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The effect of vocabulary size and vocabulary depth on reading in EFL context

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Abstract

The aim of this study is to determine the effects of vocabulary size and vocabulary depth on reading performance in EFL context. To this end, Vocabulary Size Test by Nation and Beglar (2007), Words Associate Test by Read (1998), and a reading performance test, the reliability of which was found to be .81 were administered to 361 university students. In the analysis of the data, linear regression and Pearson correlation statistics were used. The results showed that vocabulary size and vocabulary depth were both significantly correlated to reading performance, but vocabulary depth predicted reading performance better.

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Keywords: Vocabulary; depth of vocabulary; size of vocabulary; reading; EFL context.

1. Introduction

The relationship between vocabulary and reading has been a well-established notion among the teachers of English as a foreign language and language teaching theoreticians. There is no doubt that reading in English and the vocabulary knowledge of learners of English as a foreign language are directly related to each other. Anderson and Freebody (1981) state that it is the general vocabulary knowledge of the reader that best predicts how well that reader understands the text. Nagy (1988) states that vocabulary is fundamental to comprehension of various texts and that vocabulary teaching should be an integral part of language education. While there is a consensus on the importance of vocabulary in reading performance, ideas on how vocabulary should be taught and how much of it should be given to the learners may vary. While some put forward that vocabulary should be taught explicitly in

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classrooms, some others came up with different ways to teach vocabulary. Nagy, Herman and Anderson (1985) coined the term incidental vocabulary learning, stating that students can learn vocabulary through repeated exposure to those vocabulary items in various contexts, as is the case in native language acquisition. They further add that explicit instruction of vocabulary items cannot account for the multitude of items students learn; therefore, Nagy and Herman (1987) suggested that teachers should expose the students to extensive reading, leading to greater vocabulary growth than any other explicit instruction program. While vocabulary is generally seen as the facilitator of reading performance, what Nagy, Herman and Anderson (1985), and Nagy and Herman (1987) suggested is the facilitator of reading in learning vocabulary. Huckin and Coady (1999) also state that incidental vocabulary learning is the key to vocabulary acquisition for reading performance of students. On the other hand, Lee (2003) came up with the finding that explicit instruction of vocabulary based on teachers' directions yielded fruitful results and significantly developed students' reading and writing skills. Taylor et al. (2009) also propose that explicit support for vocabulary besides explicit vocabulary strategies will help students greatly in comprehension of various texts that they encounter. Some others; however, suggest teaching vocabulary in context and that teaching discreet vocabulary items would not be of much benefit to learners. Sternberg (1987) claims that most vocabulary can be learned from context and that teaching students new vocabulary items through contexts can be highly effective and can yield better results for them.

Another issue to be elaborated on in the relationship between vocabulary knowledge and reading is how much vocabulary and what vocabulary should be taught to students to facilitate their reading comprehension. Zhang and Anual (2008) reported that knowing 2000-3000 words in a foreign language was correlated to reading comprehension for short answer tasks. Laufer (1992) came up with similar results and suggested that 3000 words predicted reading performance of students best. Saragi, Nation and Meister (1978) state that a learner of English needs to know at least 3600 words to be able to understand unsimplified texts in English, warning that the number of meanings learners should know must be far higher than this number. As can be seen in this proposition, how deeply learners must know the meanings of words matters as much as how many words they know. Hu and Nation (2000) propose that in order to understand a text unassisted, at least 98% of the words in this text need to be known by a reader, which means that if there are 50 words in a sentence, the reader must know at least 49 of the words to be able to understand that text without any outside help. In this point, inferencing comes to the fore, which refers to a reader's inferring the meaning of an unknown item in a discourse from contextual clues. Nassaji (2004) found that lexical inferencing skills and strategies of students were significantly related to the depth of vocabulary. Therefore, comprehension of a text depends more on the depth of vocabulary rather than the number of words a reader knows in a text. On what vocabulary to teach to the learners of English, one of the most famous corpora belongs to West (1953) who came up with *General Service List* containing about 2000 high-frequency words of English. Nation (2004) claims that the first 2000 words from British national Corpus are more suited to teaching students because 80-90% of those 2000 words are encountered in texts. As is the case in how to teach vocabulary, there is no consensus on what words to teach, either. Besides general vocabulary, learners of English could also be taught the academic words of English. For this, Nation and Chung (2009) propose the use of the Academic Word List by Coxhead (2000). Furthermore, Nation and Chung (2009) also suggest teaching technical and low-frequency words so that 98%of coverage could be met by learners of English in reading. Hirsh and Nation (1992) also reported the need for a thorough acquisition of more than 3000 words by learners of English for reading texts.

