use	-10.40000*	1.14310	.000	-13.3008	-7.4992

*. The mean difference is significant at the 0.05 level.

As Table 4 displays, although the F-value of 8.42 denoted significant differences between the three techniques' mean scores on VPT, the post-hoc Scheffe's tests should be performed in order to locate the exact differences between the three mean scores.

A: There is a significant difference between the mean scores of the dictionary use and glossing techniques.

B: There is a significant difference between the mean scores of the dictionary use and etymological analysis test.

C: There is a significant difference between the mean scores of the glossing and etymological analysis techniques.

The difference among three techniques of glossing, dictionary use, and etymological analysis on VPT was best illustrated by a mean plot. Thus, Figure 1, is given below.
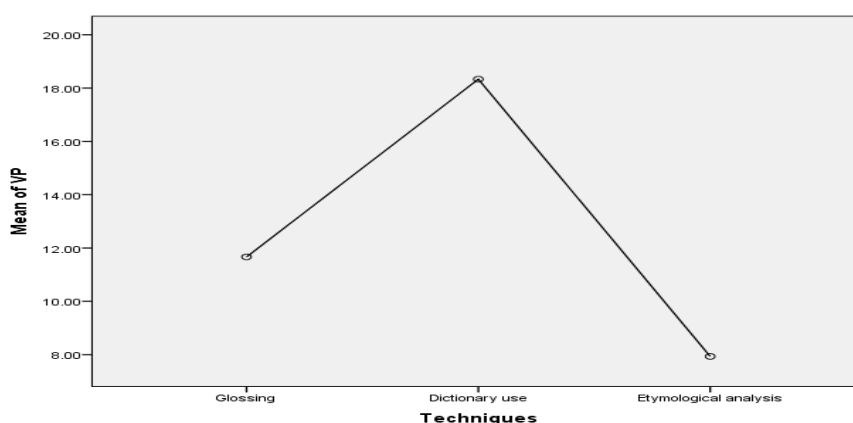
Figure 1. The mean plot of the difference among glossing, dictionary use, and etymological analysis techniques on VPT.

Discussion

The results of this study revealed that dictionary use technique group outperformed the other two groups. Glossing technique obtained the second position and etymological analysis technique gained the lowest position among three groups. These findings are in line with Chiu and Liu (2013), who examined the role of printed, pocket, and online dictionaries in increasing the knowledge of the learners for vocabulary learning. The results demonstrated that the students who utilised electronic dictionary had the maximum improvement of vocabulary learning.

In the same vein, Huang and Lin (2014) also examined the effect of combining glossing with inferring or meaning retrieval on vocabulary learning. The main results displayed that the gloss-retrieval-gloss condition was the most effective at improving vocabulary learning. They included that gloss-retrieval-gloss facilitates learning new words from texts.

Similarly, Zarei and Hasani (2011) investigated the effects of glossing conventions on vocabulary recognition and production. They found that glosses can aid the lack of word knowledge of the learners, who relied on their instructors or dictionary, and also, this view was supported by vela (2015) in using gloss for vocabulary acquisition. It was found that glossing is beneficial for both low proficiency and high proficiency learners.

In another study, Yanguas (2009) investigated multimedia glosses and their effects on comprehension and vocabulary learning. This finding was in accord with Zarei and Hasani (2011) concerning the positive effect of glossing technique on the students' vocabulary learning. By the same token, Mountain (2015) examined roots and affixes, as well as vocabularies. She found that instructors should be able to show the learners the analysis of words.

Akbarian (2010) investigated the relationship between vocabulary size and depth for Iranian ESP and EAP learners. The findings suggested that vocabulary size and depth might be considered by the same factors, especially as the learners' proficiency increases. The same results were found by Xaferi (2010), who found that instructors should encourage learners to learn many words in order to develop communicative competence.

Overall, dictionary use is one of the most common ways of vocabulary production. Vocabulary learning is important and also dictionary use is one of the best techniques to produce new words in ESP classes. However, some researchers maintain that using a dictionary while reading a text leads to insufficient learning (Bensoussan et al, 1984). Moreover, some other researchers concluded that some learners may use the wrong dictionary entry while reading a text, so this leads to misunderstanding (Luppescu & Day, 1993). Some other studies, on the other hand, have highlighted the usefulness of dictionaries.

