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## Relationship between Vocabulary Size and Reading Comprehension Levels of Malaysian Tertiary Students

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### ABSTRACT

This study investigated the relationship between vocabulary size and reading comprehension performance among students in a tertiary institution in a Malaysian context and examined the vocabulary size required for students to achieve reading comprehension at various levels of proficiency. The research questions that guided this study were: 1) What is the vocabulary size of second year diploma students studying Mass Communication?; 2) What is the reading comprehension proficiency of second year diploma students studying Mass Communication?; and 3) What vocabulary size is required for different levels of reading comprehension proficiency? This study used the quantitative approach. The participants were 53 Malaysian second-year students at a private university college in Malaysia who were reading for their Diploma in Mass Communication. The instruments used were the Vocabulary Size Test and the IELTS Reading Test (Academic Module). The findings showed that the average vocabulary size of the students was just over 6000 word families and this vocabulary size was generally insufficient for adequate reading comprehension. Students needed an average vocabulary size of about 8000 word families to achieve adequate reading comprehension and about 10000 word families to achieve proficient reading comprehension. Based on the individual student's performance, this study did not find a linear relationship between vocabulary size and reading comprehension performance, nor was there a threshold vocabulary size for adequate reading comprehension.

**Keywords:** *ESL Learners, IELTS Academic Reading, Reading Comprehension, Malaysian Tertiary Learners, Vocabulary Size, Vocabulary Size Test*

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### 1. Introduction

One of the most fundamental components in language learning is vocabulary. Learners need to know the vocabulary of a language in order to be able to use the language in a functional manner whether it is for speaking, listening, reading or writing. In an academic setting, reading is a very important skill for tertiary students to cope with their academic tasks and research has shown that having sufficient vocabulary is essential for reading comprehension (Hu & Nation, 2000; Kameli & Baki, 2013; Laufer & Ravenhorst-Kalovski, 2010; I. S. P. Nation, 2006; Qian, 2002; Schmitt, Jiang, & Grabe, 2011; Stæhr, 2008).

In Malaysia, various studies were conducted (Harji, Balakrishnan, Bhar, &

Letchumanan, 2015; Ibrahim, Othman, Sarudin, & Muhamad, 2013; Ibrahim, Sarudin, & Muhamad, 2016; Kaur, Othman, & Abdullah, 2008; Kaur, 2013; Mathai, Jamian, & Nair, 2008; Mokhtar, 2010; Mokhtar et al., 2010) to measure the vocabulary size of Malaysian tertiary students and the results showed that Malaysian tertiary students have limited English vocabulary, which is only a mastery of between 1000 and 3000 word families. These studies, however, used various versions of the Vocabulary Levels Test (Schmitt et al. 2001; Nation & Laufer 1999; Laufer & Nation, 1983, 1990, 1995; Nation 1990), which is a diagnostic test that measures students' mastery of vocabulary at different vocabulary levels rather than the students' vocabulary size.



Nevertheless, these figures were used to compare Malaysian tertiary students' vocabulary size to the vocabulary size expected of second language (L2) learners, such as 2000-3000 word families for basic language use (P. Nation & Waring, 1997) and 8000-9000 word families for L2 learners studying advanced degrees at English-medium tertiary institutions (I. S. P. Nation, 2006).

Previous studies on vocabulary size and reading comprehension largely focused on their correlation and the findings generally suggest that there is a positive correlation (e.g. (Baleghizadeh & Golbin, 2010; Ibrahim et al., 2016). However, for ESL educators and learners, the vocabulary question that often arises is how much vocabulary is sufficient. I. S. P. Nation & Beglar (2007) stressed that 'the goal of around 8000 word families is an important one for learners who wish to deal with a range of unsimplified [...] written texts' (p.9). However, only a few studies (Laufer & Ravenhorst-Kalovski, 2010; Milton & Hopkins, 2006; I. S. P. Nation, 2006) that investigated the vocabulary size needed for reading comprehension provided data on the vocabulary size needed for reading comprehension at different proficiency levels. Therefore, this research aimed to investigate Malaysian tertiary students' vocabulary size using a non-diagnostic test in order to obtain data about their vocabulary size (as opposed to their mastery of vocabulary levels) as well as to study the relationship between the students' vocabulary size and their reading comprehension performance in order to identify the vocabulary size needed for different levels of reading comprehension proficiency. This information would be useful especially for educators to cater to the needs of their students since different levels of reading comprehension proficiency would be required for the achievement of different tasks and purposes.

