ISSN:1991-8178

Australian Journal of Basic and Applied Sciences

Journal home page: www.ajbasweb.com

Do Breadth and Depth of Vocabulary Knowledge Aid Reading Comprehension?

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ARTICLE INFO

Article history:
Received 13 June 2015
Accepted 28 July 2015
Available online 5 August 2015

Keywords:
Reading comprehension, vocabulary size, vocabulary breadth, vocabulary depth

ABSTRACT

Reading is seen as a vital skill for students to acquire knowledge, and researchers have found that lexicon is important in reading. In fact, English as Second Language (ESL) vocabulary researchers continuously debate the amount of vocabulary L2 readers need in order to comprehend the reading texts. This paper is mainly to explore the correlation between the breadth and depth of vocabulary knowledge and the score of reading test. The results showed that (a) the correlation between breadth (VST), depth (DVK) and reading test (RT) scores were positive, and (b) vocabulary breadth is the better predictor of reading comprehension ability. The findings suggest that the students' vocabulary breadth has the ability to predict the students' reading performance. Students who have larger lexicon size achieve better comprehension score; as a result, they are able to understand reading texts better.

To Cite This Article: Tengku Shahraniza Tengku Abdul Jalal, Raeidah Ariff, Isma Suhaila Ismail, Al-Mansor Abu Said, Do Breadth and Depth Aid Reading Comprehension? ***Aust. J. Basic & Appl. Sci.,*** *9(25) 50-55, 2015*

INTRODUCTION

The current speed of global development requires more and more literate citizens. Thus the increase in literacy demand has risen (Krashen 2013). English, no doubt, is the third widely-spoken language in the world, and has become the popular choice as a second language. Some non-native countries, like Malaysia, may even have English as a medium of instruction in some of the universities. However, English is becoming increasingly challenging for students especially in reading and comprehension. Students need to read and comprehend texts in English, not only for academic success, but also for their future career. Long (2013) stated that literacy (the ability to read and write) is vital in ensuring that graduates will be able to possess a productive job, and literacy is considered as the highest predicator in job employment. To ensure this, graduates must equip themselves with the essential knowledge and expertise through a lot of reading. Thus, reading is important for students' future success.

In order for students to acquire knowledge, past researchers have found that lexicon plays a very important part in reading comprehension. Singleton (1999) explained that the most difficult part of understanding either L1 or L2 is in the 'nitty-gritty' of the lexicon. Mehrpour, Ramzjoo and Kian (2011), further explained that it would be difficult for the learner to either produce or recognize the language if the knowledge of words is ignored. Even though comprehension is more than knowing words and memorizing the meanings, knowledge of words could help students to perform better in their reading comprehension. Students who do not know meanings of words could face difficulties in understanding the idea of the passage (Chall and Jacobs, 2003).

Based on numerous studies conducted, vocabulary knowledge and reading ability have significantly showed positive correlation. According to Nation (2001), even though knowledge of words is not the only aspect contributing to comprehension, it can be an "accurate predictor" of the difficulty of a certain text. In fact, ESL vocabulary researchers debate that the size of vocabulary L2 readers need is vital in an attempt to achieve understanding of reading texts. However, the required vocabulary size seems to differ according to factors such as the genre of the text, the content domain knowledge required, and the purpose of the reading (Koda, 2004).

The main objective of this study is to explore the correlation between vocabulary knowledge and reading test, and specifically looking into the following objectives:

(1) To investigate the correlation between vocabulary size or breadth and reading test

(2) To investigate the correlation between vocabulary depth and reading test

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The following research questions are then formulated:

(1) Do vocabulary size and reading test scores correlate with one another?

(2) Do vocabulary depth and reading test scores correlate with one another?

(3) Which vocabulary knowledge is the best predictor of reading test performance?

Literature reviews:

According to Sedita (2005), for a reader to grasp the main idea and to guess unfamiliar words in the text correctly, knowing at least 90 per cent of the words in the passage is vital. In contrast, a reader who does not know at least 90 per cent of the words will have problems in comprehending the passage and also missing out the chance to learn new words.

Several models have been suggested by researchers to define the correlation between knowledge of vocabulary and reading. Three hypotheses proposed by Anderson and Freebody (1981) are the instrumentalist, aptitude and knowledge. According to instrumentalist, vocabulary knowledge acts as the main contributing factor in better comprehension and word knowledge aids reading comprehension. The aptitude hypothesis suggests that general underlying verbal skill can affect the relationship between vocabulary knowledge, for example, the skill to recognize verbal description. The knowledge hypothesis views vocabulary knowledge as a measure of reader's prior knowledge. The readers will have difficulties to understand the text if they do not know anything about the subject. In addition, Mezynski (1983) introduced the access hypothesis which is similar with the instrumentalist that suggests the connection between vocabulary knowledge and reading comprehension is causal, provided that the words can be easily accessed (speed of word recognition, speed of coping with affixed forms, and fluency of lexical access).