This study revealed that dictionary use, glossing, and etymological analysis were three effective techniques for improving learners' vocabulary production in ESP classes. As a follow-up to these activities, or as a separate one, the instructor could provide learners with many ESP vocabularies which could be learnt through these techniques and use them in order to encourage the students to participate actively in class.

Conclusion and implications

The main purpose of this study was to examine the effect of three kinds of vocabulary production (dictionary use, glossing, and etymological analysis) on Iranian ESP learners' vocabulary production. The results indicated that dictionary use technique gained the best position in

comparison to the other groups. This finding further strengthened importance of dictionary use technique in language learning, particularly in vocabulary production. On the other hand, the lowest position among these groups belonged to the etymological technique. This may imply that ESP learners do not favor linguistic analysis to produce ESP words.

The present findings may help instructors to make the atmosphere of the class friendlier by highlighting the ease of vocabulary production in ESP classes. In addition, the results of this study could be a useful aid for solving problems due to affective factors that ESP learners may encounter in different contexts. For instance, due to lack of knowledge, they have low motivation in class. Consequently, they cannot produce vocabulary; therefore, they should work on their weaknesses by the help of their instructor when doing tasks. This study can be beneficial in upgrading the vocabulary knowledge of ESP learners, and it can also be usefully employed instead of traditional technique (translation) in ESP classes.

In this study, we highlighted three kinds of vocabulary learning techniques; it should be noted that this study can also be replicated with larger numbers of techniques such as ranking, vocabulary notebooks, etc. Furthermore, ESP learners' attitudes toward different kinds of technique should be examined to enlighten their efficacy of those strategies from ESP learners' viewpoints.

References

Akbari, Z. (2017). Developing a taxonomy of vocabulary learning strategies for an ESP context. *Journal of Applied Linguistics and Language research*, *4*(1), 90-108.

Akbarian, I. (2008). *The role of vocabulary knowledge in predicting performance on reading comprehension Item Types*. (Doctoral dissertation). University of Tehran: Tehran

Bensoussan, et al. (1984). The effect of dictionary usage on EFL test performance compared with student and teacher attitudes and expectations. *Journal of Reading in a Foreign Language, 2*(1), 262-76.

Bowels, M.A. (2004). L2 glossing: To call or not to Call. *Hispania, 87* (3), 541-552.

Carter, R. (1998). *Vocabulary: Applied Linguistics perspectives*. London: Routledge.

Celce-Murcia, M. (2014). An overview of language teaching approaches. In M. Celce-Murcia, D. Brinton, & M.A. Snow (Eds.), *Teaching English as a Second or Foreign Language,* 4th Edition, (pp. 2-14). Boston, MA: National Geographic Learning/ Heinle Cengage Learning.

Chiu, L. L., & Liu, G. Z. (2013). Effects of printed, pocket electronic, and vocabulary retention. *The Asia-Pacific Education Researcher, 22*(4), 619-634. doi: 10.1007/s40299-013-0065-1

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* Hillsdale, NJ: Erlbaum.

Davies, J. N. (1989). Facilitating marginal effects of glosses on foreign language reading. *The Modern Language Journal, 73*(1), 41-48.

Dudly-Evans, T., & St John, M. (1998). *Developments in ESP*: *A multi-disciplinary approach.* Cambridge   University Press.

Esfandiari, R. (2015). An investigation into ESAP needs of Iranian BA students of law. *The Journal of Teaching Language Skills (JTLS), 7*(3), 29-59.

Haastrup, K., & Henriksen, B. (2000). Vocabulary acquisition: acquiring depth of knowledge through network building. *International Journal of Applied Linguistics, 10*(2), 221-240.

Harmer, J. (1991). *The Practice of English Language Teaching.* London and New York: Longman.

Hatch, E., Brown, C. (1995). *Vocabulary, semantics, and language education.* Cambridge: Cambridge University Press.

Holly, F, M., & King, J, K. (1971). Vocabulary glosses in foreign language reading materials. *Language Learning, 21*(2), 213-219.

Hornby, A. S., (1995). *Oxford advanced learners' dictionary of current English.* Oxford: Oxford University Press.

Huang, L., & Lin, CH. (2014). *Three approaches to glossing and their effects on vocabulary learning. System 44*(3), 127-136.