Besides the number of words and the quality of words to teach, the issue of how deeply words should be taught has become one of the hotly debated issues in recent decades. Qian (1999) put forward that in addition to breadth of vocabulary, there should be another dimension of vocabulary teaching, and he coined the term "depth of vocabulary" to refer to that dimension, which could involve such components as pronunciation, spelling, meaning, register, frequency, and morphological, syntactic, and collocational properties, each interacting with the others so that the best comprehension can be achieved. Qian (2002) states that vocabulary items are acquired in an incremental manner, which refers to the fact that the earlier an item is learned, the deeper the learner knows this word. Even though Qian (2002) does not rule out the importance of the number of words a learner knows, he stresses the importance of depth of vocabulary in guessing the meaning of unknown words in a text, thereby rendering the text more comprehensible.

A lot of studies can be found in literature regarding the relationship between breadth of vocabulary and size and vocabulary, and their effects on reading performance. The present study also sets out to find the relationship between the size of vocabulary and depth of vocabulary besides the effects of those two notions on EFL students' reading performance. This study is innovative in that it aims to come up with a clear understanding of which one of those

two notions predict reading performance better besides determining the combining effects of them on reading performance. To this end, this study aims to find whether there is any correlation between size of vocabulary and depth of vocabulary; whether there is a correlation between size of vocabulary and reading performance, whether there is a correlation between depth of vocabulary and reading performance; and whether it is the size of vocabulary or depth of vocabulary that predicts reading performance better in an EFL context.

2. Method

This part contains information regarding the data collection tools, participants, data collection procedure and data analysis.

2.1. Data collection tool

In order to collect data about the vocabulary size of the students, the Vocabulary Size Test by Nation and Beglar (2007) was used. Beglar (2010) conducted rasch-based validation and reliability of the test and reported his finding to be .96, which points to a high level of validity and reliability. There are 14 sets of vocabulary items in this test, each set containing 10 items. Each of these items is the representative of 100 words, which refers to the fact that each set measures 1000 words with 10 representative words. Nation (2012) warns that this test aims to measure receptive vocabulary knowledge, stressing that it measures the needed vocabulary knowledge for reading. Each item is provided in a relatively context-independent multiple choice format. There are four choices for the item provided in a context-independent sentence and the test-takers are asked to choose the best definition of the item in the options. It is important to note that test-takers cannot guess the meaning of the item from the sentence it was provided in as the sentence does not allow for any context. Considering that each item represents 100 words, and there are 10 items in each of the 14 sets, the knowledge of a total of 14,000 words are measured through 140 items in this test.

As another data collection tool, the Words Associate Test by Read (1998) was administered to students to measure their depth of vocabulary. This test was adapted by Qian (1999), and its reliability was found to be 0.88 by Qian (2002). In his own reliability check of the primitive form of the test, Read (1993) found that its reliability level was at least .90. There are 40 stimulus words in this test, all of which are adjectives and free from context. Under the stimulus words, there are 8 options, among which test-takers are asked to choose 4 considering which ones are close in meaning to the stimulus word or which noun can come after those stimulus words, thereby forming collocations.