In recent years, vocabulary knowledge has been noted to be important in predicting the reader's overall reading performance. Shen (2008) believed that L2 learners who are proficient in reading in their first language will find it challenging to begin to read in their target language when there is insufficient vocabulary knowledge in the target language. Shen (2008) further reiterated that the connection between vocabulary knowledge and reading is "complex and dynamic". Studies have shown that knowing and understanding more words is one of the best predictors of reading comprehension. For example, Stahl (2003) agreed that the correlation between vocabulary knowledge and reading comprehension is strong; moreover, it can also be the main predictor of a reading difficulty. However, it is indeed difficult to come to an agreement on how to measure vocabulary knowledge and what is involved in the process. Nation (1990) proposed that there are eight aspects of word knowledge: spoken, written, grammar, collocation, frequency, stylistic register constraints, conceptual meaning and words relation. Meanwhile, Chappelle (1998) felt that only four dimensions are involved which are the size of the vocabulary, the characteristics of the word, the organization of the lexicon and the process of lexical access. A recent framework by Qian (2002) suggested that there are four features of vocabulary knowledge which are breadth, depth, word organization and accessibility. In the entire framework reviewed, it displays a strong consensus that there are two major dimensions of vocabulary knowledge that should be measured: vocabulary breadth or size and vocabulary depth.

A number of researchers have found that the breadth and the depth of vocabulary knowledge and reading comprehension are highly and positively correlated. According to Shen (2008), of the two types of vocabulary knowledge, depth of vocabulary knowledge significantly contributed to the prediction of reading comprehension score as compared to breadth of vocabulary knowledge. However, in a Malaysian situation, less is known about which aspects of vocabulary knowledge can affect reading comprehension.

In the Malaysian context, Yusop (2012) stated that many test takers of Malaysian University English Test (MUET) struggle with the reading comprehension test. Of the four components in MUET (reading, writing, listening, and speaking), reading comprehension has been given the highest weighting, which is 40 per cent of the total score. This shows that the Malaysian educational policy is emphasizing on the importance of reading skills for students to engage successfully in tertiary education. This is due to the fact that in the second language learning context, reading is perceived as a prominent academic skill for university students. Poor performance on MUET can be seen as one of the indicators of the poor English proficiency problem. In retrospect, Haynes and Baker (1993) argue that insufficient vocabulary in English is the main cause of reading difficulties among L2 readers. Thus, this brings forth the attempt to identify which vocabulary knowledge is a better indicator for success in reading, and to seek the relationship between the types of vocabulary knowledge with reading comprehension.

Theoretical Framework & Research Methodology:

The impetus of this study is a desire to provide an insight of the relationship between breadth and depth of vocabulary knowledge and reading comprehension. While all vocabulary elements are theoretically pertinent in measuring the function of vocabulary knowledge in reading comprehension, only vocabulary breadth and depth will be evaluated in this study. The two independent variables are breadth and depth of vocabulary, and the dependent variable is reading comprehension (see Figure 1).

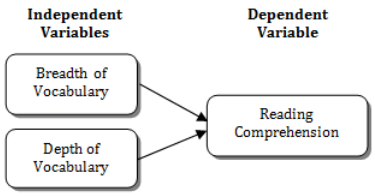

Fig. 1: Theoretical framework of the correlation between breadth and depth of vocabulary and reading comprehension.

Based on the research framework, the following hypotheses were forwarded for testing.

H1: There is a significant relationship between breadth of vocabulary and reading comprehension.

H2: There is a significant relationship between depth of vocabulary knowledge and reading comprehension.

H3: Breadth of vocabulary predicts reading comprehension performance better than depth of vocabulary.

Questionnaire was used in data collection. Samples were randomly selected from 764 third year degree students at Multimedia University, Melaka. Students who have taken MUET at least once were considered to participate in this study. This was to ensure that the students are familiar with the format of MUET Reading test. Thus, using Krejcie and Morgan (1970) sample size table, and using simple random technique (confidence of 99% and margin of error 5%) , a total of 341 sample respondents have been identified. The data collection instruments of this study are: (1) Questionnaire (2) Vocabulary Size Test (VST), (3) Depth-of-Vocabulary-Knowledge (DVK), and (4) Reading Comprehension Test (RT).

(1) Questionnaire:

A questionnaire was given to students in order to gauge their gender, age and MUET test-taking experience.