Hutchinson, T., & Waters, A. (1987). *english for specific purposes.* Cambridge: Cambridge University Press.

Hulstjin, J. H., (1992). Retention of inferred and given word meanings: Experiments in incidental vocabulary learning. In P.J.L. Arnaud & h. Bejoint (Eds.), *Vocabulary and Applied Linguistics* (pp. 113-125). London: MacMillan.

Hulstjin, J. H., (1993). When do foreign language readers look up the meaning of unfamiliar words? The influence of task and learner variables. *The Modern Language Journal 77*, (2), 139-147.

Jacobs, G. M., Dufon, P., & Hong, F.C. (1994). L1 and L2 vocabulary glosses in L2 reading passages. Their effectiveness for increasing comprehension and vocabulary knowledge. *Journal of Research in Reading, 17*(1), 19-28.

Khany, R., & Saeedi, M. (2017). Material development and English for academic purposes word list; a reductionist approach. *Journal of English Language Teaching and Learning, 19,* 52-72.

Knight, S. (1994). Dictionary: The tool of last resort in foreign language reading? *Modern Language Journal, 78*(3), 285-299.

Luckner, J., & Cooks, C. (2010). A summary of the vocabulary research with students who are deaf or hard of hearing. *American Annals of the Deaf, 155*(1), 38-67.

Lomicka, L. L. (1998). To Gloss or not to gloss: An investigation of reading comprehension online. *Language Learning & Technology, 1* (2), 41-50. Retrieved February 7, 2008, from http://llt.msu.edu/vol1num2/article2/default.html.

Luppescu, S., & Day, R.R. (1993). Reading, dictionaries, and vocabulary learning. *Language Learning, 43*(2)*,* 263-279.

Meara, P. (2002). The rediscovery of vocabulary. *Second Language Research, 18*(4), 393-407.

Mountain, L. (2015). Recurrent prefixes, roots, and suffixes. A morphemic approach to disciplinary literacy. *Journal of Adolescent & adult Literacy, 58*(7),561-567.

Nattinger, J. (1988). *Some current trends in vocabulary teaching.* In Carter, R & M. McCarthy (Eds.), *Vocabulary and Language Teaching.* London: Longman.

Nation, I. S. P. (2001). *Learning vocabulary in another language.* Cambridge: Cambridge University Press.

Nation, I. S. P. (2003). Vocabulary in D. Nunan (Eds.), *practical english in language teaching* (pp.129-152). New York: McGraw Hill.

Nation, P. (2007).Teaching vocabulary. *Asian EFL Journal, 7,* 1-9.

Oxford, R. L. (1990). *Language Learning Strategies: What every teacher should know*. Boston: Heinle and 323 Heinle.

Pallant, J. (2013). *A step by step guide to data analysis using IBM SPSS.* England, McGraw Hill. Open University Press.

Pulido, D., & Hambrick, D.Z. (2008). The virtuous circle: Modeling individual differences in L2 reading and vocabulary development. *Reading in a Foreign Language, 20*(2), 164-190.

Robinson, P. (1991). *ESP Today: A Practitioner's guide*. Hemel Hempstead: Prentice Hall International.

Schmitt, N. (2000). *Vocabulary in language teaching.* Cambridge: Cambridge University Press.

Schmitt, N. (2005). Current trends in vocabulary learning and teaching. In J. Cummins & C. Davison (Eds.), *International Handbook of English Language Teaching* (pp.827-841). Dordrecht, Boston: Kluwer Academic Publishers.

Vela, V. (2015). Using glosses for incidental vocabulary acquisition. Retrieved from http//creativecommons.org/ Licenses/by-nc-nd/4.0/

Webb, S. (2009). The effects of pre-learning vocabulary on reading comprehension and writing. *Canadian Modern Language Review, 3*, 441-70.

Xhaferi, B. (2010). *Teaching and learning ESP vocabulary*. Macedonia: South East European University

Xu, J. (2010). Using multimedia vocabulary annotations in L2 reading and listening activities. *CALICO Journal, 27*(2),311-327.

Yanguas, I. (2009). Multimedia glosses and their effect on L2 text comprehension and vocabulary learning. *Language learning and technology, 13*(2), 48-67.

Zarei, A., & Hasani, S. (2011). The effects of glossing convention and production. *The journal of teaching language Skills (JTLS), 3*(2), 209-233.