



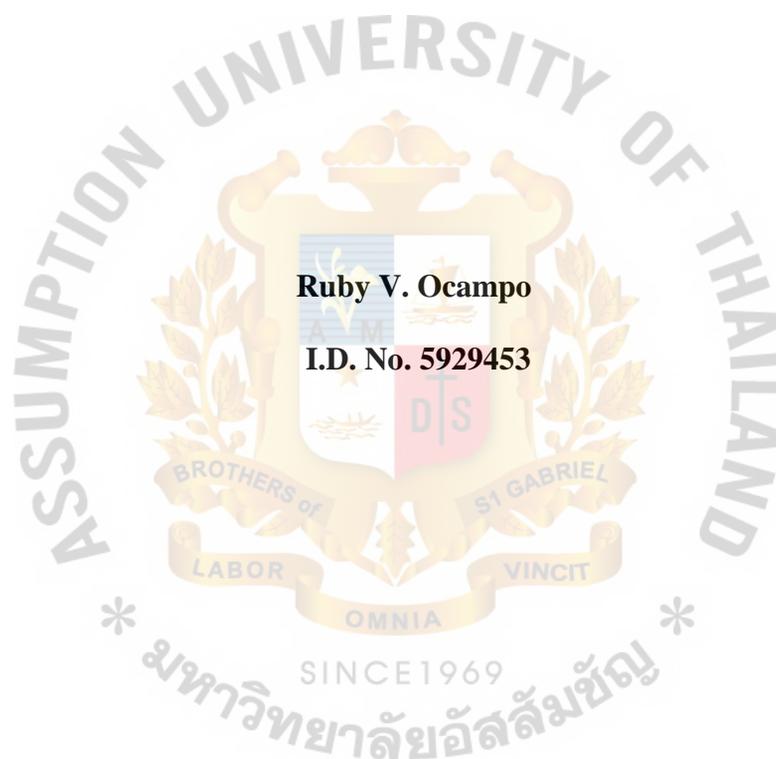
THE RELATIONSHIP BETWEEN VOCABULARY SIZE
AND READING COMPREHENSION PERFORMANCE
OF 12TH GRADE THAI EFL LEARNERS

Ruby V. Ocampo

A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF ARTS
in English Language Teaching
Graduate School of Human Sciences
ASSUMPTION UNIVERSITY OF THAILAND

2018

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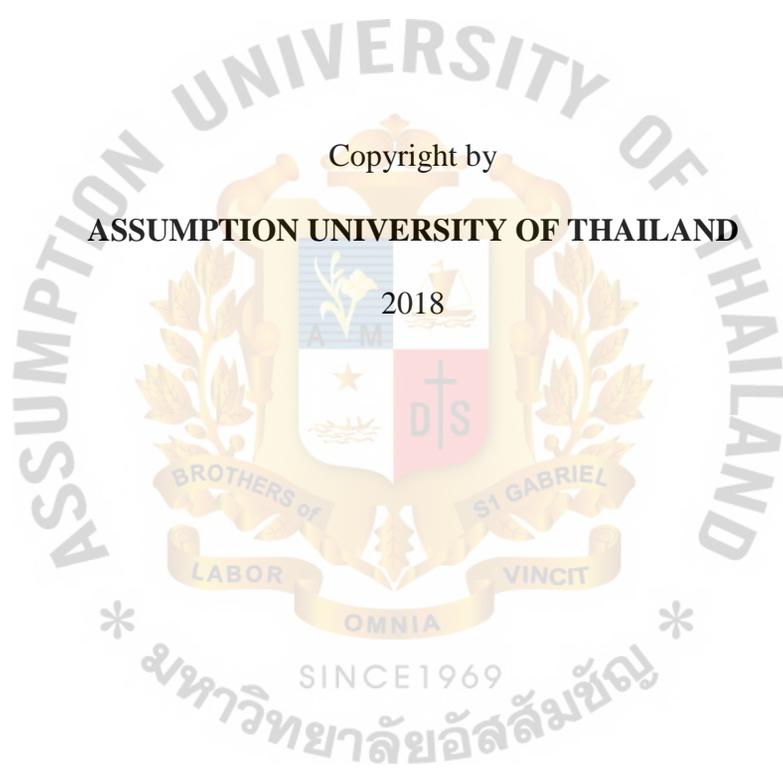


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2018



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Thesis Title: THE RELATIONSHIP BETWEEN VOCABULARY SIZE AND READING COMPREHENSION PERFORMANCE OF 12TH GRADE THAI EFL LEARNERS

By: RUBY V. OCAMPO

Field of Study: MASTER OF ARTS IN ENGLISH LANGUAGE TEACHING

Thesis Advisor: DR. ARTHUR MCNEILL

**Accepted by the Graduate School of Human Sciences, Assumption University in
Partial Fulfillment of the Requirements for the Master Degree in English Language
Teaching**

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ABSTRACT

I.D. No.: 5929453

Key Words: ADEQUATE COMPREHENSION, READING SKILLS, RETRIEVING INFORMATION, INTERPRETING TEXTS, REFLECTING AND EVALUATING, READING LITERACY, VOCABULARY SIZE

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Foreign language learning (L2) reading research has produced overwhelming evidence that vocabulary size is a good predictor of reading performance. However, conceptions of reading literacy are still evolving. For example, the Program for International Student Assessment (PISA) regards reading as a problem-solving activity and includes texts of different genres in its reading tests. This thesis reports a study that required Thai secondary school students (N=140) to take four parts of the PISA reading test and a test of English vocabulary size (Nation, 1990). The reading comprehension and vocabulary size scores were correlated to establish whether vocabulary size was related to reading comprehension overall, as measured by the PISA tests of reading literacy. Significant positive correlations were found between overall reading comprehension and vocabulary size, measured at 2000K ($r=.750$, $n=140$, $p<0.01$), 3000K ($r=.680$, $n=140$, $p<0.01$), 5000K ($r=.624$, $n=140$, $p<0.01$) and Academic Wordlist (AWL) ($r=.672$, $n=140$, $p<0.01$) levels. A follow-up analysis calculated the correlations between vocabulary size and particular PISA reading skills: (a) retrieving information, (b) interpreting texts, and (c) reflecting and evaluating in order to establish whether vocabulary size was also closely related to different

types of reading skills. The results confirmed that significant positive correlations exist between vocabulary size and all three groups of reading skills assessed by PISA. The research concludes that vocabulary size appears to have a strong positive relationship not only with reading comprehension overall, but also a range of individual reading skills.



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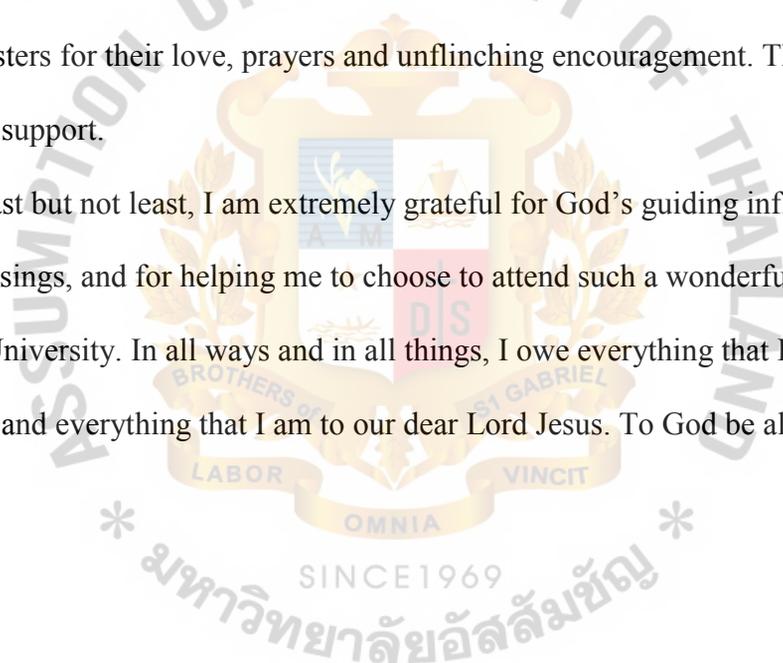
I am also very grateful to a wonderful thesis committee: Assoc. Prof. Dr. Suwattana Eamoraphan, Asst. Prof. Dr. Kulaporn Hiranburana, and Dr. Pramarn Subphadoongchone. They have graciously advised me and suggested what to include in my literature review. I would also like to thank all my professors in ABAC from the first day until the final day of my coursework with them; I gained so much knowledge and insights from them. To name a few: Dr. Linchong Chorrojprasert, Dr. Ratchaporn Rattanaphumma, Dr. Rosukhon Swatevacharkul, Dr. Marilyn Fernandez Deocampo, Dr. Soisithorn Isarankura Na Ayutthaya.

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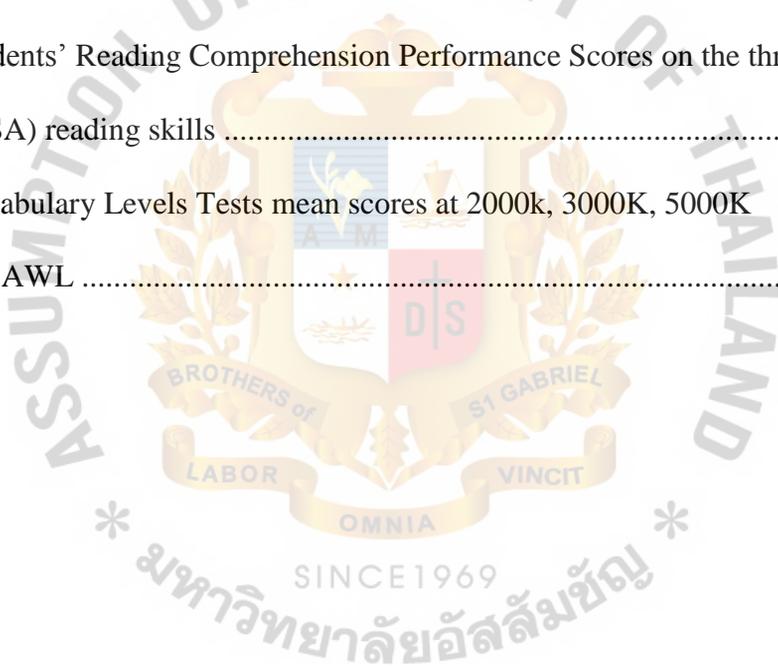
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CHAPTER I

INTRODUCTION

This chapter presented the background of the study, statement of the problem, research questions, research objectives, research hypothesis, theoretical framework, conceptual framework, scope of the study, definition of terms and the significance of the study.

1.1 Background of the Study

English is a significant world language, especially in the era of globalization. It has become the universal language that is used in the world of education, science and technology, business, trade, and international relations. It is clear that English language has become more predominant all over the world. It makes sense that providing essential linguistic knowledge and skills for students is one of the greatest goals of a teacher. One way to attaining this goal is to develop each student's literacy. As reading plays an inherently important part throughout the process of acquiring a language, particularly in second and foreign language (L2) learning, all children should increase their comprehension of what is read aloud to them or what they read individually. Students develop L2 comprehension at varying rates and need differing amounts of guidance to support their increase in comprehension. Some students need little or no help in comprehension while others struggle to attend to a text long enough to accurately restate what they have heard or read. As students prepare for their future roles in life, educators need to ensure that cognitive and metacognitive reading skills are unambiguously taught to their students (Rowe, 2005).

Numerous factors influence the ability of an individual to effectively read, for instance, an important factor is the development and acquisition of vocabulary when learning

a foreign language (Nation, 2001). Vocabulary size is one substantial factor that can affect reading comprehension. As such, it is critical that teachers' of foreign languages are able to contribute sufficiently to the students' list of vocabulary, so that they are able to effectively comprehend a wide variety of texts, such as scholarly papers, to an appropriate level.

However, Hu and Nation (2000) stated that it is both complicated and complex when trying to read well when referring to the size of one's ability to recall vocabulary (that is, students' reading comprehension). As such, knowing a wide range of vocabulary is a critical component to experience greater fulfillment with reading comprehension, in addition to the need to have a sufficient level of background knowledge regarding English grammar.

Moreover, Laufer and Sim (1985) stated that there were three aspects necessary to acquiring a foreign language. In particular, they noted the need to have a sufficient level of vocabulary, an ability to understand syntactic structures as well as knowledge about the particular subject-matter. Nation and Newton (1997) found that in order to develop the students' level of language ability, it was essential to grasp a wide range of vocabulary. For instance, learners of English as a Foreign Language (EFL) will greatly improve their understanding of a context if their capacity to engage more with vocabulary improves (Leki & Carson, 1994). Thus, vocabulary enhances the learners' opportunities to develop their academic potential in school since it refers to knowledge acquisition. In fact, Curtis (1987) claimed that the ability of learners to grasp new knowledge might be influenced by an insufficient range of vocabulary. As a result, it was essential to realize what is needed for a student to comprehend ideas or concepts when reading about issues that stem from the nature of academia. Research completed by Hu and Nation (2000) and similarly repeated by Schmitt (2000) found that a determining factor of students' reading comprehension was influenced by the familiarity of words, as such, it could be said that the more unfamiliar a word might be within a reading passage; the more challenging it was to grasp the necessary components to

engage in fruitful knowledge transfer. As such, the “foremost indicator of a text’s difficulty” (Stahl, 2003, p. 241) is challenging since it is inter-twined by both vocabulary and reading comprehension. Despite this, previous research has enhanced the relationship between both vocabulary knowledge as well as reading comprehension, with the hope of achieving the required vocabulary knowledge in order to understand context-based reading and engage in improved comprehension by the learner.

Reading and vocabulary is an important talking point for many scholars within the foreign language industry since it is commonly understood that the respective two are clearly linked together; that is, the success of reading comprehension is widely accepted to be related to the ability of the learner to grasp a sufficient range of vocabulary. To support this, studies by Anderson and Freebody (1981) found that the more vocabulary a learner is able to recall the higher the ability to understand a reading passage. This is further supported and developed further by Nagy (1988), who similarly stated that in order to comprehend a range of texts, it was important that the learner has sufficient vocabulary, but Nagy went further by noting that the teaching of vocabulary should be a critical aspect of language education. While there are agreements about the role of vocabulary when measuring reading performance, research varies when it comes to both the extent of, and the manner in which, vocabulary instruction should be undertaken. Despite this, advocates have supported the idea that vocabulary learning should only be undertaken within a classroom setting, and other scholars have noted a wide ranging different methods that are proposed for learners of vocabulary.