As the last data collection tool, a reading achievement test was developed by the researchers of the present study. In the initial test, there were 45 items and 5 paragraphs, each including 9 multiple choice questions. To check the reliability of the test, it was administered to 101 students first. The data obtained in the reliability check were analyzed through ITEMAN. As a result of the reliability check, it was seen that 10 items had to be removed from the test because their point bi-serial value was well below .30, which is the critical point for an item to be included in a test. Removing those 10 items, it was seen that the reliability of the test turned out to be .81, which refers to a reliable test considering that the critical value is assumed to be.70.

2.2. Participants

The study was conducted on 361 students studying in preparatory programme of Duzce University, School of Foreign Languages in spring semester of 2013-2014 academic year. Those participants had been attending to English lessons for 24 hours a week for 8 months. The participants were from various faculties of the university, namely Tourism Faculty, Engineering Faculty, Forestry Faculty, and Business and Administration Faculty. The gender demographics of the participants are given in Table 1 below.

Table 1. The genders of participants

Gender	Frequency	Percent
Male	195	54
Female	166	46
Total	361	100

As can be seen from Table 1, a total of 361 participants took part in the study. Of those 361 participants, 195 were male (54%) while 166 were female (46%). The reason for the slightly higher number and higher percent of male participants could be attributed to the fact that there are more male students than female students in Engineering Faculty as a whole, while no such a tendency can be observed in other faculties.

2.3. Data collection procedure

Vocabulary Size Test was administered to the participants first. They were instructed to choose the option that best describes the meaning of the stem word and do all the 14 sets of items. They were told not to make a random choice but rather decide carefully. Participants were given 70 minutes to do the test because there was no context and they were supposed to choose the option provided that they knew the meaning of the stem word. Following the Vocabulary Size Test, Words Associate Test was administered for 40 minutes. The participants were asked to choose 4 of the 8 options under the stimulus word. They were also told that these options can be the synonyms or close meanings of the stimulus word or the nouns that are frequently used with the stimulus word to make up collocations. Lastly, reading achievement test was administered for 35 minutes. Participants were told that false answers did not count and only their correct answers would be taken into consideration.

2.4. Data analysis

The data obtained were analyzed through SPSS 16.0. Percentage and Frequency statistics were used to describe the participant demographics. In analyzing the data, linear regression was used to determine the effects of breadth of vocabulary and depth of vocabulary on reading performance; besides that, multiple linear regression was used to see whether breadth of vocabulary or depth of vocabulary predicted the students' reading performance better. Moreover, Pearson correlation was used to determine the correlation between the breadth of vocabulary and depth of vocabulary.

3. Results

This part of the study reveals the results of the data analysis regarding the relationship between size of vocabulary and depth of vocabulary; the relationship between vocabulary size and reading performance; the relationship between vocabulary depth and reading performance besides the predictor value of size of vocabulary and depth of vocabulary in reading performance of students in an EFL context. It is important to note that the relationship between vocabulary size and reading performance, and the relationship between vocabulary depth and reading performance were analyzed through Pearson correlation in isolation first. Seeing that there was a significant relationship between each of those independent variables and the dependent variable, that is reading performance, it was decided to go one step further and to find out which one of those independent variables predict reading performance better.

3.1. The relationship between size of vocabulary and depth of vocabulary

The relationship between size of vocabulary and depth of vocabulary was found through Pearson correlation statistics. Table 2 shows the results of this analysis.

Table 2. The relationship between size of vocabulary and depth of vocabulary

		Vocabulary size	Vocabulary depth
Vocabulary size	Pearson Correlation	1	.513**
	Sig. (2-tailed)		.000
Vocabulary Depth	Pearson correlation	.513**	1
	Sig. (2-tailed)	.000	

Correlation is significant at the 0.01 level (2-tailed).