The research questions that guided this study were: 1) What is the vocabulary size of second year diploma students studying Mass Communication?; 2) What is the reading comprehension proficiency of second year diploma students studying Mass Communication?; and 3) What vocabulary size is required for different levels of reading comprehension proficiency?

## [2. Literature Review](#)

### [2.1 Vocabulary Knowledge](#)

Vocabulary knowledge is undeniably important in any reading comprehension task. However what defines vocabulary knowledge is complex and involves many dimensions. This has been of interest to many researchers and the development of the vocabulary framework by them (Cronbach, 1942; Richard, 1976; Nation, 1990, 2001; Qian, 1998, 2002; Chapelle, 1998; and Henriksen, 1999) have been cited by various researchers (Kameli & Baki, 2013; Moinzadeh & Moslehpour, 2012; Mehrpour et al., 2011; Shen, 2008). The receptive-productive distinction in vocabulary knowledge was introduced by I. S. P. Nation (1990). Basically receptive vocabulary involves the ability to recall the meaning of a word while productive vocabulary involves the ability to use words correctly to express the required meaning (Šišková, 2012). Therefore, listening and reading tasks would require receptive vocabulary knowledge while speaking and writing tasks would require productive vocabulary knowledge.

Other than the receptive-productive distinction, researchers (e.g. Mehrpour, Razmjoo, & Kian, 2011; Moinzadeh & Moslehpour, 2012; Qian, 1999, 2002; Shen, 2008) also studied vocabulary knowledge in terms of vocabulary size (sometimes referred to as vocabulary breadth) and vocabulary depth. Vocabulary size refers to 'the number of words for which a learner has at least some minimum knowledge of meaning' while depth of vocabulary refers to 'a learner's level of knowledge of various aspects of a given word' (Qian, 1999) such as phonemic, morphemic, syntactic, semantic, collocational and other properties (Qian, 2002). Researchers often studied the size and/or depth of learners' vocabulary and used these as measures to determine learners' language skills (Mehrpour, Razmjoo, & Kian, 2011; Moinzadeh & Moslehpour, 2012; Qian & Schedl, 2004; Qian, 2002; Read, 2004; Shen, 2009).

### [2.2 Vocabulary Size And Reading Comprehension](#)

Although there are many dimensions to vocabulary knowledge, Qian (1999) mentioned two primary dimensions of vocabulary knowledge, namely depth and size, as important in relation to a learner's reading comprehension. Although Qian (1999, 2002) advocated that vocabulary depth was as important a predictor of

reading comprehension performance as vocabulary size, Stæhr (2009) found vocabulary size to be an instrumental factor for reading success in L2 and Stæhr (2008) found that the vocabulary size of learners strongly affected the reading performance of learners, especially low-level EFL learners. Furthermore, Moinzadeh and Moslehpour (2012) showed that vocabulary size was more indicative of learners' reading comprehension performance than vocabulary depth. Several other studies also showed that learners' vocabulary size correlated positively and significantly to their reading comprehension (Kameli & Baki, 2013; Moinzadeh & Moslehpour, 2012; Mehrpour et al., 2011). Therefore, in the context of this study, the research focused on students' vocabulary size and its relation to students' academic reading comprehension performance.

Vocabulary size in studies of second and foreign language acquisition is presently determined very often through the counting of words as word families as such techniques are thought to give reliable and meaningful results (Milton & Treffers-Daller, 2013). A word family consists of a base word and all its derived and inflected forms that can be understood by a learner without having to learn each form of the word separately (Bauer & Nation, 1993). For example, *cook*, *cooks*, *cooked* and *cooking* would belong to the same word family.

Nation (2006) suggested that learners need to know 8000-9000 word families in order to understand written text. Laufer & Ravenhorst-Kalovski (2010) suggested that there should be two thresholds in determining the vocabulary size needed for adequate comprehension. They suggested an optimal knowledge of 8000 word families for reading comprehension and a minimal knowledge of 4000-5000 word families for 'adequate' comprehension. The latter would seem more attainable and less daunting for learners who are less proficient. The measurement for 'adequate', however, is not one that is agreed upon universally, and what is deemed 'adequate' in one situation may not be 'adequate' in another. Laufer & Ravenhorst-Kalovski (2010) considered 'adequate' to achieving a score of between 75%-88% in the reading comprehension. This meant that learners were able to read with some guidance and eventually independently after attending classes for

one semester. It should be noted that Laufer & Ravenhorst-Kalovski (2010) used academic text in their study while Nation (2006) looked at novels and newspapers. Nonetheless, the vocabulary size required, at optimal level, appeared to be similar despite the different text types.