However, in spite of the strong interest that has been shown when investigating the relationship between vocabulary size and reading comprehension in general, there had been, to the knowledge of this researcher, no previous studies that examined the relationship between vocabulary size and specific reading skills. This study sought to fill this gap by

examining how reading skill groups, for example, (a) *retrieving information*, (b) *interpreting texts*, and (c) *reflecting and evaluating* relate to vocabulary size in the reading literacy test of the *Program for International Student Assessment (PISA)*.

1.2 Statement of the Problem

Both English as a Second Language (ESL) and English as a Foreign Language learning (EFL), attribute vocabulary as significant in each of the four English language skills, namely, listening, reading, writing and speaking (Nation, 2011). In such countries like Thailand, English is considered a foreign language. It is a requirement that Thai students register for English as a compulsory subject, indeed, the national curriculum considers English as one of the essential subjects. English language learning as a foreign language in Thailand begins at primary level, with Thai students often continuing with high school and tertiary studies. Despite this, throughout their formal education, students in Thailand consistently experience challenges in each of the four language skills. Furthermore, sub-skills that include grammar, pronunciation, and vocabulary are commonly considered to be challenging areas for them. In particular, Thai students have an insufficient level of sentence structures when referring to reading texts, as well as vocabulary, which leads to a deficiency in these core areas that ultimately impact their level of reading comprehension. In short, the implication on their reading comprehension is their inability to grasp the context of a reading passage which leads to insufficient understanding. This is a major issue because, as numerous studies have consistently shown, Thai students experience a lack of vocabulary (Chawwang, 2008; Jamtawee, 2000; Supatranont, 2005).

To support this, studies conducted by Chandavimon (1998) found that communication is the purpose for which English is a subject within the Thai national curriculum. In order to communicate with each other in a meaningful manner, students are required to grasp the four key language skills respectively mentioned. Nation and Newton

(1997) stated that the utilization of a language begins with the ability to grasp a wide range of vocabulary, although for most, reading is a language skill which is commonly emphasized within both formal (schools) and informal learning (extracurricular) environments; Carrell (1989) and Grabe and Stoller (2002) found that the acquisition of vocabulary is a key point for effective second language learning (Nation, 2001).

To support this, it is perhaps easily understood that the need to be well-versed with reading is important for learners to pass their high school examinations so they might enter university (Chandavimon, 1998). For instance, O-NET (which is the university entrance examination that tests a 12th grade students' level of English). As a result, the need to be able to effectively comprehend reading passages is especially critical for Thai high school students.

Research results from international studies, in particular, the *Programme for International Students Assessment or PISA* (2015) suggested that approximately twenty percent of learners in *Organisation for Economic Co-operation and Development (OECD)* countries, which includes Thailand, on average, have not sufficiently achieved a basic level of reading proficiency. Indeed, studies have revealed that Thai students' English reading ability are not high, as such, one of the aims of this study is to identify whether inadequate vocabulary knowledge might account for Thai students' relatively poor performance on international measures of reading. In order to understand PISA, a short overview of this, is necessary.

An extract from PISA (2015) explained their approach to reading literacy as based on a concept of 'human capital' defined by the OECD (2003, p.14-15) as

“the capacity to understand, use and reflect on written texts, in order to attain one's goals, to develop one's own knowledge and potential, and to participate in society” (p.15). *Reading proficiency of the candidates is measured in relation to*

processes, contents, and contexts of application (similar to the ‘domains of language use’ of the CEFR), with the following sub- categories used to set the test tasks:

Processes (aspects of reading literacy)

- *Forming a broad understanding;*
- *Retrieving information;*
- *Developing an interpretation;*
- *Reflecting on content of text;*
- *Reflecting on form of text;*

Content (knowledge and understanding)

- *Continuous texts (narrative, expository, descriptive, argumentative/persuasive, injunctive/instructive);*
- *Non- continuous texts (charts, graphs, diagrams, maps, forms, advertisements).*

Context of application (situations)

- *Personal*
- *Educational*
- *Occupational*
- *Public”*

OECD (2003, p. 16)

By way of illustration of how reading competence is represented in CEFR, Table 1 reproduces the band descriptors for L2 reading which equate to the six CEFR levels (ranging from A1 to C2), across CEFR’s three general levels (Basic User, Independent User and Proficient User). Table 1 also indicates the extent to which the CEFR levels are expected to apply to the population of the present research, which is estimated to correspond to the first three CEFR levels only.

Table 1. Overall reading descriptors of Common European Framework of Reference for Languages (CEFR, 2011)

Label	CEFR Level	CEFR Overall Reading	Applicable to present study of 12 th grade Thai EFL learners
Proficient User	C2	Able to practically understand all forms of written language including abstract ideas, structurally complex or highly colloquial literary and non - literary writings which can be understood and interpreted critically. Can comprehend a wide variety of extended and complex texts, while also capable of recognizing subtle distinctions of written sentence styles of both implicit and explicit meaning.	No
	C1	Capable of understanding complex written passages that relate to his/her own area of specialty, provided he/she can re-read challenging passages over again.	No
Independent User	B2	Able to without assistance from another person, while managing to adapt to the needs of the reading passage regarding text style and purpose. The user is able to reference sources appropriately, while actively using a variety of different word choices despite experiencing some difficulty with idioms.	No
	B1	Capable of reading passages by grasping the literal meaning of the text when related to the reader's own background or specialty. Some inferential comprehension is possible.	Yes
Basic User	A2	Very little inferential meaning is interpreted from the reading passage, while short reading passages are understood only when the topic is familiar to the reader. English words that are shared internationally, or words that are high frequency vocabulary words may be understood comfortably.	Yes
	A1	Literal understanding of reading passages is interpreted appropriately in simple and short texts, while familiar words and basic phrases can also be identified, although, the reader is likely to re-read the passage again when necessary.	Yes

Although the literature examined on the relationship between vocabulary size and reading comprehension is extensive and conclusive, it has to be recognized that none of the selected studies were conducted in Thailand. The assumption that local Thai students may know 3,000 English words or more needs to be tested and confirmed if meaningful comparisons are to be made between the present study and those reported in the literature, where it is believed that a vocabulary of 3,000 words is needed to support a good performance in reading comprehension. This study examined the relationship between vocabulary size and reading comprehension ability of 12th grade students at Pramandanijanukroah School in Bangkok.

1.3 Research Questions

1. How well do Thai upper secondary students perform in a standard PISA English reading comprehension test?
2. How many English words do Thai upper secondary students know?
3. Is there a significant correlation between the vocabulary size and reading comprehension performance of 12th grade Thai EFL learners?
4. How does vocabulary size relate to the following reading comprehension skills:
 - 4.1. retrieving information?
 - 4.2. interpreting texts?
 - 4.3. reflecting and evaluating?

1.4 Research Objectives

1. To identify the reading comprehension performance of 12th grade Thai EFL students.
2. To determine the vocabulary size of 12th grade Thai EFL students.
3. To examine if there is any significant correlation between vocabulary size and reading comprehension performance of 12th grade students at a secondary school in Bangkok.

4. To determine whether students' vocabulary size relates to the following reading skills: 1) retrieving information, 2) interpreting texts and 3) reflecting and evaluating.

1.5 Research Hypothesis

There is a significant positive correlation ($p < .05$) between the vocabulary size and reading comprehension performance of 12th grade Thai EFL students.

1.6 Theoretical Framework

This study was aligned with lexical threshold, lexical coverage and vocabulary size in relation to reading comprehension, bearing the research hypothesis in mind. While the meaning of *independence* is well understood, research has agreed that sufficient comprehension refers to the unassisted understanding of either spoken communication or written passages (Nation, 2006). Nation (2006) found that for sufficient understanding to occur, it was necessary to understand at least 98 percent of a passage, and as such, the need to comprehend the meaning of 8,000-9,000 words is needed for written texts. On the other hand, a range of 6,000-7,000 words is necessary for spoken texts. Despite this, Laufer and Ravenhorst-Kalovski (2010) argued that a broadening of reading comprehension was required which led to them proposing both the optimal threshold as well as the minimal threshold, with 98 percent comprehension (8,000-9,000 words) and 95 percent (5,000 words) respectively. Further studies by Adolphs and Schmitt (2003) pointed out that comprehending around 3,000 word families is necessary to converse in English, while Nation (2006) also seemed to support this finding from his own research as well. Apart from this, the ability to listen and understand effectively required less comprehension when compared to, say, speaking (Nation 2006; Stæhr 2008)

Laufer (1989/1992), in her investigations of the relationship between reading and L2 vocabulary size, empathized the need to have a large range of vocabulary (roughly 95

percent) despite applying similar principles to second language learning. She referred to comparing the transfer of skills between L1 and L2 learners as having an inadequate ability to comprehend the text. The design of the present research reflects the assumed theoretical relationship between L2 vocabulary size and reading comprehension, as respectively discussed. Figure 1 illustrates the relationship with reference to Nation's (2006) data.

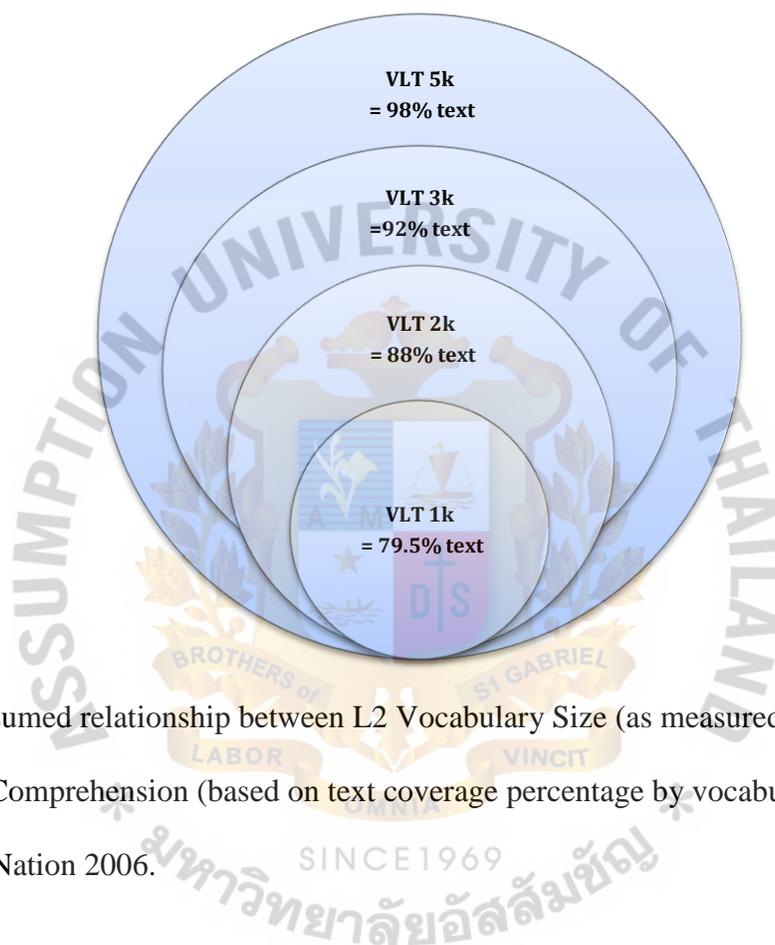


Figure 1. Assumed relationship between L2 Vocabulary Size (as measured by VLT scores) and Reading Comprehension (based on text coverage percentage by vocabulary size). Based on data from Nation 2006.

Key:

1k = Knowledge of the 1000 most frequent word families

2k = Knowledge of the 2000 most frequent word families

3k = Knowledge of the 3000 most frequent word families

5k = Knowledge of the 5000 most frequent word families

79.5% = Coverage of 79.5% of the tokens of a written text

88% = Coverage of 88% of the tokens of a written text

92% = Coverage of 92% of the tokens of a written text

98% = Coverage of 98% of the tokens of a written text

1.7 Conceptual Framework

The purpose of the study was to examine the relationship between vocabulary size and reading comprehension performance of 12th grade Thai EFL learners in Bangkok. Thus, the conceptual framework devised for this study is shown in Figure 2.

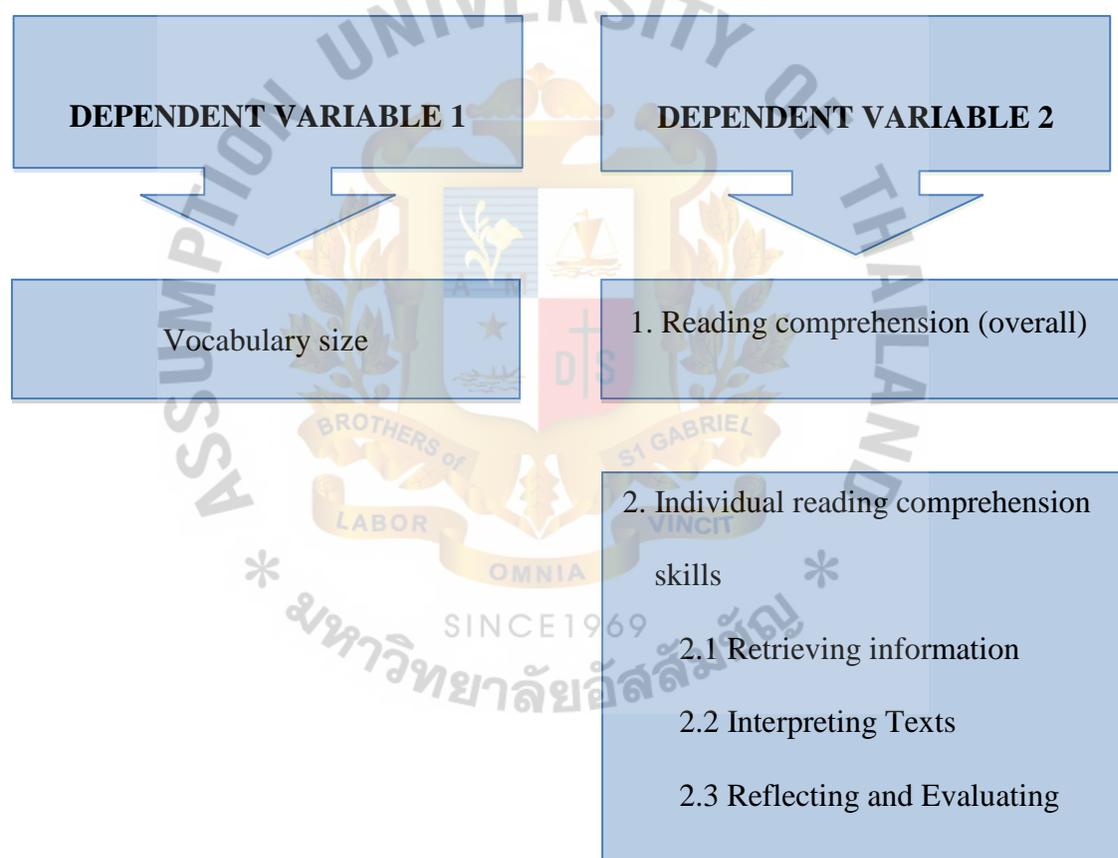


Figure 2. Conceptual framework of the study

1.8 Scope of the Study

1. This research project was carried out with 140 subjects, all of whom were upper secondary English learners. The study focused exclusively on vocabulary size and reading comprehension performance.