As can be seen in Table 2, there is a strongly significant relationship between vocabulary size and vocabulary depth as indicated with the significance value .000, considering $p < .05$. From this result, it would be safe to conclude that there is a positive correlation between vocabulary size and vocabulary depth. In other words, the higher the numbers of words foreign language learners know, the more deeply they can use words in reading skill. This can help foreign language teachers and learners that knowing a lot of vocabulary items in a language may refer to the fact that their knowledge of vocabulary depth could increase, as well. However, this may also signify that their knowledge of vocabulary depth may also have contributed to their memory of vocabulary.

3.2. The relationship between size of vocabulary and reading performance

The relationship between size of vocabulary and reading performance was found through Pearson correlation statistics. Table 3 shows the results of this analysis.

Table 3. The relationship between size of vocabulary and reading performance

		Reading score	Vocabulary size
Reading score	Pearson Correlation	1	.429**
	Sig. (2-tailed)		.000
Vocabulary size	Pearson correlation	.429**	1
	Sig. (2-tailed)	.000	

Correlation is significant at the 0.01 level (2-tailed).

As can be seen in Table 3, there is a strongly significant relationship between vocabulary size and reading score as indicated with the significance value .000, considering $p < .05$. This result may mean that the students who know a higher number of vocabulary items may do better in reading, or alternatively the students who perform better in reading know more vocabulary items.

3.3. The relationship between depth of vocabulary and reading performance

The relationship between depth of vocabulary and reading performance was found through Pearson correlation statistics Table 4 shows the results of this analysis.

Table 4. The relationship between depth of vocabulary and reading performance

		Vocabulary depth	Reading score
Vocabulary depth	Pearson Correlation	1	.450**
	Sig. (2-tailed)		.000
Reading score	Pearson correlation	.450**	1
	Sig. (2-tailed)	.000	

Correlation is significant at the 0.01 level (2-tailed).

As can be seen in Table 4, there is a strongly significant relationship between vocabulary depth and reading score as indicated with the significance value .000, considering $p < .05$. This shows that if students know vocabulary items in depth, they may do better in reading, or alternatively if they are good at reading skill in English, they may enjoy deep understanding of words in English.

3.4. The effect of vocabulary size and vocabulary depth on reading performance

The relative effects of vocabulary size and vocabulary depth on reading performance were found through multiple linear regression. Table 5 shows the results of this analysis.

Table 5. The effect of vocabulary size and vocabulary depth on reading performance

	Beta	t	Sig.
Vocabulary depth	.312	5.866	.000
Vocabulary size	.269	5.061	.000

Dependent variable: reading score.

As can be seen in Table 5, both vocabulary size and vocabulary depth contribute to reading performance in English. It would be safe to conclude from these results that if students know more vocabulary items with greater depth, they can do better in reading skill, as indicated with the significance value .000, considering $p < .05$. This result also lends itself to safely concluding that vocabulary depth predicts students' reading performance better than vocabulary size as indicated with the result of Beta value .312 and t value 5.866 for vocabulary depth while the Beta value is .269 and t value is 5.061 for vocabulary size as prediction strength for the dependent variable reading score.

4. Conclusion

As can be seen from the results, a strongly significant relationship was found between vocabulary size and vocabulary depth. Even though this result does not conclusively show which variable predicts the other one, we can safely draw the implication that students knowing a lot of vocabulary items also know those items more deeply. This result is in line with previous studies in related literature. Qian (1999) found a highly positive correlation between breadth of vocabulary and depth of vocabulary. Li and Kirby (2014) conducted a study on the relationship between depth of vocabulary and size of vocabulary, and they found that breadth of vocabulary is moderately correlated with depth of vocabulary. The results obtained in the present study and other studies in literature clearly show that there is a positive correlation between size of vocabulary and depth of vocabulary, which may serve as a backbone of vocabulary teaching in an EFL context for English teachers. Teachers should make sure that they teach as many related vocabulary items and as deeply as possible, whatever their aim is, whether for basic interpersonal communication skills or for academic purposes. Teachers should also ensure that as they are teaching more

vocabulary items, students are learning them more deeply, or alternatively, as students are learning vocabulary items more deeply, they are also increasing their vocabulary memory.