Güngör & Yayli (2016) estimated that the vocabulary size required for comprehension of academic texts was about 8000 word families, which concurred with the previous studies. Güngör & Yayli (2016) also indicated a relatively linear relationship between vocabulary size and reading comprehension.

In the Malaysian context, recent studies on the relationship between vocabulary size and reading comprehension among tertiary students have been limited. Yunus, Mohamad, & Waelateh (2016) compared the vocabulary size of Malaysian and Thai tertiary students and found that the vocabulary size for the majority of the Malaysian students ranged from 4000 to 6000 word families while their Thai counterparts scored in the range of 2000 to 4000 word families. However, they did not examine the vocabulary size in relation to any of the language skills. Tan & Goh (2017) looked at the relationship between vocabulary size and listening comprehension among Malaysian tertiary learners. They found that the vocabulary size of Malaysian tertiary learners mostly ranged between 4000 and 7000 word families, which is consistent with the findings in Yunus et al. (2016). Ibrahim et al. (2016) investigated the vocabulary size and reading comprehension of tertiary students, and found that all the students were able to achieve the minimum required score in the reading comprehension (equivalent to IELTS Band 6 or TOEFL 550) although majority of the students only had a mastery of about 3000 word families on the vocabulary test. The vocabulary size of Malaysian tertiary students found in this study appeared to be inconsistent with the results by Yunus et al. (2016) and Tan & Goh (2017), and seemed to suggest that a lower vocabulary size might be sufficient for reading comprehension at tertiary level. However, the reading test used was an institutionalised English test and the type of text in the test was unclear. The study also showed a positive correlation between vocabulary size and reading comprehension.



Previous studies on vocabulary size and reading comprehension identified the vocabulary size required for reading comprehension, and in some instances either for 'adequate' or 'optimum' comprehension. However, none of the studies discussed the relationship between vocabulary size and the different levels of comprehension. The current study aimed to look at student's vocabulary size and its relationship with reading comprehension of academic texts, particularly the level of reading comprehension achieved in a Malaysian context.

### **3. Methodology**

This study used a quantitative approach to investigate the relationship between vocabulary size and reading comprehension of academic text.

#### ***3.1 Participants of the Study***

The participants of this study were second year Diploma in Mass Communication students at a private University College in Malaysia where English is the medium of instruction. Details of the participants are given in Table 2.

*Table 1: Participants of the Study*

Total	Male	Female
53	12	41

The Vocabulary Size Test (VST) was used to determine the students' vocabulary size and the IELTS reading test (Academic Module) was administered to obtain the students' reading comprehension scores. The data was analysed using descriptive statistics.

#### ***3.2 Vocabulary Size Test***

The Vocabulary Size Test (VST) for 14000 words by I. S. P. Nation & Beglar (2007) is a non-diagnostic test designed as 'a proficiency measure used to determine how much vocabulary learners know' (p.10). It tests students' knowledge of the 14000 most frequent word families of English. The test is in a multiple choice format. There are 10 items tested for each of the 1000 frequent word families. The test words are presented in a simple non-defining context and there are four answer choices for each question. Each correct answer was given one mark. There was no mark deduction for wrong answers or unanswered questions. The vocabulary size was determined by multiplying the total VST score by 100. The VST is freely available online at [www.lexutor.ca](http://www.lexutor.ca). A sample of the VST question is given in the appendix.

#### ***3.3 IELTS Reading Test***

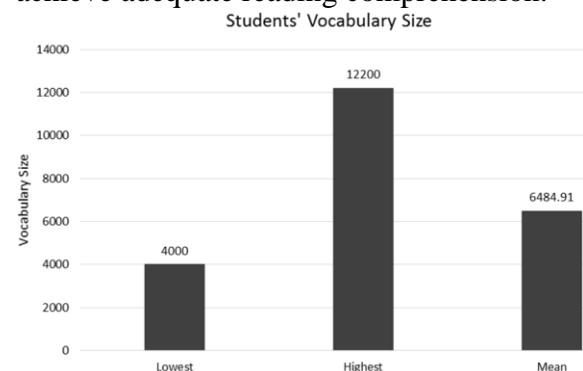
The IELTS Reading Test (Academic Module) was used to measure the students' reading comprehension. The IELTS Reading Test consists of three passages with a total of forty questions. There is a variety of question types in the test such as multiple choices, short answers (one- to three-word answers), true/false/not given, and matching. Students were given one hour to complete the test. One mark was awarded for each correct answer and there was no penalty for wrong answers or unanswered questions. The IELTS Reading Test used for this study was taken from Cambridge IELTS 9: Authentic Examination Papers from Cambridge ESOL. In the context of this study, students were considered to have achieved adequate reading comprehension if they scored 57.5% in the test. This figure is based on the score required for a band 6 in the IELTS Reading Test ([www.ielts.org](http://www.ielts.org)). Test-takers who obtain Band 6 in the IELTS are considered 'competent users' of English.