2. The study included only one measure of the subjects' vocabulary size, Nation's (1990) Vocabulary Levels Test (VLT). There was no assessment of the subjects' wider vocabulary knowledge (e.g. collocation, pronunciation, spelling, etc.).
3. The vocabulary test measured only written receptive vocabulary knowledge, as required for L2 reading. Because of this, a test-taker's score provided little indication of how well these words could be used in speaking and writing.

1.9 Definitions of Terms

1. Adequate comprehension is defined as *full comprehension* or *unassisted comprehension*, e.g. the learner does not require outside support to understand the text (Nation, 2006).

2. Reading comprehension refers to the reader's ability/performance to draw meaning from a text and interpret the information it contains as assessed by the PISA test.

3. Reading literacy refers to an individual's capacity to understand, use, reflect on and engage with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society as defined by PISA.

4. Reading skills refers to three reading processes as defined by PISA:

4.1 Retrieving information refers to student's ability to locate one or more pieces of information in a text measured by six questions with a total score of 11.

4.2 Interpreting texts refers to student's ability to identify the main idea in a text, constructing meaning and drawing inferences from one or more parts of a text measured by eight questions with a total score of 13.

4.3 Reflecting and evaluating refers to student's ability to make a comparison or connections between the text and background knowledge, or explain a feature of the text by drawing on personal experience and attitudes measured by four questions with a total score of 6.

5. Vocabulary size refers to the number of English words a learner can recognize and give the correct meaning of. *Words* refers to word families, as defined by Nation (2001, p. 8): “a headword, its inflected forms, and its closely related derived forms”. This includes affixes such as *-ly*, *un-* and *-ness* measured by 30 items of each Vocabulary Level Tests (2000K, 3000K, 5000K) and Academic Word List (AWL).

5.1. Receptive vocabulary knowledge is defined as knowledge of words or lexical units that the language learners recognize and understand the meaning from listening and reading, but cannot use the words productively in communication (Nation, 2001).

5.2. Productive vocabulary knowledge refers to use of a target word from the language learners’ memories in speaking and writing (Read, 2000).

5.3. Breadth of vocabulary knowledge is defined as the number of words that a person knows.

5.4. Depth of vocabulary knowledge is defined as a learner’s level knowledge of various aspects of a given word, or how well the learner knows this word.

6. Thai EFL learners refers to 12th grade male and female students whose age range was 17 - 18 years at Pramandanijanukroah School, Bangkok in the academic year 2018 semester 1.

1.10 Significance of the Study

The findings obtained will provide information about the 12th grade students at Pramandanijanukroah School on their reading performance overall and in relation to particular reading skills (e.g. retrieving information, interpreting texts, reflecting and evaluating). The results are expected to identify a vocabulary size threshold that is required to read English texts with adequate comprehension. Reading comprehension is adequate when a reader uses his ability to translate words into meanings, to secure a clear grasp and understanding of the ideas presented, and to sense clearly the moods and feelings intended in the text. To add to this, the research findings might be used to guide teachers in Thailand to

integrate instructional techniques within the classroom to develop the academic achievement scores of learners. As a result, this research might empower Thai teachers to engage more with their students by way of developing learners' reading and vocabulary skills.



CHAPTER II

REVIEW OF RELATED LITERATURE

This research was conducted to examine the relationship between vocabulary size and reading comprehension performance of 12th grade Thai EFL learners. It was also designed to ensure the provision of descriptive information about each variable as it pertains to grade 12 EFL learners in Thailand. The first section of the literature reviews prominent reading models, such as the bottom-up, top-down, and interactive models. The second section reviews the role of vocabulary in ESL/EFL reading. Finally, the third section reviews the L2 linguistic threshold, Lexical Inferencing, and Teaching and Learning Strategies.

2. 1. L2 Reading Models

There are a number of varying ideas that refer to the nature and the process of reading which resulted in the development of L2 reading models over the course of the last forty years. In fact, “a reading model is theory of what is going on in the reader’s eyes and mind during reading and comprehending (or miscomprehending) a text” (Davies, 1995, p. 59). These models were developed in order to provide an explanation and prediction of learner reading behavior. Furthermore, the literature has shown that this is the basis of instructional reading. To support this, the development of most theoretical assumptions were based on these models. In this literature review, the main principles of these models and how they relate to vocabulary knowledge and reading strategies were discussed.

Apparently, in the last four decades, reading researchers have been exploring the process of reading. In fact, in an attempt to explain how a learner recognizes a word, researchers have looked to identify how a clause is processed and how a learner comprehends a

passage, which has led to the development of appropriate models specifically for reading (Singer & Ruddell, 1985). Such well-known models like the bottom-up model (Gough, 1972), the top-down model (Goodman, 1967; Smith, 1971), and the interactive model (Rumelhart, 1977, 1980; Stanovich, 1980; Carrell, 1983a, 1983b) are discussed in this literature.

Goodman (1968) has referred to the reading process as a psycholinguistic guessing game, where the reader is likely to use her overall understanding of the world in order to predict what might come in the following parts of the text (Barnett, 1989). According to the research, such respective models might be classified into the following groups:

1. Top-down
2. Bottom –up
3. Interactive

These reading models are prominently used in second or foreign language (SL/FL) reading, rather than in first language (L1) reading (Barnett, 1989).

2. 1. 1. The Top-down Model

The top-down model states that the ability to comprehend text begins first with the mind of the reader since personal ideas and previous knowledge or understanding plays a significant role when grasping meaning behind the passage. Further studies by Goodman (1967) introduced the top-down model of reading, in which reading was viewed as a psycholinguistic guessing game. Another notable person who advocates the top-down model is Smith (1971). This model is a concept driven model where the readers' background knowledge and expectations lead them in their reconstruction of the meaning of the text. The readers begin with having certain presumptions about the text derived from background knowledge. They then use their vocabulary knowledge in decoding words in the text, to confirm, deny, or modify previous expectations (Aebersold & Field, 1997). This process is often called sampling

of the text. To illustrate the sampling process, Cohen (1990) claims that the reader does not read all words and sentences in the text, but rather chooses particular words and phrases to understand the meaning of the text. Considering this model refers to the interests of the reader, as well as their world experience as the stimulant to reading comprehension (Barnett, 1989; Goodman, 1968), the ability to create meaning from this respective knowledge is why this model is attractive since it is likely that the text has no substantial meaning in and of itself (Carrell & Eisterhold, 1983; Rumelhart, 1980).

2. 1. 2. The Bottom-up Model

The bottom-up theory of reading was a predominant theory in the 1960s which was restored by Gough's (1972) views of the reading process. This model is frequently classified as a linear model. The reader begins to recognize letters in the decoding process and then decodes words and then sentences. It is a data driven process as it basically uses the textual components in constructing the meaning of a passage. Although this model emphasizes the written text rather than the readers, comprehension in the bottom-up model begins with the process of understanding the small linguistic units, and then the reader works towards the larger units.

The text is a “chain of isolated words, each is deciphered individually” (Martinez-Lang, 1995, p. 70), so the reader is someone who “approaches the text by concentrating exclusively on the combination of letters and words in a purely linear manner” (p. 70). For most readers who are capable at a fluent level, they might be comfortable and feel natural during this process. Sight reading words in isolation, as part of rapid word recognition, is essential to this approach (VanDuzer, 1999).

In order to understand the total meaning within a reading passage, it is essential to – in the bottom-up models – know all the letters of a word within a sentence or part of a

sentence (such as in a clause) (Paron, 1997). As such, an in-depth knowledge of vocabulary supports the bottom-up approach during the reading process, even though, this approach could not entirely explain all processes at this stage. Despite this, the basic units of a sentence are necessary for understanding the text, and this recognition of letters assist the reader in the bottom-up model.

Another important aspect of the bottom-up model is its focus on orthographic recognition. Second language learners, like Thai people, whose first languages have different orthographic systems from the target language may have some difficulty in word identification and recognition (Coady, 1979). This observation emphasizes the role of vocabulary knowledge, which is done automatically with decoding in second language reading.

The top-down models focuses on such issues as background knowledge, strategy use, reading purpose, and interest in the topic as the main source of reading comprehension, while the bottom-up model is much more concerned with vocabulary, syntax, grammatical structure; that is, the text-based variables.

2. 1. 3. The Interactive Model

The interactive model is an interaction between the reader and the text in order to bring about comprehension (Bernhardt, 1991; Eskey, 1988; Grabe, 1991), while Barnett (1989) explained that “the reader interacts with the text to create meaning as the reader’s mental processes interact with each other at different levels to make the text meaningful” (p. 29). Numerous L2 reading researchers approve this model since various studies have been conducted on the implications of its variables (Akagawa, 1995; Bossers, 1991).

As discussed above, the major reading models proposes that vocabulary knowledge is an important aspect of these models. In the bottom-up model of reading, strong

vocabulary knowledge makes decoding and word recognition faster and more efficient.

Reading fluency and automatic decoding would not be attained without a strong knowledge of the meaning and form of words in the text. In the top-down model, vocabulary knowledge is part of the content and linguistic schema necessary for successful reading. In the interactive model of reading, vocabulary knowledge seems to be the most significant factor as it relates to both top-down and bottom-up processes. Eskey & Grabe (1988) maintain that although vocabulary knowledge is considered as a pivotal component of all reading models, it is also acknowledged as "a prerequisite to fluent reading" in the interactive model of reading.

2. 2. Vocabulary in L2 Reading

2. 2. 1. Defining vocabulary knowledge through frameworks

Numerous studies have recommended appropriate definitions for word *comprehension*, while Grendel (1993) has defined it as "knowing the meaning of a word" (p. 141). On the other hand, Vygotsky (1986) has claimed that "a word without meaning is an empty sound, no longer a part of human speech" (p. 6). Nation (2001) stated that a readers' understanding of the word should be both receptive and productive, for instance, "to cover all aspects of what is involved in knowing a word" (Nation, 2001, p. 26). Nine different categories are listed by him, which are as follows:

1. Spoken form
2. Written form
3. Word parts
4. Connection of form and meaning

5. Conceptual meaning
6. Association with related words
7. Grammatical functions
8. Collocation behaviors
9. Word usage constraints; appropriateness

These respective nine categories refer to both the receptive knowledge, which is essential for understanding the meaning of a word without the need to produce the word again, while productive knowledge is considered to be the knowledge that learners need to “produce language forms by speaking and writing to convey a message to others.” (p. 24). In other words, receptive knowledge is the language input that learners receive from others through listening or reading and trying to understand it. Productive knowledge, on the other hand, is the language output that learners use to convey messages to others, such as through speaking or writing. Furthermore, Ruddle and Unrau (1994) divided knowing a word into six categories:

1. Knowing the word meaning aurally
2. Knowing the word meaning but not expressing it
3. Knowing the meaning but not the word
4. Knowing the partial meaning of the word
5. Knowing a different meaning of a word
6. Not knowing the concept or the label

Thus, one's knowledge of a word does not have to include both receptive and productive control to perform certain tasks. Schmitt and Meara (1997) stated that native speakers do not master all types of word knowledge. It is likely that they use only a certain number of word knowledge for lexicon, while also having a low level of frequency words for receptive knowledge. Similarly, foreign learners do not require, or learn, the full set of vocabulary. In fact, it depends on what activity is being completed (Mezynski, 1983; Qian, 2002). Furthermore, certain tasks require only receptive knowledge and in reading tasks, the need to have receptive knowledge might be the only requirement. Foreign language learners require only a minimal level of word knowledge in order to understand the text, they do not need full knowledge of vocabulary to understand a reading passage. From either this full list, or partial list of word knowledge, learners are able to grasp further information about a word, as recommended by Henriksen (1999) who noted vocabulary development in three areas:

1. Partial to precise knowledge
2. Depth of knowledge
3. Receptive to productive ability

As previously noted, foreign language readers should improve both their receptive and productive vocabulary knowledge abilities so that they could enhance their list of vocabulary. Research has found that, “when readers increase their vocabulary size, their use of language skills implicitly increases and their knowledge of the world also becomes broader” (Huang, 1999, p. 43), ultimately, the greater the list of vocabulary a student has, the greater their ability to understand it. In order to read effectively, foreign language learners should improve their list of vocabulary (Bernhardt & Kamil, 1995). In 2001, Graves, Ryder, Slater and Calfee created a process of five stages of vocabulary knowledge:

1. Learning to read a known word
2. Learning new meanings of known words
3. Learning new words that represent known concepts
4. Clarifying and enriching meaning of known words
5. Moving words from receptive (listening and reading) to expressive (speaking and writing) vocabulary (p. 81).

The above definitions of vocabulary knowledge strengthen the argument that there is a relationship between vocabulary and reading comprehension.

2. 2. 2. Vocabulary Knowledge and Reading Comprehension

Vocabulary knowledge plays a significant role in reading comprehension. Acquiring new English vocabulary, for foreign language learners, is often done through reading, although, it is possible that many of these learners are unable to cultivate their writing or speaking skills since they do not frequently reside in a native English speaking nation (Bernhardt, 1991). In order to read effectively and understand a language better, one needs to possess sufficient vocabulary. Scholars state that vocabulary is necessary for appropriate comprehension of a text, and studies have noted the significance of vocabulary knowledge as a variable that is able to predict a learners' level of reading comprehension (Hu & Nation, 2000; Laufer, 1989; Maher Salah, 2008). In addition, vocabulary is essential because it helps learners of English as a Foreign Language (EFL) to understand a text (Leki & Carson, 1994). It can also help ESL/EFL learners to develop the capability to learn and use language (Ellis, 1997; Nation, 2001). Presently, several teachers affirm that when their students face an unfamiliar text in the foreign language, the first challenge appears to be its vocabulary (Grabe & Stoller, 2002).