Another result obtained in this study is that there is a highly positive correlation between vocabulary size and reading performance. This result is in accordance with the results of the previous studies in related literature. Henriksen, Albrechtsen and Haastrup (2004) found a strong relationship between vocabulary size and reading tests in L2, but they also suggested that success in reading cannot be only tied to the vocabulary size of students, but some external factors such as lexical inferencing skills may also have played a role in the reading performance of students. Stæhr (2008) conducted a study on 88 EFL learners and found that learners' receptive vocabulary size is strongly associated with their reading and writing skills, suggesting that 2000 vocabulary level is a crucial goal for low-level EFL learners. Another support for the results of this study comes from the study of Li and Kirby (2014) suggesting that breadth of vocabulary had strong effect on reading performance. Seeing those results, it may be possible to draw the implication that EFL teachers should expose students to as many vocabulary items as possible so that their comprehension level will develop. However, it is not that teachers bring any kind of vocabulary to the lesson, it is rather that teachers should determine the vocabulary to be taught in line with their purpose in EFL context. However, as already suggested by Laufer (1992) and Saragi, Nation and Meister (1978), the number of related vocabulary to be taught in classrooms must be no fewer than 3000 and 3600 words, respectively.

Another significant relationship was found between depth of vocabulary and reading performance in the present study. This finding can be confirmed with the studies in related literature. Nagy and Herman (1987) also came up with the suggestion that a learner's reading performance depends on his size of vocabulary and depth of vocabulary. Qian (2002) also stated that dimension of vocabulary knowledge was as important as breath of vocabulary knowledge in predicting the reading performance of learners. Therefore, teaching vocabulary items in depth will contribute to the reading performance of students greatly.

The last finding of the present study was that even though both vocabulary size and vocabulary depth predicted reading performance of EFL students greatly, vocabulary depth predicted reading performance better. Vermeer (2001) found no distinction between vocabulary size and vocabulary depth in general acquisition of L2. However, when it comes to a major skill like reading, Qian (1999) stated that depth of vocabulary made a unique contribution to predicting reading performance. Nassaji (2004) suggested that depth of vocabulary knowledge made a significant contribution to inferencing in reading, which is very important for students' comprehension of texts even when they encounter unfamiliar words in the passage. Li and Kirby (2014) stated that vocabulary depth contributed to summary writing while breadth of vocabulary had a stronger predictive value for reading comprehension, which is a conflicting finding with the present study. Kaivanpanah and Zandi (2009) reported that depth of vocabulary can predict reading to a great extent, but they add that grammatical knowledge predicts reading performance better and knowledge of collocations is related to grammar background of learners. Even though there are findings in the literature to the opposite of the present finding, there are also some studies giving credit to the present finding that depth of vocabulary predicts reading performance than breadth of vocabulary. Therefore, teachers should attach prime importance to depth of vocabulary that they teach in EFL classrooms to enable students to improve their reading performance.

All in all, both vocabulary size and vocabulary depth contribute enormously to reading performance in EFL context, the latter one predicting the reading performance better, though. Curriculum developers and course book writers should attach as much importance to depth of vocabulary as they do to size of vocabulary for EFL contexts. EFL teachers should design their lessons in such a way that they should be able to enable the students to learn the vocabulary items they are exposed to in their depth because it is the depth of vocabulary knowledge that determines the comprehension level in reading.

Further studies could be conducted on the interplay of breadth of vocabulary and depth of vocabulary in reading performance. Longitudinal studies are needed to determine to what extent depth of vocabulary and breadth of vocabulary contribute to and predict reading performance in EFL contexts. These longitudinal studies could obtain data from students from lower level to higher level, measuring their size of vocabulary, depth of vocabulary and reading performance in each level of English learning and coming up with findings regarding how much vocabulary helps students achieve higher performance in reading and when students' depth of vocabulary starts to improve and even surpass breadth of vocabulary, in this way predicting their reading performance better.

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