(2) Vocabulary Size Test (VST):

To measure the breadth or size of the vocabulary knowledge, the Vocabulary Size Test was used. The test was created by Nation (2012). The test has several versions, and for this study, the 20,000 version is used. The test was used to measure the language learner's written receptive vocabulary size in English which is the vocabulary knowledge needed for reading. According to Nation (2012), the items in the test are fairly tested according to the frequency levels of the language, and the levels are based on the British National Corpus word family lists. The test-takers were required to choose the best definition of each word. It used a stem as well as multiple-choice answers, and the occurrence of correct answers was roughly spread across the four choices of *a, b, c, d*. Below is the example of one of the items tested:

27. compost: We need some <compost>.

a. strong support
b. help to feel better
c. hard stuff made of stones and sand stuck together
d. plant material fertilizer

The correct answer for the above question is *d.* In scoring, Nation (2012) said that the test-takers' score need to be multiplied by 200 in order to get their total receptive vocabulary size. Since the study used the 20,000 version that contains 100 multiple choice items, the highest possible score that can be obtained was 20,000.

(3) Depth of Vocabulary Knowledge (DVK):

To measure the test-takers' depth of vocabulary knowledge, The Depth-of-Vocabulary-Knowledge (DVK) test created by Read (1993, 1995) was used. The test was initially known as Word Association Test (WAT). The test was used to measure three vocabulary elements which are synonymy, collocation, and polysemy. The reliability obtained for this measure has reached .93 (N = 94; Read, 1995). This test has 40 items and each item consists of one stimulus word. Each stimulus given is an adjective and below the stimulus, there are two boxes containing four words each. One to three words in the left box can be synonymous to one feature of or the complete meaning of the stimulus word, while one to three words in the right box can be words that collocate with the stimulus word. The test-takers were needed to provide four correct answers for each item; however, these answers were not equally spread. Three conditions were possible: (a) there are two correct answers for both left and right box; (b) there is one correct answer in the left box, and there are three correct answers in the right box; and (c) there are three correct answers in the left box, and there is only one correct answer in the right box. With this arrangement, the chances of guessing were effectively reduced. For example, for the word *Fish:*

Fish:

(A) answer	(B) catch	(A) meeting	(B) person
(C) desk	(D) food	(C) sea	(D) shark

The correct answers for the example above are *catch* and *food* (left box) and *sea* (right box). In scoring, each correct answer is awarded one point; thus, the maximum score is 160.

(4) Reading comprehension Test (RT):

To explore the test-takers' reading comprehension skill, a Malaysian University English Test (MUET) reading test was used. This test was

taken from one of the past-year MUET Reading Test compilations, specifically MUET Reading March 2013. The test comprises of six passages with various themes and lengths. Each passage consists of seven to eight multiple choice questions. The total questions of the test are 45. For each correct answer, one mark is awarded; therefore, in scoring, the maximum possible score is 45. All three tests were administered on the same day.

Data Collection:

The data collection procedure was carried out sequentially in a day. The participants were gathered in a classroom to take the tests in two sessions. For the first session, the two vocabulary knowledge tests, VST and DVK were given to the participants, and in the second session, a MUET Reading test was given.

In conducting data analyzing, the Statistical Package for Social Sciences software (SPSS) was used. Later, the scores of breadth, depth and reading test were computed in order to find the possible relationship among the variables. This study used a two-tailed Pearson correlation to study the relationship of the variables. Meanwhile, multiple regression was used to determine which independent variables is the better predictor of reading test. The scores on the reading test are used as the dependent variable, and the scores on breadth and depth of vocabulary knowledge as the independent variables.

Results:

Samples and Profiles

A total of 341 responses were obtained. From this figure, the gender of the respondents for this study comprised of 126 males (37%) and 215 females (63%). With regard of the age of respondents, 58.4% were between 18 to 22 years old, 40.8% were between 23 to 27 years old, and the remaining (0.9%) were 28 to 32 years old. Respondents were also gauged on their MUET test taking experience. All (100%) of the respondents had taken MUET at least once. The demographic characteristics are tabulated in Table 1.

Table 1: Respondents Demographic.

Respondents Demographic		Frequency	Percentage (%)
Gender	Male	126	37.0
	Female	215	63.0
Age	18-22	199	58.4
	23-27	139	40.8
	28-32	3	0.9
MUET Experience	Yes	341	100.0
	No	0	0.0

Hypotheses Testing:

A two-tailed Pearson correlation was used to explore the relationship between vocabulary breadth and reading comprehension. Both scores gained from the data collection were computed and based on Table 2, the result displays that the correlation between vocabulary breadth and reading test is .58 (r=.58). The significant value for the relationship is less than 0.01 ($p<0.01$); thus, both scores are positively correlated.