According to Krashen and Terrell (1983), knowledge acquisition is created by understanding a variety of vocabulary (Hell & Mahn, 1997) since it is the foundation of learning a new language. Moras and Carlos (2001) completed studies which found that foreign language learners who are successful in their learning are frequently able to express their ideas well due to this very fact that they have a wide range of vocabulary. As such, knowing a sufficient list of English words is necessary to understanding the context of a passage (Leki & Carson, 1994). Meara (1996) also claimed that those who have a significant level of vocabulary are able to grow in other skills as well.

Nation and Newton (1997) supported Meara in that growth in vocabulary leads to a greater capacity in other language skills, in fact, when language learners know more vocabulary, they begin to greatly improve their comprehension of a language much more than previously. In addition, Laufer (1989) was more specific when she revealed the importance of having sufficient vocabulary for reading comprehension, claiming that a reader whose vocabulary is insufficient to cover at least 95% of the words in a passage will not be guaranteed sufficient comprehension. Readers themselves consider vocabulary knowledge to be the main obstacle to second language reading comprehension. However, Nation (1990) argued that a person's knowledge of a word should entail both receptive and productive knowledge, all aspects of what is involved in knowing a word, which includes forms, meaning and usage.

2. 2. 3. Receptive and Productive Vocabulary Knowledge

Researchers have defined receptive vocabulary as a set of words which are commonly used for reading or listening, and which are recognized lexical units (Nation 1990/2001), while, Doff (1990) stated that *passive* vocabulary is also a common term. On the other hand, *productive* vocabulary refers to words that are recognized by learners when speaking or writing (Read, 2000). Studies by Doff (1990) defined the words that students

understand and are able to use as *active* vocabulary. As mentioned earlier, receptive knowledge is the language input that learners acquire from others through listening or reading and then trying to comprehend it. While productive knowledge is the language output that learners use to communicate to others by either speaking or writing. As a result, both reading and listening will require a suitable level of receptive vocabulary, but on the other hand, speaking and writing requires emphasis on productive vocabulary.

2. 2. 4. Breadth and Depth of Vocabulary Knowledge

Two important factors for a learners' lexicon require both the depth and breadth of vocabulary knowledge, this includes linear and unidimensional factors (breadth), while depth is distinct in that it can refer also to relationships of a semantic nature, collocations and syntactic patterning. Read (1993) also refers to the learners' capacity, or level, to understanding numerous meanings of a single word as well, while Cobb (1999) stated that the implicit meaning also has a role to play since it requires a habit of reading to grasp a words' full meaning and purpose within a sentence. Nation (2001), on the other hand, refers to the breadth of vocabulary as the population of words in which a learner has a thorough understanding. Overall, a learner should not depend solely on translating it into their mother tongue in order to grasp the full meaning (Unalidi, 2011), rather, other perspectives should also include word associations, limitations, pronunciation, as well as spelling and discourse features. It might also require understanding the frequency of the word in the target language and many other aspects which should also be considered (Akpınar, 2013; Milton, 2009; Nation, 1994; Qian, 1998; Zhang, 2012).

2. 2. 5. Research on Vocabulary knowledge and Reading Comprehension

Various studies have been completed on the topic of vocabulary knowledge and reading comprehension, in fact, the study of the role of vocabulary knowledge was undertaken

by Zhang and Annual (2008) where they found that the reading scores of 37 Singaporean students were significantly correlated with 2,000-3,000 word levels, after having completed The Vocabulary Size Test.

In particular, a study of 155 English university students conducted by Guo (2008) found that a strong positive correlation existed between the vocabulary knowledge of students and their reading comprehension, this could be interpreted as having an effect on learners' reading comprehension since the relationship between vocabulary, syntactic awareness and reading comprehension was clearly evident.

Similarly, a study by Shiotsu and Weird (2007) indicated a strong relationship between vocabulary knowledge and predicting student performance regarding a reading test, of which the pilot study was conducted at university level across both Japan and the United Kingdom.

Moreover, Snow (2002) acknowledged the strong relationship between a kindergarten vocabulary knowledge and reading comprehension increased considerably at the same time as the children developed in grade level. The correlations for first graders, fourth graders, and seventh graders were $r=.45$, $r=.62$, and $r=.69$, respectively.

Furthermore, data collected by Maher (2008) who undertook a study of the relationship between vocabulary knowledge and reading comprehension of authentic Arabic texts of twenty-three learners at Brigham Young University, found that they needed to know approximately 90% of running words to adequately comprehend the first passage and around 86% to comprehend the second passage. The study, that required students to complete two reading comprehension tests and which ranged from low to middle level in both the productive and receptive skills concluded the research findings.

Golkar and Yamini (2007) identified a relationship between learners' vocabulary knowledge and their capacity to comprehend reading tasks sufficiently, in particular, three tests were conducted to measure the results and they included The Vocabulary Test, the Productive Version of the Vocabulary Levels Test as well as a TOEFL test. Of the 76 Iranian undergraduate students with an age range of 20 to 30, majoring in engineering and English Language and Literature, a high correlation was confirmed.

Previous studies focused on university students, but similar results were found for younger age groups as well. In fact, further studies by Kaivanpanah and Zandi (2009) were conducted regarding the TOEFL test, which measured the level of a learners' reading comprehension, and an examination of their studies found that vocabulary knowledge was indeed a requirement for effective reading comprehension (Qian & Schedl, 2004) for those who were as young as 13 years of age.

Furthermore, a study by Mehrpour et al (2011) found that there was a positive correlation between learners who had both a greater understanding of a word and the size of their vocabulary. Research from his study noted that, of the 60 participants, the depth and breadth of their ability to comprehend a reading passage was positively linked to a deeper knowledge of words; thus, they were able to grasp the overall context and meaning more effectively.

Srisawat and Poonpon (2014) conducted a study on the vocabulary size among 371 first-year Thai students at Khon Kaen University. The instrument used for this study was a Revised Vocabulary Level Translation Test (RVLTT), which was adapted from a Vocabulary Level Test of VLT (Nation, 1990). The results revealed that the average vocabulary size of the 371 university students was approximately 1,039 English words (out of 2,570 words) or 40.43%. The average percentage was below 80%. That means the students did not reach any

word level and did not meet the language requirements (2,000-3,000 words). They found that having a large word size was necessary for understanding a text.

Furthermore, Pringprom (2011) investigated the relationships between English vocabulary size and reading comprehension performance from among 30 undergraduate students at Bangkok University. The Vocabulary Levels Test bilingual version (English-Thai) was administered to assess the subjects' receptive vocabulary size, and a multiple-choice-question format reading test to measure subjects' reading comprehension ability. The finding revealed that the subjects' English vocabulary size and their reading comprehension were positively correlated.

This review indicates that vocabulary knowledge plays a very crucial role in reading comprehension performance, and reading investigation has continuously conducted with a word knowledge component on which vocabulary tests administer positively. However, it may be important to recognize that, to the best of my knowledge, no previous research has examined the relationship between vocabulary size and individual reading skills, as attempted by this study.

2. 3. L2 Linguistic Threshold

2. 3. 1. The Definition of Linguistic Threshold

The primary definition of the word *threshold* is an entrance or doorway, or, more abstractly, a level, point, or value above which something is true or will take place and below which it is not or will not (Lee & Schallert, 1997).

Smith (1995) stated a language threshold as a "passport for learning" (p. 20). He proclaimed that "you cannot become a member until you are familiar with the language, and you cannot learn the language until you join the club" (p. 20).

Nation (2001) proposed two definitions of the lexical threshold. The first definition can be determined as the traditional meaning that sees a threshold as “an all or nothing phenomenon. If a learner has not crossed the threshold, then adequate comprehension is not possible” (p. 144). If a learner has crossed the threshold, comprehension becomes possible. The second definition of the language knowledge threshold, given by Nation, suggests that if a learner has not crossed the threshold, the possibility of comprehension is low: “if the learner has crossed the threshold, the chances are on the side of the learner gaining adequate comprehension” (p. 144); this is what Nation described as a *probabilistic boundary*.

2. 3. 2. The Development of the Notion of Linguistic Threshold

Clarke (1980) first presented the notion of a second language threshold when he proposed that inadequate second language ability results in *short circuit* transforming from L1 skills to L2. Cummins (1980) continued the research along the same lines. He introduced the notion of a threshold for language proficiency, stating that there were thresholds of different skills of language knowledge. The research on the threshold hypothesis continued with a specific interest in a lexical threshold and its implication on L2 reading comprehension. In order to achieve proficiency in a second language, the learner must gain a certain linguistic level in L2 before other variables, for example, background knowledge and reading strategies, begin to affect reading comprehension (Ridgway, 1997).

2. 3. 3. Lexical Threshold for L2 Reading Comprehension

L1 reading skills are not acquired by a learner supernaturally (Koda, 1988), despite this, readers might improve their effectiveness of their reading capability as a result of reading. In fact, Laufer (1992) noted that there is a lexical threshold below which L2 readers could utilize reading strategies, however, it was Bernhardt and Kamil (1995) who stated that “in order to read in a second language effectively, a level of second language linguistic

competence must first be achieved” (p. 17), this implies that the lexical threshold is a necessary requirement for reading comprehension.

Since the lexical threshold is a requirement, it is prudent to understand a key factor which makes up the threshold itself, in fact, “the nature of the threshold of reading comprehension shows that vocabulary is the most significant factor for interpretation of the threshold” (Huang, 1999), and Laufer (1992) noted that the critical factor is “the number of words the reader must have in his lexicon to be able to read in L2, namely the number of words composing the threshold vocabulary which will guarantee the transfer of reading skills from L1 to the L2” (p. 127).

Interestingly, Laufer and Sim (1985) found that – in order to determine the particular threshold scores of L2 learners – interviews as well as the use of comprehension questions were utilized, which implied that a minimum of 65 to 70 percent within the *First Certificate English* examination was critical when determining the competency of L2 reading comprehension. As a result, it was also noted by the researchers that those same learners’ who scored below this the respective minimum percent were unable to transfer their strategies from L1 to L2. Indeed, not only did the results illustrate that subject knowledge and syntactic structure was needed, the implication also demonstrated that in order for reading comprehension to be well established, an extensive level of vocabulary was also required.

Laufer (1989) went further by determining a recommended level of running words in order to grasp sufficient comprehension of a passage, and the researcher subsequently found that those who took part in the reading test - and who received a score of 95 percent - were also among the highest in their group to achieve above 55 percent for the vocabulary test. To illustrate this, the respective author surveyed a group of university students in Israel and found that their vocabulary size and their reading comprehension ability was approximately

3,000 word families (Laufer, 1992). With this many words, the students were provided with a lexical threshold of 95 percent and reading scores of 56 percent; this led the author to conclude that the reading comprehension of learners' is affected by the ratio between familiar and unfamiliar words.

Like Laufer, various other studies have found that the minimum level of word knowledge is approximately 3,000 (Coady, 1997), which will support learners with appropriating adequate comprehension, while, studies by Hirsh and Nation (1992) comparatively found that 98 percent (5,000 word-families) was more appropriate.

Research by Nation (2001) found that “any number of word families needed to cover certain percentage in a text depends on: 1) Type of text – novel, newspaper, academic text, etc., 2) Length of text, and 3) homogeneity of text; is it on the same topic and by the same writer?” (p. 146).

Furthermore, it is important to recognize at this stage that reading comprehension regarding the lexical threshold depends on particular variables, for instance, prior knowledge or a readers' familiarity about the topic (Carell & Eisterhold, 1983). While the ability to understand a context is important, many L2 readers are challenged based on their lack of prior knowledge surrounding the passage. Despite this, reading comprehension may depend on having a strong linguistic threshold, prior to having sufficient background knowledge, as more essential (Ridgway, 1997). The linguistic lexical threshold could be considered to be necessary for all reading comprehension, especially for L2 readers who require a minimal level of lexical coverage to reach a suitable level of understanding. As respectively noted, one might state that the lexical threshold is critical in order to command an effective level of reading comprehension, in fact, scholars have even suggested that 95 percent (3,000 word-families) is a particularly suitable level of word knowledge.

2.4 Lexical Inferencing

2.4.1 Lexical Inferencing, Reading Comprehension and Lexical Development

Research has found that the development of language comprehension is significantly related to the role of vocabulary development, in fact, they both act as supporting structures towards the acquisition of foreign languages, vocabulary size and reading comprehension.

For L1 learners, Laufer and Hulstijin (2001) stated that young learners require extensive reading in order to effectively grasp the meaning of the words used, for instance, exposure to words through conversational English assists the intake of new words and different word forms. Although it is widely understood that L1 learners have a deeper understanding of a wider variety of words, these learners may also find it easier to grasp the meaning of unfamiliar words given their familiarity with the language itself, as opposed to L2 learners who may lack either cultural or linguistic richness of the main language (Laufer & Hulstijin, 2001).

Despite this, as L2 learners become older, they develop their expertise with the English language – in particular with self-confidence to practice new words – while, literacy skills cultivate greater development towards a larger vocabulary size. According to Laufer and Hulstijin (2001), this cultivation results in better reading comprehension performance, while L2 learners are more responsive with reading passages in order to cultivate growing their vocabulary size.

On the other hand, research by Nation (1990) has shown that whenever unfamiliar words are presented to a reader, techniques are utilized to assume the most appropriate meaning of the word based on surrounding text. For instance, lexical inferencing is used to comprehend reading passages that require interpretation of a new word or word form without understanding the entirety of the meaning of the unfamiliar word. Since lexical inferencing refers to the connection that readers make when interpreting an unfamiliar word, it is well-

known that comprehension of a word is greatly increased through understanding the context of the overall passage itself. Since L1 learning requires reading comprehension to support inferencing at multiple levels of reading performance, lexical inferencing is a strong factor that relates both vocabulary size and reading comprehension performance with particular emphasis on learning new words during this very process of reading a text.

As a result, inferencing cannot be simply an educated guess, instead, it requires the knowledge of many words in order to identify an appropriate inference that assists in the ultimate determination of an unfamiliar word, which is likely to occur when surrounding words are recognized by the reader. Once put in context, individual words can be connected together to demonstrate contextual meaning using information from near words, or words within the same sentence structure. Despite this, L2 learners must proceed with unfamiliar words and different word forms to garner the best determined meaning of an unfamiliar word. For instance, previous experience with a word or being mindful of unfamiliar words used in external situations may act as a means to support the L2 reader's *best guess* to demonstrate what they believe to be the most appropriate meaning of a new word, in particular, where the L2 reader has no experience with the unfamiliar word even as an L1 learner (Nation, 2001).