### **4. Findings and Discussion**

The results for this study are presented according to the research questions for this study. The results are reported descriptively.

#### ***4.1 The Vocabulary Size of Second Year Diploma Students Studying Mass Communication***

The mean vocabulary size of the students in this study was 6484.91. The smallest vocabulary size among the students was 4000 word families and the largest vocabulary size was 12200 word families. Figure 1 shows the vocabulary size of the students. Based on the vocabulary size suggested by previous research for reading comprehension, all the students in this study would be expected to achieve adequate reading comprehension.



*Figure 1: Students' Vocabulary Size*

The next section will discuss the students' performance in reading comprehension.

### 4.2 The Reading Comprehension Proficiency of Second Year Diploma Students Studying Mass Communication

Figure 2 shows the overall reading comprehension performance of the students. The minimum score obtained by the students was 27.5% while the highest score was 90%. The mean score of 49.67% was lower than the 57.5% benchmark for adequate comprehension in this study.

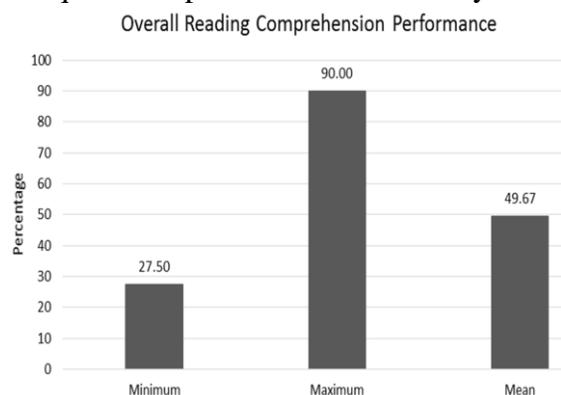


Figure 2: Students' Reading Comprehension Performance

Figure 3 shows the students' reading comprehension performance according to their proficiency levels. The proficiency levels were categorised based on the IELTS band descriptors ([www.ielts.org](http://www.ielts.org)). Students who scored below 37.5% were categorised under limited proficiency while those who scored between 37.5% and 57% were considered to have modest proficiency. To achieve proficient level, students have to score between 75% and 87%. A score of 87.5% and above meant the student had very proficient level of reading comprehension. The findings of this study showed that the majority of students (52.83%) only achieved modest reading comprehension. There were equal numbers of students who achieved adequate reading comprehension and those who had limited comprehension (10 students or 18.87% each). Only four students (7.55%) and one student (1.89%) achieved proficient and very proficient levels respectively.

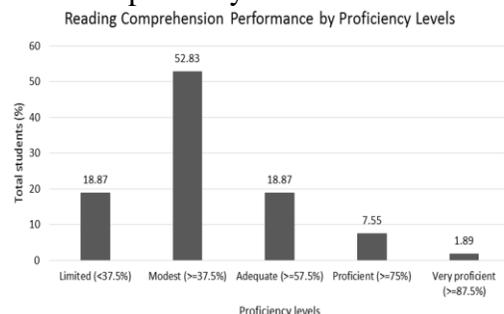


Figure 3: Students' Reading Comprehension Performance by Proficiency Levels

The next section discusses the relationship between the students'

vocabulary size and their reading comprehension performance.

### 4.3 The Vocabulary Size Required for Different Levels of Reading Comprehension Proficiency

Based on the discussion on vocabulary size and reading comprehension in the previous sections, it appears that the students did not achieve adequate reading comprehension even though their vocabulary size was deemed to be sufficient for the task.