Table 2: Correlation between Vocabulary Breadth (VST) and Reading Test (RT).

		RT	VST
RT	Pearson Correlation	1	.579**
	Sig. (2-tailed)		.000
	N	341	341
VST	Pearson Correlation	.579**	1
	Sig. (2-tailed)	.000	
	N	341	341
**. Correlation is significant at the 0.01 level (2-tailed).			

To find the correlation between vocabulary depth (DVK) and reading test (RT), a two-tailed Pearson correlation was used. Both scores were analyzed and tabulated in Table 3. Based on Table 3, the correlation of both scores receives .42 (r=.42). Looking at the significant value depicted in Table 2, both scores (vocabulary depth and reading test) receive 0.01 ($p<0.01$). Here it shows that vocabulary depth and reading test is positively correlated.

Table 3: Correlation between Vocabulary Depth (DVK) and Reading Test (RT).

		RT	DVK
RT	Pearson Correlation	1	.420**
	Sig. (2-tailed)		.000
	N	341	341
DVK	Pearson Correlation	.420**	1
	Sig. (2-tailed)	.000	
	N	341	341
**. Correlation is significant at the 0.01 level (2-tailed).			

From the output of regression from the ANOVA table (Table 4), the variables were tested significant with ($p<.05$) and F = 89.83. The regression tests had presented a moderate inference with R square of .348. Approximately 34.8% variations of Reading Test score can be explained by VST score and DVK scores. Multicollineraity problems did not exist as the variance inflation factor (VIF) values were 1.493 (below 10) and the condition indices were below the safety limit of 30. The adjusted R square value is .343. The beta value (standardize coefficients) of VST result (β=.504) and DVK result (β=.130) indicated that the independent variables are positively related to Reading test result.

Table 4: Correlation between Vocabulary Depth (DVK) and Reading Test (RT).

Variable	Standardized Coefficients
VST	.504**
DVK	.130*
F	89.836
R^2	.347
Adjusted R^2	.343

Note: **p<0.01, *p<0.05

VST score was accepted at $p<.01$ and DVK score is positively related to Reading test score, was accepted at $p<.05$.

Discussions:

The outcome confirms that both aspects of vocabulary knowledge, which are breadth and depth, influence the reading comprehension performance. Although the result showed that the breadth correlated stronger than vocabulary depth, the values of the correlation coefficients obtained between both types of vocabulary knowledge do not vary significantly. Additionally, the result of this study is fairly close to other similar studies conducted by Moinzadeh and Moslehpour (2012), Qian (2002), Mehrpour *et al*. (2012), and Shen (2008).

Based on the result of the multiple-regression analysis, both breadth and depth contributed significantly to predict the performance of the reading comprehension; yet, the size or breadth of vocabulary knowledge is better in predicting the reading comprehension performance. Similar to Moinzadeh and Moslehpour's (2012) study, the size of the second language learners' vocabulary knowledge has stronger relationship and contributes significantly to the performance of reading comprehension. Even though vocabulary breadth and depth contribute to better reading score, this finding shows that the relationship is moderate with 34.8%.

Conclusions:

This study is to investigate the correlation between vocabulary knowledge, namely breadth and depth, and reading comprehension. This study clearly shows that vocabulary knowledge (breadth and depth) helps to aid better comprehension towards reading.

Based on the findings of this study, all hypotheses are supported with empirical evidence. Both vocabulary breadth and depth correlate significantly to the better performance of reading comprehension. Moreover, breadth of vocabulary knowledge provides the stronger contribution to predict the outcome, which in this case is the ability to achieve higher score in reading test. Nevertheless, both aspects of vocabulary knowledge do aid in better comprehension of reading.

Reading, primarily in ESL, is an important skill especially for university students to develop their knowledge and gain better understanding of their respective fields. Based on the findings, it can be concluded that the size of vocabulary knowledge plays a significant role in predicting the students' reading performance. Students who have larger lexicon size achieve better comprehension score, which shows that they are able to understand the text better.

English is an important language in Malaysia, for it is an active second language and serves as a medium of instruction in most universities. Furthermore, pre-university students are required to take Malaysian University English Test (MUET) in order to bridge the gap of English language needs. The findings of this study could be useful for curriculum designers to plan a better ESL syllabi and materials. Vocabulary knowledge should be seen as one of the important factors for reading comprehension success; sadly, these aspects are often ignored and regarded as not important in improving the reading skills. The implementation of vocabulary teaching should be acknowledged and implemented in every level of formal education specifically in the L2. From the findings of the study, vocabulary breadth and depth only affects 34.8% of the L2 reading comprehension score. Therefore, future researches should also look onto other aspects of the success of reading comprehension.

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