Instances where the situation might be challenging with negative flow on effects could be when the incorrect meaning is associated with an unfamiliar word, leading to total misunderstanding of the entire reading passage. As such, it is essential that vocabulary size and reading comprehension are not only identified as being linked, but that the accuracy of the text itself reveals the most appropriate meaning for the EFL learner (Laufer & Hulstijn, 2001).

For this reason, checking and verifying the accuracy of the EFL learners' understanding of the reading passage is essential to lexical inferencing. In fact, for reading comprehension to be effective enough to engage in positive lexical development; it is necessary for the learner to recall numerous other potential meanings in order to deduct incorrect inferences and select the

most appropriate meaning. In fact, learners at the respective school and those at other high schools are commonly reading with the goal to enter university. Such entrance examinations require lexical inferencing for those who have difficulty grasping the entirety of the text itself, in particular for learners who are developing their L2 capacity.

Even though research is still in the early stages regarding L2 and L1 lexical inferences, enough research has been interpreted to identify the challenges faced by numerous L2 readers (Nation, 2001). In fact, research has shown that - in addition to gaining in-depth insight into the meaning of an unfamiliar word - the ability to properly implement lexical inferencing throughout a reading passage suggests that EFL learners may become more prepared to successfully gain entrance into international universities or departments, thus lexical inferencing supports student achievement with regards to aiding with comprehension of unfamiliar words. Although this might lead to the development of improved reading comprehension performance, vocabulary size stills play a significant role for L2 learners differently than L1 learners (Nation, 2001).

2.4.2 Lexical Inferencing and Vocabulary Comprehension

It is not surprising that in order to correctly implement lexical inferencing from within a reading passage, it is important for the reader to be able to comprehend some other parts of the reading passage as well. In fact, although some research has indicated a 95 percent overall comprehension of other words within the reading passage is needed in order to justifiably assume the most acceptable understanding of the unfamiliar word, other research have indicated a 98 percent threshold. What is never deniable in the research is the link between vocabulary size and reading comprehension performance, that is, whenever the vocabulary size of a reader is suitably high so too is their likely scores in reading comprehension. As a result, the breadth of a readers' vocabulary is likely to assist even when unfamiliar words appear to the reader in a reading passage (Nassaji, 2004).

While this is widely accepted amongst the linguistic community, some prefer the development of productive ability in order to support a more depth-based vocabulary knowledge (Nation, 1990).

Despite this, studies by Read (2004) on the topic of lexical inferencing have suggested there to be paradigmatic and syntagmatic distinctions to a word. In certain circumstances, the test – as authored by Read (2004) – recognizes the challenges of learners to be able to correctly identify meanings of unfamiliar words; thus the difficulty of a reading comprehension task could be more understood.

While this has helped to widen the available research on how EFL learners comprehend unfamiliar words, it suggests that educators are equally able to take on this opportunity to develop their teaching strategies in a manner that supports lexical inferencing for test preparation subjects.

While Nation (1990) has also developed a test to measure the readers' vocabulary language capacity, other tests have also been available to measure the breadth of a learners' word recognition. For instance, Read (2004) authored the English Word Association Test (WAT) which has also been helpful in examining various relationships of lexical inferencing and word recognition. However, it was Read's (2004) test that demonstrated that learners' were able to make distinctions between certain words and their meaning in such a way that they were able to create inferences from the reading passage.

As a result, research by Nassaji (2004) has shown that in order for EFL learners to achieve a reading comprehension performance score that is high, it was important for the learner to have an extensive vocabulary size. Furthermore, it was found that lexical inferencing was also greatly improved as a result of vocabulary size having been improved. Therefore, L2 word recognition and vocabulary size had a positive effect on reading comprehension performance of L2 learners.

2.4.3 Lexical Reactivation and Vocabulary Retention

Extensive reading in as much as ten instances have demonstrated that language acquisition has, since the 1980s, supported the growth of vocabulary acquisition (Nation, 1990). On the other hand, unfamiliar words are not commonly experience by the L2 learner which is reason enough as to why they have seldom come across the word itself. This unfamiliarity is potentially exasperated by the fact that most L2 learners may not come into enough contact with less used word so that effective acquisition of it could be attained and sustained through the learning process.

The findings of previous research by Laufer and Hulstijn (2001) have reiterated the role of lexical inferencing as a key component that encourages learners to engage in not only literal or inferential reading skills, but also towards critical analysis of written texts. On the other hand, other studies have suggested that learning new vocabulary or expanding the size of a learners' vocabulary range should not depend only particular frameworks, instead, directed learning of increasing vocabulary size to improve reading comprehension could be more supportive of a learners' vocabulary retention. With this in mind, specific vocabulary was frequently identified as having a greater effect with regards to vocabulary retention if the different forms of the word were provided to the learner. On the other hand, studies by Nation (1990) have stated different results by illustrating that greater benefits could be made by proficient L2 learners if they read more frequently or extensively and that this will assist in both vocabulary knowledge and recognition, while, simultaneously improve their overall reading comprehension.

While studies have suggested that focusing on a word's pronunciation, its grammatical category, meaning and semantic relation is likely to induce some form of familiarity (Laufer & Hulstijn, 2001) to the reader during a comprehension component, it was also suggested by other research that inferencing was much more likely to occur based on new word knowledge.

This means that there is a cognitive component to how learning strategies might induce greater vocabulary retention and lexical reactivation. Despite this, similar studies have found that more complex constructs of lexical information might lead to more critical reading skills necessary for academic learning in a grade 12 EFL environment.

While information processing garners significant influence with respect to cognitive learning strategies, learning tasks that investigate the role of lexical reactivation and vocabulary retention have demonstrated the negative implications of focusing solely on cognitive learning strategies that promote these skills. In fact, some studies have even stated that shallow processing of word knowledge is likely at the expense of profound or critical reading skills.

As a result, it is not sufficient to simply engage in L2 reading exercises in order to sustain vocabulary retention or engage in lexical reactivation since many unfamiliar words are unlikely to be consistently seen enough in order to remain in the memory of L2 readers.

2.5 Instructional Leadership for EFL Classrooms

In order to recognize the role of EFL teaching strategies on EFL learners, it is important to be mindful of the role of educational administrators within the school environment. Since educational administrators could be either the school board, superintendent, school principal, teacher or any other leader within the school; it is relevant to discuss their role in forming EFL enhancing the development opportunities within the school itself – either for the learner or for the teacher (Sawatsupaphon, 2018).

In particular, research has shown that instructional leadership plays a significant role in enhancing the learning environment for learners as well as for teachers. Since research has shown that parents are the most important educators of a child at home, it is well known that extra-curricular or co-curricular tasks can be used to attain higher levels of academic achievement. However, such activities require the ongoing support of a wide range of key players, in particular, the parents, the teachers, as well as the school principal.

The principal's role in forming an effective EFL program to sustain appropriate EFL teaching strategies largely depends on professional development opportunities given to teachers. In this way, teachers are able to garner the most modern methodologies in teaching EFL to their learners (Sawatsupaphon, 2018). While this has been widely established as a significant factor for most school subjects, foreign language learners are not the exception. In fact, professional development may help in a variety of ways including the integration of new technology into the classroom, the use of online learning platforms and social media sites to sustain L2 vocabulary growth, as well as to enhance the reading comprehension through L2 learner journals.

While a variety of studies have demonstrated that instructional programs may not be easily adjusted without direct intervention of school administration, the lesson plan may be suitably adapted according to the needs of the overall dynamics of the classroom (Sawatsupaphon, 2018). For instance, research has shown that students' character motivation is key to identifying the learning styles of each learner. While EFL teachers may not have completed subjects in educational psychology, professional development may offer a suitable avenue to understand the necessary concepts in order for teachers to suitably adapt themselves and their teaching strategies for the benefit of their learners.

Furthermore, it is well known that teaching strategies and learning strategies should go hand-in-hand, and by complementing each other through building trust and security within the classroom; students may begin to feel more confident in themselves to practice with new words (Sawatsupaphon, 2018). As a result, research has shown that this may have a positive effect on overall reading comprehension performance. However, studies have suggested that EFL teachers should become communicate more with other EFL teachers in order to have demonstrated to them a variety of other teaching techniques. Identifying what techniques work,

and which techniques do not, may highlight patterns that assist in the development of a lesson plan that supports student academic achievement and motivation.

2.6 Learning Strategies

New cognitive learning theories highlight the importance of the thinking processes of students. If learning a language is to take place, students must be mentally active and engaged in developing their information processors. Several parameters should be met in these formulations if learning is to take place. Students first have to take care of learning information. Secondly, by constructing or defining relationships between ideas, the students should produce appreciation of the material under study. Thirdly, new approaches must be linked to background knowledge. Fourthly, students must recognize that learning takes incredible effort—high achievers are strategic in their study regimes, while poor students may not be appreciative of these learning strategies or the implications of not studying effectively. In fact, learning occurs when a learner appreciates the learning strategy being implemented (Sawatsupaphon, 2018). In fact, Seifert (1993) stated that whenever students receive technical information, linking current information with past knowledge is a key component to learning effectively and doing so in a way that supports retaining the knowledge.

Summarizing information is also widely accepted as a means to learning strategically. Seifert (1993) stated that students are often asked to read wordplay and absorbed information in this wordplay. Apart from the memory of bits of information spread all through the text, students must recall key elements and main ideas. Resuming is one strategy shown to improve the memory for main ideas. The students read a segment of the wordplay - of roughly a paragraph -in summary and then compose a phrase which characterizes the wordplay. Extensive research has shown that a summary of about 33 percent can enhance wordplay memory.

2.7 Reading Comprehension Strategies

As the above text had noted, trust is essential within a classroom if the teacher wishes to overcome issues of self-confidence. However, reading comprehension strategies were suggested by Hammerberg (2004) who noted that it was also important to empower students so that they may gain some form of autonomous learning on their own. With this in mind, Hammerberg (2004) stated that creating a learning environment that was both respectful of social dynamics and student learning styles, while also increasing student academic achievement. Despite this, learners were also encouraged to know their own mindset so that they may break down barriers to further their own education.

On the other hand, Hammerberg (2004) also reiterated the various tools necessary in order to grasp literal, inferential, and critical reading skills needed to understand a reading passage. This may assist in building a sort of framework in which L2 learners might pull from in order to grasp various meanings from (in the case of unfamiliar words). For instance, experience of social etiquette or cultural identity could be one way in which ideas could be generated in order to support a contextual analysis of a reading passage by the learner.

Further strategies also included being mindful of how social interaction is used to develop learning on behalf of the L2 student. For instance, research has found that communicating verbally between classmates may help to empower students and develop their own sense of self-confidence, when this occurs, it is likely that connections are developed between them where L2 learners are not afraid to try using unfamiliar words.

In addition, students should not be afraid of their own different perspectives when compared to the ideas or point of views of other L2 learners. As such, interaction is key to developing learning strategies that engage students (Hammerberg, 2004).

2. 8. Vocabulary Size Strategies

Hammerberg (2004) found that learners should know their individuals' *goals* that motivate them to learn English, while those motivating factors could be used to enhance the vocabulary size of the learner. For instance, if a learner has a particular interest in automobiles then the learner might focus on acquiring vocabulary with a particular emphasis on cars, buses, vans, trucks and so on, as a means to initially increase their vocabulary size.

Furthermore, understanding the origin of words while being able to *source* the origin of the word through word formations is a critical aspect of language acquisition. By knowing the source of various forms of words, understanding unfamiliar words may in the context of a reading passage can encourage a learner to consistently make connections between certain word forms. Since unfamiliar words are likely in most circumstances, cultivating a method or strategy that assists learners will help to improve learners' vocabulary size.

In addition, *process* as a strategy through vocabulary knowledge assists in both the acquisition of a word as well as the retention of the word too. By using various strategies that support a learner in remembering words such strategies like word games, word puzzles, cognitive strategies, meta-cognitive strategies, and compensation strategies could highlight any missing gaps that could be improved upon.

2.9. Conclusion

In line with the previous research, this literature review indicated that a close relationship has been confirmed between vocabulary knowledge and reading comprehension. It has been established that vocabulary knowledge has a tremendous effect on reading comprehension. No text comprehension is possible, either in one's first language or in a foreign language, without comprehending the text's vocabulary. When the percentage of unknown vocabulary increases, the possibility of understanding the text decreases. L2 learners need

sufficient vocabulary that acts as a lexical threshold between adequate and inadequate comprehension. Foreign language readers should acquire this lexical threshold in order to read effectively. Most studies in ESL identified the percentage of word coverage necessary for a wide variety of contexts, and it was Nation (2000) who recommended a level of 98 percent for novels. Laufer and Sim (1985/1989/1992) found that 95 percent of known words are needed for adequate comprehension of any authentic text. While studies have suggested that greater knowledge has been circulated around the role of lexical inferencing, it remains a necessary research topic that incorporates the role of vocabulary size in order to further develop a better reading comprehension performance by learners. Although lexical reactivation and vocabulary retention are essential components to the development of lexical inferencing, this literature review has also demonstrated that there are differences between L1 learner needs and L2 learner needs. One way to reconcile these concepts together is to recognise the role of learning strategies by L1 and L2 learners, with particular emphasis on teaching methodologies within the classroom instructional program. Although the acquisition of new words to increase vocabulary size is commonly reconciled with the use of various vocabulary learning strategies, the need to improve a learners' reading comprehension vocabulary is often alleviated by building trust between the learner and teacher, creating a positive classroom learning environment that improve self-confidence in EFL learning, as well as social integration to communicate verbally and through written text, any expressions needed to complete a task. Interestingly, it was also important to note that research identified how important having the right mindset was, for instance, Hammerberg (2004) found that learners should be open to discussion and willing to listen to other learners' point of view on various topics that engage communication within the classroom.

CHAPTER III

RESEARCH METHODOLOGY

This chapter described the overall design of the study, its population, sample, instruments, collection of data, and data analysis. The purpose of the study was to examine the strength of the relationship between vocabulary size and reading comprehension performance of 12th grade Thai EFL learners at Pramandanijjanukroah School in Bangkok.

3. 1. Research Design

The study utilized a correlational method of research. This involved measuring the subjects' performance on tests of their competence in two variables (reading comprehension performance and vocabulary size), then using inferential statistics (correlation) to measure the strength of the relationship between the two variables, based on the scores on the two tests. The subjects' vocabulary size scores were then correlated with scores on items testing particular reading skills in the reading comprehension test in order to ascertain whether vocabulary size has a stronger relationship with some reading skills than with others. The degree of the relationship was shown as a correlation coefficient. If there appears to be a relationship between two variables, it means the scores within a certain range on a particular variable are related with scores within a certain range on the other variable. Correlational research is also taken as a type of descriptive research because it describes an existing condition.