Table 2: Relationship between Reading Comprehension and Vocabulary Size According To Proficiency Levels

Reading comprehension proficiency	Total students (%)	Min vocabulary size	Max vocabulary size	Mean vocabulary size
Limited (<37.5%)	18.87	4400	7800	4490
Modest (≥37.5%)	52.83	4000	10200	5871.43
Adequate (≥57.5%)	18.87	4900	11200	8110
Proficient (≥75%)	7.55	6100	12200	10275
Very proficient (≥87.5%)	1.89	10200	10200	10200

Table 2 shows the minimum, maximum and mean vocabulary sizes obtained by the students for each proficiency level. The data in this study showed that the mean vocabulary size required for adequate reading comprehension was about 8000 word families, which is the vocabulary size for reading comprehension proposed by Nation (2016) and the vocabulary size for optimal comprehension proposed by Laufer & Ravenhorst-Kalovski (2010). The proposed vocabulary size for adequate reading comprehension of 4000-5000 word families by Laufer & Ravenhorst-Kalovski (2010) does not seem to be sufficient for adequate reading comprehension among the students in this study. In fact, students with that vocabulary size could only manage limited reading comprehension and students needed a mean vocabulary size of close to 6000 word families to achieve modest reading comprehension. Thus the vocabulary size proposed by Laufer & Ravenhorst-Kalovski (2010) for adequate reading comprehension appears to be insufficient. Furthermore, the vocabulary size of 8000 word families only enabled students to achieve adequate reading comprehension. For proficient reading comprehension, students needed an average of about 10000 word families.

Figure 4 shows the relationship between vocabulary size and reading comprehension for the individual students in this study. To aid comparison, the vocabulary size was converted to percentage based on the maximum size of

14000 since the VST is the 14000 version. The results of this study did not show evidence of a linear relationship between vocabulary size and reading comprehension, unlike Güngör & Yayli (2016) who found a relatively linear relationship in their study. In fact, the student with the smallest vocabulary size did not obtain the lowest reading comprehension score; neither did the student with the largest vocabulary size obtain the highest reading comprehension score. The student with the smallest vocabulary size (4000 word families) had a modest reading comprehension score of 37.5% while the student with the largest vocabulary size (12200 word families) scored in the proficient level category with 87.14%. This study also did not find a threshold vocabulary size for students to achieve adequate reading comprehension as there were students who could only achieve modest reading comprehension (score below 57.5%) even though their vocabulary sizes exceeded 8000 word families.

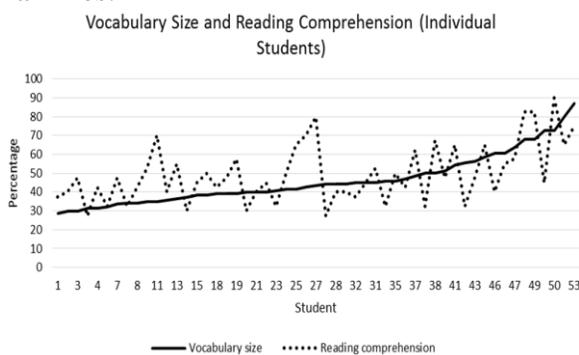


Figure 4: Relationship between Vocabulary Size and Reading Comprehension (Individual Students)

## 5. Conclusion

This study found that the average vocabulary size of students in a tertiary institution in Malaysia was over 6000 word families. A majority of the students could not achieve adequate reading comprehension in the IELTS Reading Test (Academic Module) with their average score of only 49.67% compared to 57.5% for adequate reading comprehension. The average vocabulary size needed by the students for adequate reading comprehension was about 8000 word families, which was the vocabulary size posited by Nation (2006) and Laufer & Ravenhorst-Kalovski (2010) for optimal reading comprehension. The finding is inconsistent with Laufer & Ravenhorst-Kalovski (2010)'s suggestion that a lower vocabulary size of 4000-5000 word families would suffice for adequate

reading comprehension. The findings of this study also seemed to suggest that achieving proficient reading comprehension required a larger vocabulary size of about 10000 word families. From the perspective of individual student's performance, there was no linear relationship between the students' vocabulary size and their reading comprehension performance. This study also did not find any threshold vocabulary size for students to achieve adequate reading comprehension.

The findings in this study are limited to one tertiary institution and students from one course of study. As such, caution must be observed in making any generalisation from the results of this study. It is recommended that more research be done to revisit the relationship between vocabulary size and reading comprehension in other tertiary institutions and among students studying different courses.

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#### Appendix: Sample of Questions in the Vocabulary Size Test

Circle the letter a-d with the closest meaning to the key word in the question.

First 1000

3. PERIOD: It was a difficult period.
- question
  - time
  - thing to do
  - book

Second 1000

1. MAINTAIN: Can they maintain it?
- keep it as it is
  - make it larger
  - get a better one than it
  - get it