Statistical methodologies were used to determine and analyze any potential relationship between vocabulary size and reading comprehension performance of 12th grade Thai EFL learners at Pramandanijjanukroah School, one of the private Catholic schools in Bangkok.

3. 2. Population

The population for this examination consisted of 140 students at Pramandanijanukroah School. It is a private Catholic school in Bangkok with more than 4,200 students from kindergarten to grade 12. This school was chosen because it offers higher secondary level and it was convenient for the researcher to conduct the research as she is employed in this institution.

3. 2. 1. Background of the selected Private Secondary Catholic School in Bangkok

Pramandanijanukroah School has more than 4,200 students from kindergarten to grade 12. It was established in 1985. It is a fee-paying non-profit school run by the Archdiocese of Bangkok and managed by St. Paul de Chartres nuns. It is situated at Nawamin 81, Nawamin Road, Klongchan, Bangkok, Bangkok. It is one of the biggest parochial schools in Bangkok. The mission and vision of the school is aimed at encouraging and empowering all learners to be a model of self-awareness, nurtured by love and knowledge, to enhance their learning journey for the benefit of their future. To enable all learners' access to learning through highly effective teachers and focused on improving students' outcomes. At present there are about 900 students in high school. The curriculum requires the students to learn English as one of the main subjects, with a focus on English reading comprehension skills. The English curriculum aims to develop students' reading skills and strategies, namely:

- Previewing: reviewing titles, section headings, and photo captions to get a sense of the structure and content of a reading selection;
- Predicting: using knowledge of the subject matter to make predictions about content and vocabulary and check comprehension; using knowledge of the text type and purpose to make predictions about discourse structure; using

knowledge about the author to make predictions about writing style, vocabulary, and content;

- Skimming and scanning: using a quick survey of the text to get the main idea, identify text structure, confirm or question predictions;
- Guessing from context: using prior knowledge of the subject and the ideas in the text as clues to the meanings of unknown words, instead of stopping to look them up;
- Paraphrasing: stopping at the end of a section to check comprehension by restating the information and ideas in the text.

3. 3. Sample

The sample for this study was the population of 12th grade students who were enrolled during the first semester in the academic year 2018. There were 140 students, 56 males and 84 females with age ranges from 17 to 18 years. There were four classes in grade 12, each of which consisted of 24-45 students. Each class had different programs of study namely; Science-Math program, English-Math program, Chinese-Art program, and Arts-Computer program. Within each class there were different levels of English proficiency amongst students from pre-intermediate to intermediate.

Table 2. *Subjects of the study*

Academic Programs	Science-Math (Rm1)		English-Math (Rm2)		Chinese-Arts (Rm3)		Arts-Computer (Rm4)	
	M	F	M	F	M	F	M	F
	11	26	17	28	11	23	17	7
Total	37		45		34		24	
	140							

3. 4. Research Instruments

There were two instruments in this study:

1) *Vocabulary Levels Test*

The *Vocabulary Levels Test* (Nation, 1990), which is considered to be one of the most highly prized tools for measuring vocabulary, is frequently described as being the industry standard. In fact, the test itself is has been used internationally because it specifically measures a learners' ability to comprehend subject-based English words. As a lexical matching test that requires the matching of words with their definitions, it is structured around 2000, 3000, 5000-word levels and Academic Vocabulary (AWL); which are used to approximate the vocabulary size of test-takers. These were selected to gauge the vocabulary size of the subjects. Moreover, in this study, vocabulary size was conceptualized as the receptive meaning recognition of words and operationalized by VLT (Qian, 1999). There were three main reasons for using this test: a) *frequency levels profiling*, b) *statistical reliability* $\alpha=.97$ and c) *easy scoring*. For each correct answer, a mark was given. There was no mark deducted for wrong answers or unanswered questions. The vocabulary size was determined by multiplying the total VLT score by 100.

The *Vocabulary Levels Test* (VLT) has been widely respected for being the most standardized vocabulary test (Meara, 1994, 1996), since it was first developed by Nation in the early 1980's and which was subsequently revised in 2001 by Schmitt, Schmitt, and Clapham. As a tool that measures the vocabulary size of L2 test takers, it is – as previously noted – structured around four frequency levels of English word families, namely, 2000, 3000, 5000 and 10000, hence the name *Levels Test*. Access to different, and open-access, versions of the VLT test, can be retrieved freely through the websites of the respective test authors.

This research utilized the second version to assess 12th grade Thai EFL students' vocabulary levels. This study adopted the above tests as it has been widely used to measure L2

students' vocabulary knowledge. They have been tested for reliability for the 2, 000 Word Level Test (Cronbach Alpha of 0.922), 3, 000 Word Level Test (Cronbach Alpha 0.927), and the 5, 000 Word Level Test (Cronbach Alpha 0.927) (Schmitt, Schmitt, & Clapham, 2001) of which is a boundary level between the high frequency and low frequency levels. The *Academic Word List* was included in the tests as it contained sub-technical vocabulary needed for the subjects' studies. The 10, 000 Word Level Test was excluded in the tests after discussing with the supervisor as they are low frequency words and the subjects may not have an extensive vocabulary knowledge that would reach 10, 000-word level. In addition, administering the 10, 000 level to 12th grade Thai EFL learners is time poorly spent as it may not yield a lot of useful information. Likewise, very proficient or advanced students do not necessarily have to take the 2, 000 level if the teacher thinks this level may not cause lexical problems for the learners.

In each section of the VLT version 2, a set of 30 items were structured in a multiple matching format, with a total of 100 words for each frequency level. In order for learners to match the words (in the left-hand column) with their meaning-sense (in the right-hand column), clusters of 10 groups were used consisting of six words. As a result, the test required the test-taker to identify the form and not the actual meaning of the word (Schmitt, 2010). Thus, the VLT taps the very basic and initial stages of form - meaning link learning. Example items from each of the three frequency levels can be seen in Figure 3.

<i>Vocabulary Levels Test</i>		
<i>2000 Level</i>	<i>3000 Level</i>	<i>5000 Level</i>
1 copy	1 bull	1 analysis
2 event ____ end of the highest point	2 champion ____ formal and serious manner	2 curb ____ eagerness
3 motor ____ this moves a car	3 dignity ____ winner of sporting event	3 gravel ____ loan to buy a house
4 pity ____ thing made to be like	4 hell ____ building where valuable	4 mortgage ____ small stones mixed
5 profit another	5 museum objects are shown	5 scar with sand
6 tip	6 solution	6 zeal

Figure 3. Examples from the Vocabulary Levels Test (VLT) (Schmitt et al., 2001)

Each cluster targets three words, although some researchers have argued that knowledge of the meaning of the three distractor words is also tested as the test takers need to be familiar with them when they discard them (Read, 1988). Within each level, there is a fixed ratio of word classes to represent the distribution of English word classes. This ratio was 5 (noun): 3 (verb) : 1 (adjective) in the initial version of the VLT (Beglar & Hunt, 1999) and is now 3 (noun) : 2 (verb) : 1 (adjective) in the latest revised versions (Schmitt et al., 2001). Word classes are not mixed within any one cluster. For the 2001 version of the VLT, two parallel test versions are available that have been established to be relatively equivalent (Schmitt et al., 2001, Xing & Fulcher, 2007).

Furthermore, for each of the frequency levels, the test incorporates academic words from the University Word List (UWL) (Xue & Nation, 1984) in both the 1990 and 2001 versions (Coxhead, 2000). Despite this, the item sampling of the AWL section is not based on frequency levels, and so it should not be interpreted together with those levels. Nevertheless, the section might be useful as a separate measure for teachers in academic contexts.

2) *PISA Reading Comprehension Test*

An English reading comprehension test (selected from OECD's PISA Assessment of Reading test battery) was utilized, which focused on young people's ability to use their knowledge and skills to meet real-life challenges, rather than merely on the extent to which they have mastered a specific school curriculum. This test is generally more suited to the subjects of the study in the light of the PISA notion of English L2 Reading as a broad set of capabilities to enable young learners to solve problems and understand issues in the contemporary world. The reading paper consisted of 18 questions based on four different texts selected by teachers who are teaching English subject in 12th grade and two experts from Pramandanijjanukroah School and Assumption University respectively, with a view to provide a representative sample of the PISA reading comprehension test types. The reading texts covered all reading processes /aspects/skills as measured by PISA (2009): 1) *retrieving information consists of six questions with a score of eleven*, 2) *interpreting texts consists of eight questions with a score of thirteen*, and 3) *reflecting and evaluating information consists of four questions with a score of six*. In this study, retrieving information refers to student's ability to locate one or more pieces of information in a text, interpreting texts refers to student's ability to identify the main idea in a text, constructing meaning and drawing inferences from one or more parts of a text, and reflecting and evaluating refers to student's ability to make a comparison or connections between the text and background knowledge, or explain a feature of the text by drawing on personal experience and attitudes. The total score of the reading test was 30. Students who answered each question correctly got 1 point and 0 point for an incorrect answer. Each reading consisted of stimulus material such as texts, tables and/or graphs, followed by questions on various aspects of the text, table or graph. The questions used different formats: some were multiple choice, some required a short answer and some a longer constructed response. Hence, score varied in each question. Students had 90 minutes to finish

the PISA reading comprehension test. Topics of reading texts and types of skills being assessed were presented in Table 3 and Table 4 shows the reading performance test score based on Pramandanijjanukroah School curriculum.

Table 3. *Reading Texts and Skills being assessed in the study*

Skills Topics	Retrieving Information (RI) Questions	Score	Interpreting Text (IT) Questions	Score	Reflecting and Evaluating (RE) Questions	Score	Total Number of questions	Total Score
1. Lake Chad	1.1 1.2	1 1	1.4 1.5	1 1	1.3	1	5	5
2. Labour	2.2	1	2.1 2.3	1 5	2.4 2.5	3 1	5	11
3. Runners	3.2 3.3	1 4	3.1	1	3.4	1	4	7
4. Bees	4.2	3	4.1 4.3 4.4	1 1 2			4	7
Total	6	11	8	13	4	6	18	30

Table 4. *Reading Performance Score*

Reading Performance	Score
Very Satisfactory	30-20
Satisfactory	19-10
Unsatisfactory	9-0

3. 5. Validity and Reliability of the Instruments

The content validity of these research-designed instruments, namely;

1) Vocabulary Levels Test (Nation's 1990) measures the students' range of vocabulary as precisely as possible and this test has been widely accepted. As discussed previously, its

reliability has also been confirmed by numerous leading researchers. Furthermore, the content validity of the 2) *PISA Reading Comprehension Test* was validated and evaluated by the PISA organizers in which assessments by thousands of test-takers all over the world have been undertaken.

3. 6. Collection of Data

Vocabulary Levels Test and PISA English Reading Comprehension Test

The researcher administered the vocabulary levels tests on the 3rd of July 2018 during the first semester to all subjects in four different classes. Consent was obtained verbally from the academic administrators of the school before the instruments were administered.

The subjects of this study were informed about the research procedures and the objectives of this research, which were; 1) *to identify their reading comprehension performance* 2) *to determine their vocabulary size* 3) *to examine the relationship between the vocabulary size and reading comprehension performance* and 4) *to determine whether their vocabulary size relates to the following reading skills*, by such actions as: 4.1) *retrieving information*, 4.2) *interpreting texts* and 4.3) *reflecting and evaluating information*. The *Vocabulary Levels Test* allowed students to finish in 90 minutes. The reading comprehension test was given a week later on the 10th of July 2018 to all subjects for the conveniences of both students and teachers who would proctor the reading comprehension test. The allotted time was 90 minutes.

3. 7. Data Analysis

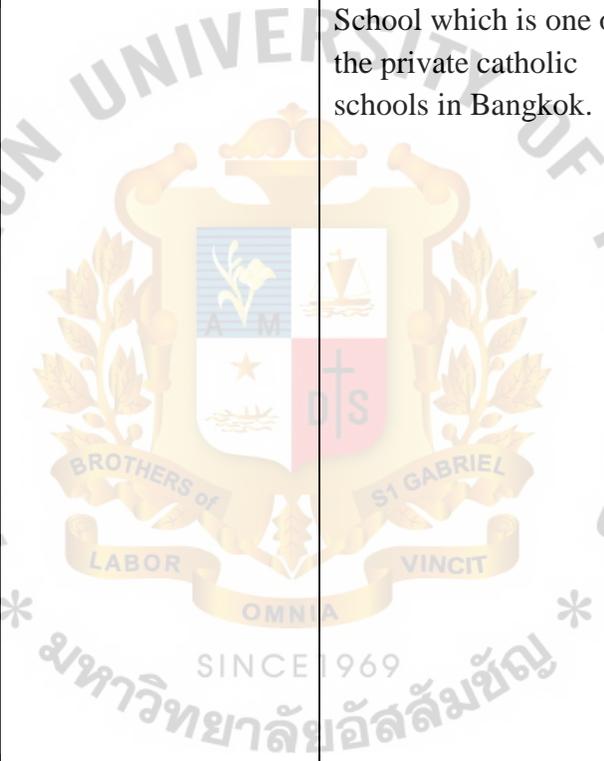
For objectives 1 and 2, first, descriptive statistics was used to summarize and display the mean scores on the VLT levels and provide a vocabulary size profile of the population, together with the mean scores on the reading test overall and mean scores for particular reading skills. For the objective 3, the Pearson Product Moment Correlation, a measure of the linear correlation between two variables, was used to calculate the strength of

the relationship between the scores on the two tests. For objective 4, the Pearson Product Moment Correlation of the reading comprehension scores of three sets of reading sub-skills and the vocabulary size tests scores were also calculated. The study assumed that a positive correlation exists between the two variables.



3. 8. Summary of the Research Process

Research objectives	Source of Data or Sample	Data Collection Method or Research Instruments	Method of Data Analysis
<p>1. To identify the reading comprehension performance of 12th grade Thai EFL students.</p>	<p>The two co-dependent variables in the study were vocabulary size and reading comprehension performance.</p> <p>The data consisted of vocabulary size scores and reading comprehension test scores. The latter consisted of three sets of reading sub- skills:</p> <ol style="list-style-type: none"> 1) Retrieving information (RI) 2) Interpreting text (IT) 3) Reflecting and evaluating (RE) <p>The sample were 140 students from 12th grade students at Pramandanijjanukroah School in Bangkok. Their level of English proficiency is pre-intermediate to intermediate.</p>	<p>1. Reading comprehension test score (Objective type and international validated PISA) and overall reading and three reading comprehension sub-skills.</p>	<p>1. Descriptive statistics was used based on the mean scores of reading comprehension test.</p>

<p>2. To determine the vocabulary size of 12th grade Thai EFL students.</p> <p>3. To examine the relationship between vocabulary size and reading comprehension performance of 12th grade Thai EFL students at a secondary school in Bangkok.</p> <p>1. To determine whether students' vocabulary size relates to the following reading skills: 1) retrieving information, 2) interpreting texts and 3) reflecting and evaluating information.</p>		<p>2. Students' scores on the Vocabulary Level Test (VLT) together with profiles of each student's knowledge of English words across the 2k, 3k, 5k and AWL levels.</p> <p>Data were collected on 3rd of July and 10th of July 2018 at Pramandanijanukroah School which is one of the private catholic schools in Bangkok.</p>	<p>2. Descriptive statistics was used based on the mean scores at 2000k, 3000k, 5000k and AWL.</p> <p>3. The Pearson Product Moment Correlation, a measure of the linear correlation between two variables, was used to calculate the strength of the relationship between the scores on the two tests.</p> <p>4. The Pearson Product Moment Correlation of the reading comprehension scores of three sets of reading sub-skills and the vocabulary size tests.</p>
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CHAPTER IV

RESEARCH FINDINGS

The objective of this study was to examine the relationship between vocabulary size and reading comprehension of 12th grade Thai EFL learners at Pramandanijjanukroah School. As previously noted in Chapter III, this study included two co-dependent variables, the vocabulary size and overall reading comprehension performance and individual reading comprehension skills as assessed by PISA. To identify a relationship between these two co-dependent variables in this study, the Pearson Product Moment Correlation was used. The study sought to answer the following:

1. How well do Thai upper secondary students perform in a PISA English reading comprehension test?
2. How many English words do Thai upper secondary students know?
3. Is there a significant correlation between the vocabulary size and reading comprehension performance of 12th grade Thai EFL learners?
4. How does vocabulary size relate to the following reading comprehension skills:
 - 4.1. retrieving information?
 - 4.2. interpreting texts?
 - 4.3. reflecting and evaluating?

Based on the above research questions and as supported by the research literature, the following hypothesis was formulated:

H_1 = There is a significant positive correlation between the vocabulary size and reading comprehension performance of 12th grade Thai EFL students.

4. 1. Research Finding of Objective 1

As respectively mentioned, one of the dependent variables of this study is the reading comprehension performance score, which includes the comprehension scores from four different reading texts that include reading comprehension skills; *Retrieving Information (RI)*, *Interpreting Text (IT)*, *Reflecting and Evaluating (RE)*. There were 18 questions to be answered by the subjects with a total score of 30 points. The scores obtained for reading ranged from 0 to 29 respectively as shown in Table 5.

Table 5. *Descriptive Statistics for Reading Comprehension Performance*

Reading Comprehension	N	Range		M	SD
		Lowest	Highest		
Total=30	140	0	29	13.99	6.87
RI=11		0	11	4.55	3.64
IT=13		0	12	6.16	2.96
RE=6		0	6	3.28	1.48
Valid N (list wise)					

Figure 4 shows subjects' performance on the three separate reading comprehension skills tests as assessed by PISA: Retrieving Information (RI) with a score of 41%, Interpreting Text (IT) with a score of 47%, and Reflecting and Evaluating (RE) with a score of 55%. The result of the reading comprehension test shows that students have performed well on reflecting and evaluating (RE) with the highest score among the three reading skills.

Despite this, a substantive approach is necessary to improve the results of the *Retrieving Information* and for interpreting passages of a text. In fact, it appears from the data that the ability of students to locate and recognize common segments of a passage seems to

be a challenging task for the majority of learners, while, the capacity of these same students to identify a relationship between each reading segment may also have an impeding effect on their ability to be mindful of distinctive details which may assist learners to select relevant details from the reading segment.

On the other hand, interpreting the text also had a low score of 47%, which might be understood as learners being challenged on tasks that require an in-depth discovery of certain main themes which ultimately result in a blurring of ideas illustrated throughout. Furthermore, this could also have had a negative effect on the ability of learners to compare, contrast or categorize tasks in a way that assist them in making lexical inferences, or, managing competing details within the text. As such, the selection of appropriate ideas could have been difficult for the learners. In particular, when competing details are present, the ability of learners to identify the main ideas within the context of the passage becomes blurred, meaning the capacity of the learner to construe the context within the passage is greatly challenged. Coupled with the learners' familiarity towards the reading topic, and the need to understand the author's chosen topic; thus, the implication is that there is a necessity for students to understand the relationship between words or phrases, which could have ultimately brought about the low overall score.

Despite this, Reflecting and Evaluating received a 55% score which illustrates the ability of students to make appropriate connections within the context of the reading passage and to demonstrate their ability to focus on familiar contexts so that they could explain unfamiliar segments. The majority of students were able to identify and evaluate certain key parts of a reading passage, while also demonstrating the relationship between various ideas within the context of one single main theme.

Overall, since the use of the PISA reading literacy lexicon was utilized, it is

important to be mindful of the various reading variables, namely, the *situation* in which the reader is presented with the reading passage, the *format* in which the reading passage is structured, and the *process* in which the reader approaches the reading text. As a result, these PISA variables could have had implicated the overall results of this study.

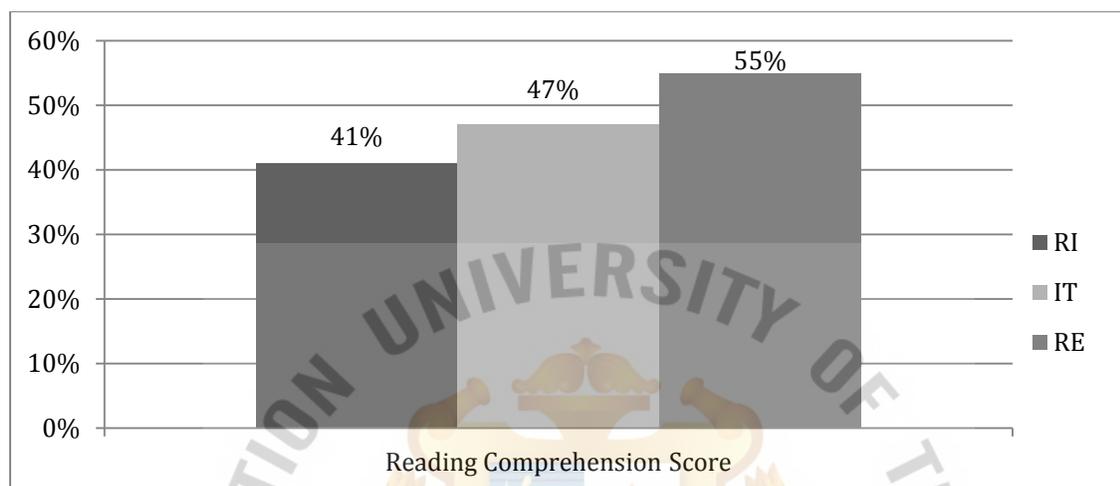


Figure 4. Students' Reading Comprehension Performance Scores on the three (PISA) reading skills.

4. 2. Research Finding of Objective 2

Another dependent variable of this study is vocabulary size. As mentioned in the previous chapter, this variable was measured by VLT tests (Nation 1990). Figure 5 shows the mean scores by level of frequency/AWL, while Table 5 illustrates the mean and standard deviations of the vocabulary level tests. It also shows the mean scores for each VLT word level (2000k, 3000k, 5000k) and AWL. All subjects (N= 140) took the 2000, 3000, 5000, and AWL word level test. The overall mean score of all subjects on 2000k of the test was 17.69 (s.d. 7.33). The mean score for 3000k was 15.69 (s.d. 6.65). The mean score for 5000k and AWL were 12.83 (s.d. 6.59) and 12.69 (s.d. 6.97) respectively.

An inadequate size of vocabulary has a flow on effect with reading

comprehension, and since vocabulary size is an important factor that improves the ability of a student to develop their reading comprehension, it is widely accepted that there is a relationship between vocabulary size and reading comprehension. In fact, studies have suggested that students with a large vocabulary size are often more capable in a wide variety of other language tasks than students who have a smaller range of vocabulary size. This implies that there should be a regulated vocabulary threshold for reading comprehension and that the amount of vocabulary necessary should be upheld, for, without such a threshold there is likely an inability on the part of the learner to grasp the required comprehension to develop their reading comprehension skills.

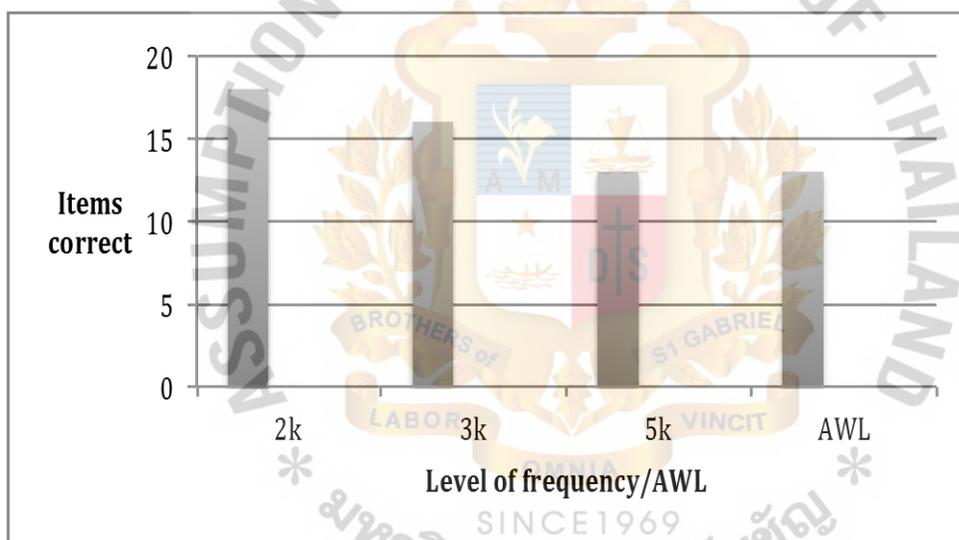


Figure 5. Vocabulary Levels Tests mean scores at 2K, 3K, 5K and AWL

In response to the second research question, "How many English words do Thai upper secondary students know?", descriptive statistics were calculated to examine the results of the vocabulary test. Table 5 illustrates the overall mean and standard deviation of the VLT scores. The highest scores for 2k, 3k, and 5k is 30.0 and AWL is 29.0 while the lowest scores for 2k, 3k, 5k and AWL is 1.0, 2.0, 1.0 and 0.0 respectively. Although a few students were able to respond to the 30 items correctly, some students were able to answer 1 item correctly

while others were unable to correctly answer, as can be seen in Table 6. The large standard deviations also confirm the wide distribution of scores at each level/AWL. Therefore, the majority of 12th grade Thai EFL learners know most of the first 2000 English words and most of the first 3000 words. More than half of the subjects also know most of the first 5000 English words and most of the words of the Academic Word List (AWL).

Table 6. Mean scores, range and standard deviation for Vocabulary Levels Tests

VLT	N	Lowest	Highest	M	SD
2000K	140	1	30	17.69	7.33
3000K		2	30	15.69	6.65
5000K		1	30	12.83	6.59
AWL		0	29	12.69	6.97
Valid N (list wise)					

4.3. Research Finding of Objective 3

With regards to the third research question, the researcher explored the relationship between vocabulary size and reading comprehension, a correlation test involving these variables was run. A two-tailed Pearson Product Moment correlation analysis was conducted and the reading comprehension scores were correlated with subjects' scores on vocabulary size. A positive correlation between vocabulary size 2000K and overall reading comprehension ($r=.750$, $n= 140$, $p=.000$) was obtained. Similarly, positive correlations were found between vocabulary size at 3000K, 5000K, and AWL levels and overall reading comprehension ($r= .680$, $n= 140$, $p= .000$), ($r= .624$, $p=.000$), ($r=.672$, $n=140$, $p=.000$) respectively. On the following pages, Table 7, Table 8, Table 9 and Table 10 illustrates the correlations among students' vocabulary size at 2000K, 3000K, 5000K levels and AWL scores and reading comprehension scores respectively.

Table 7. *Correlation between reading comprehension and 2000K Vocabulary Level*

		2K	TOTAL
2K	Pearson Correlation	1	.750**
	Sig. (2-tailed)		.000
	N	140	140
TOTAL	Pearson Correlation	.750**	1
	Sig. (2-tailed)	.000	
	N	140	140

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

Table 7 has illustrated that the correlation between reading comprehension and the 2000K vocabulary level was significantly linked at the $p < 0.01$ level since Sig. was .000.

Table 8. *Correlation between reading comprehension and 3000K Vocabulary Level*

		3K	TOTAL
3K	Pearson Correlation	1	.680**
	Sig. (2-tailed)		.000
	N	140	140
TOTAL	Pearson Correlation	.680**	1
	Sig. (2-tailed)	.000	
	N	140	140

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

Table 8 has illustrated that the correlation between reading comprehension and the 3000K vocabulary level was significantly linked at the $p < 0.01$ level since Sig. was .000.

Table 9. *Correlation between reading comprehension and 5000K Vocabulary Level*

		5K	TOTAL
5K	Pearson Correlation	1	.624**
	Sig. (2-tailed)		.000
	N	140	140
TOTAL	Pearson Correlation	.624**	1
	Sig. (2-tailed)	.000	
	N	140	140

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

Table 9 has illustrated that the correlation between reading comprehension and the 5000K vocabulary level was significantly linked at the $p < 0.01$ level since Sig. was .000.

Table 10. *Correlation between reading comprehension and AWL*

		AWL	TOTAL
TOTAL	Pearson Correlation	1	.672**
	Sig. (2-tailed)		.000
	N	140	140
AWL	Pearson Correlation	.672**	1
	Sig. (2-tailed)	.000	
	N	140	140

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

Table 10 has illustrated that the correlation between reading comprehension and AWL, which demonstrated that there it was significantly linked at the $p < 0.01$ level since Sig. was .000.

Overall, the results revealed that all of the correlation coefficients are statistically significant at $p < 0.01$ level. This indicates that a linear relationship exists between vocabulary size and reading comprehension (i.e. the higher the scores in the vocabulary test, the higher the scores in the reading test).

The implications of this research question illustrates the readiness of the learner to effectively comprehend the reading task by both *reading* and *thinking*. When reading is impaired by the learners' low vocabulary size, their thinking on the main theme or main ideas within the reading passage becomes distant. The suggested result is that there is a negative possibility between *literal* comprehension, *inferential* comprehension, and *critical* comprehension. Since studies have suggested that literal comprehension refers to the actual understanding of the words as defined in an accepted dictionary, inferential comprehension refers to grasping the unspoken or implied meaning, as distinct from the literal meaning. Critical comprehension, on the other hand, refers to the readers' ability to read beyond the reading passage to the possible implications of the written text. Therefore, the results show that there was a positive correlation between vocabulary size and reading comprehension performance and that reading and thinking go hand-in-hand.

4. 4. Research Finding of Objective 4

To answer the fourth question, "How does vocabulary size relate to the reading comprehension skills: *Retrieving information (RI)*, *Interpreting texts (IT)*, and *Reflecting and Evaluating (RE)*?", a correlational analysis was conducted to analyze the relationships between these three separate reading skills scores and vocabulary size. Table 11 illustrates that the analysis of the relationships among students' scores for each reading comprehension skill as assessed by PISA and vocabulary level tests for 2000K, 3000K, 5000K and AWL word level respectively.

The Pearson Product Moment Correlation Coefficient shows that all vocabulary word levels 2000K, 3000K, 5000K and AWL had statistically significant relationship ($P < 0.01$) with all the reading comprehension skills as assessed by PISA. The results of the data demonstrate that of the three levels of PISA, and each of the four levels of vocabulary;

there is a correlation that supports previous studies which suggests that there is a strong relationship between reading comprehension of the learners at the respected school and their vocabulary size as respectively noted. This respective finding suggests that learners achieve higher scores in reading comprehension tests if they also have an appropriate vocabulary size. As a result, this implies that learners who lack a sufficient vocabulary size are likely to experience difficulty in grasping either the literal, inferential, or critical components of a reading passage. Learners who have vocabulary word levels of 2000K, or less, are likely to experience difficulty at the literal level since they are unable to grasp the literal meaning of unfamiliar words. This challenging aspects has a natural flow on effect with the reading comprehension passage overall, since the ability to comprehend the critical aspects of a reading passage depends heavily on the literal and inferential aspects of the words throughout the text. As a result, priority should be placed on expanding the vocabulary size of EFL learners.

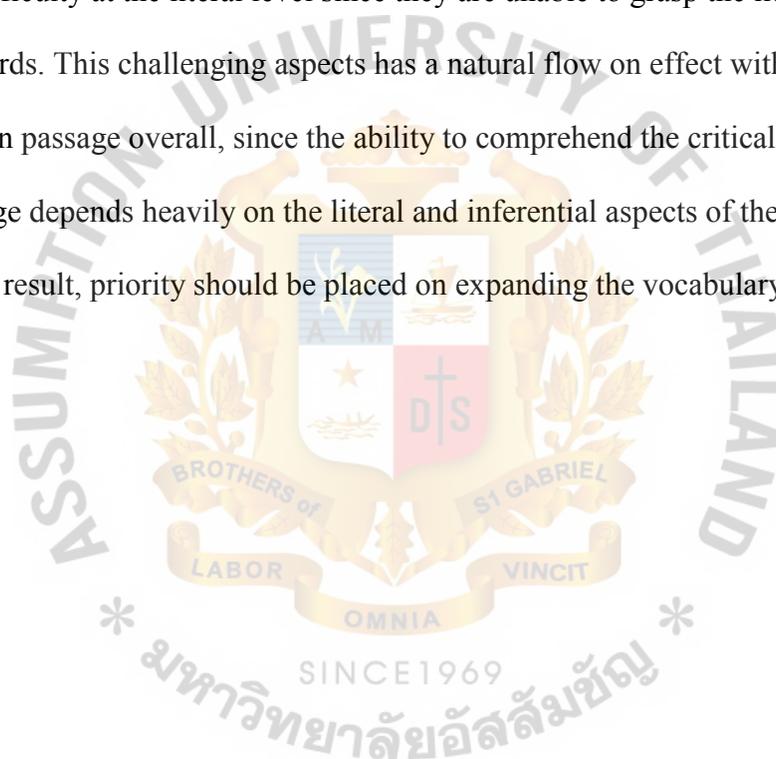


Table 11. *Correlations between the three PISA reading comprehension skills and 2000K, 3000K, 5000K and AWL Vocabulary Level*

	2K	3K	5K	AWL	RI=11	IT=13	RE=6
2K Pearson Correlation Sig. (2-tailed) N	1 140	.850** 0 140	.819** 0 140	.809** 0 140	.712** 0 140	.637** 0 140	.453** 0 140
3K Pearson Correlation Sig. (2-tailed) N		1 140	.859** 0 140	.829** 0 140	.627** 0 140	.613** 0 140	.389** 0 140
5K Pearson Correlation Sig. (2-tailed) N			1 140	.793** 0 140	.559** 0 140	.594** 0 140	.329** 0 140
AWL Pearson Correlation Sig. (2-tailed) N				1 140	.641** 0 140	.563** 0 140	.414** 0 140
RI=11 Pearson Correlation Sig. (2-tailed) N					1 140	.665** 0 140	.456** 0 140
IT=13 Pearson Correlation Sig. (2-tailed) N						1 140	.425** 0 140
RE=6 Pearson Correlation Sig. (2-tailed) N							1 140

** . Correlation is significant at the $p < 0.01$ level (2-tailed).

CHAPTER V

DISCUSSION, RECOMMENDATIONS, AND CONCLUSION

This chapter contains a summary of the four previous chapters, a discussion of the conclusions drawn from the study, and the recommendations of this study.

The research objectives of this study were the following:

- 1) To identify the reading comprehension performance of 12th grade Thai EFL students.
- 2) To determine the English vocabulary size of 12th grade Thai EFL students.
- 3) To examine if there is any relationship between vocabulary size and reading comprehension performance of 12th grade students at a secondary school in Bangkok.
- 4) To determine whether students' vocabulary size relates to the following reading skills as represented in the PISA reading test:
 - 4.1) *retrieving information,*
 - 4.2) *interpreting texts and*
 - 4.3) *reflecting and evaluating.*

A directional hypothesis was formulated: $H_1 =$ There is a significantly positive correlation between reading comprehension performance and the vocabulary size of 12th grade Thai EFL students and tested. Thus, the research hypothesis was confirmed.

It is important to restate that the results of this study revealed that all of the correlation coefficients were statistically significant at $p < 0.01$ level. This indicated that a linear relationship exists between vocabulary size and reading comprehension (i.e. the higher the scores in the vocabulary test, the higher the scores in the reading test).

This study was driven by four research questions reiterated and answered below:

1. *How well do Thai upper secondary students perform in a standard PISA English reading comprehension test?*

Although students' reading comprehension performance has not reached 50% of the minimum requirement as set, based on Pramandanijanukroah School curriculum, it is implied that they performed satisfactorily in the PISA reading test based on the mean score of 13.99. It is also interesting to note that some students have performed quite well based on the large standard deviation (6.87), which indicated that many candidates' scores were higher than the mean.

2. *How many English words do Thai upper secondary students know?*

Of the 140 students, 89 (63.57%) of 12th grade EFL learners know most of the first 2000 English words and 73 (52.14%) know most of the first 3000 words. Moreover, 54 (38.57%) of the students also know most of the first 5000 English words and 58 (41.43%) know most of the words of the Academic Word List (AWL).

3. *Is there a significant correlation between vocabulary size and reading comprehension performance of 12th grade Thai EFL learners?*

A significant positive correlation between vocabulary size 2000K ($r=.750$, $n=140$, $p=.000$) 3000K ($r=.680$, $n=140$, $p=.000$), 5000K ($r=.624$, $p=.000$), and AWL levels ($r=.672$, $n=140$, $p=.000$) and overall reading comprehension were found.

4. *How does vocabulary size relate to the following reading comprehension skills, as assessed by PISA;*

- 4.1. Retrieving information?
- 4.2. Interpreting texts?
- 4.3 Reflecting and evaluating?

The Pearson product moment correlation coefficient confirms that all vocabulary word levels at 2000K, 3000K, 5000K and AWL had statistically significant relationship ($p < 0.01$) with all the reading comprehension skills as assessed by PISA.

5. 1. Discussion

When the relationship between vocabulary size and reading comprehension was examined, a significant positive correlation ($r = .750$, $n = 140$, $p = .000$) was found between overall reading comprehension scores and the 2000-word vocabulary level. Similarly, positive correlations were found between vocabulary size at 3000K, 5000K, and AWL levels and overall reading comprehension ($r = .680$, $n = 140$, $p = .000$), ($r = .624$, $p = .000$), ($r = .672$, $n = 140$, $p = .000$) respectively.

The findings revealed that 89 (63.57%) of grade 12th Thai EFL learners knew most of the first 2000 English words and 73 (52.14%) knew most of the first 3000 words. Moreover, 54 (38.57%) of the subjects also knew most of the first 5000 English words and 58 (41.43%) knew most of the words of the Academic Word List (AWL). This finding was in line with Nation's (2001) recommendation, in which it was suggested that knowing the most common 2000 English words and academic vocabulary (e.g., Coxhead list) could provide 90% coverage of academic texts.

Furthermore, the results of the Pearson Correlation Coefficient showed that there was a significant positive correlation between vocabulary size and reading comprehension performance of grade 12th Thai EFL learners, which is congruent with previous studies by Laufer (1989) and Nation (2001), who both suggested that with a vocabulary size of 2000 words a learner should know approximately 80% of the words in the text, which is sufficient to allow adequate comprehension of a text. Another study conducted by Staehr (2008) on 88 EFL learners revealed that learners' receptive vocabulary size is strongly related to their

reading and writing skills, suggesting that a 2000-word vocabulary level is an important achievement for EFL learners particularly for low-level EFL learners.

However, Nation (2006) proposed that 3,000 word families and proper nouns will give a lexical coverage of around 95 percent, which could provide sufficient understanding. In this study, it was interesting to note that the majority of 12th grade EFL learners knew most of the first 2000 words and most of the first 3000 words, while more than half of the subjects also knew most of the first 5000 words as well as most of the words of the Academic Word List (AWL). This could possibly imply that most of the students were more exposed to academic texts. It was also worth mentioning here, that students in Pramandanijanukroah School start to have vocabulary recitation at 1st grade to 12th grade every day before the class begins. Thus, the level of their knowledge of vocabulary may be better than any other schools in the area. In one study conducted by Zhang and Anual (2008), for example, the role of vocabulary knowledge in secondary Singaporean learners' reading performance was examined. The Vocabulary Size Test was utilized to measure learners' vocabulary knowledge. The results of this study revealed that having 2000-word and 3000-word levels of vocabulary knowledge was significantly correlated with their reading scores.

Another significant relationship was obtained between vocabulary size and reading performance in the present study. Interestingly, in a PISA reading comprehension test some students performed quite well based on the large standard deviation (6.87), which indicated that many candidates' scores were higher than the mean. It was also important to note the subjects' performance on the three separate reading comprehension skills tests as assessed by PISA: *Retrieving Information (RI)* with a score of 41%, *Interpreting Text (IT)* with a score of 47%, and *Reflecting and Evaluating (RE)* with a score of 55%. The result of the reading comprehension test showed that students performed well on reflecting and evaluating (RE) with the highest score among the three reading skills. It could be implied that

the reading texts used in PISA were less traditional in nature than many other examination reading texts due to their short length and the inclusion of charts and other illustrations, which might have made the texts less dense in terms of lexical content.

A number of EFL studies have confirmed that there was a significant relationship between vocabulary knowledge and reading comprehension performance. Hence, learners who knew a great amount of vocabulary are actually better readers and that they perform well in the reading comprehension test. The findings can be justified in related literature. Furthermore, many researchers affirm that a learner's vocabulary knowledge can be the best predictor of his comprehension of text (Anderson & Freebody, 1981). Further support for the results of this study was from Li and Kirby (2014) who proposed that vocabulary size had a strong effect on reading performance.

5. 2. Pedagogical Implications

The present study examined the relationship between vocabulary size and reading comprehension of grade 12th Thai EFL learners. Results have shown a significant positive correlation between vocabulary size and reading comprehension, in fact, it could be implied that the level of comprehension is exceeded by the lexical threshold. For this reason, the following suggestions are provided:

1. This study has found that teachers should be well prepared and knowledgeable in a wide range of modern EFL techniques so that a variety of a students might achieve a satisfactory threshold of vocabulary as well as a sufficient level of reading comprehension. In fact, this study found that 63.57 percent of students had, overall, a vocabulary size of 2000 English words. It is reasonable to suggest that sufficient comprehension for high school students is possible for the 2000 English vocabulary size, but further work by the EFL teacher in garnering support is necessary in order to

engage students in a higher level of vocabulary thresholds necessary for advanced learning within an EFL context. However, this implies that, as lexical development improves, greater support must also be offered to the quality of reading skills to L2 learners as well since vocabulary size is a particular means in which to develop reading comprehension. As this study has found, illustrates a positive relationship between vocabulary size and reading comprehension that suggests the need to consistently ensure that L2 learners are not singularly helped to improve their vocabulary without the appropriate support to also develop their reading comprehension (which may require more than just the understanding of inferential, literal and critical skills). As such, modern EFL techniques are needed, but it is implied that these should be viewed in light of developing the three skills for better reading comprehension (rather than just for the sake of increasing L2 learner's vocabulary size).

2. This research has implied that the utilization of material is essential for learners, therefore teachers should be effective in creating appropriate material that supports student learning since both teaching and learning is a process. Needless to mention, learners appear to be mindful of the need to increase the size of their vocabulary and that they are aware of the relationship between both the vocabulary size and reading comprehension as being positively correlated, however, this requires the ongoing support of the teacher to appropriately identify areas of engagement with EFL students so that critical thinking skills are also developed in the area of contextual analysis. Since the literature review has identified that reading comprehension may greatly improve as vocabulary size increases, so too must teachers be aware of the same relationship. For instance, the use of appropriate materials to support EFL learners in their language acquisition with particular emphasis on reading

comprehension and vocabulary is a necessity. It is not sufficient to have learners improve simply by merely having them analyse extensive reading tasks, instead, EFL learners should be supported with material that is unique to their interests and character as an individual. Since high school curriculums are frequently mandated to cover particular topics over a very limited period of time, it is well recognized that teachers have a justifiably difficult time trying to incorporate tasks that are motivating to each particular learner. However, as this literature review has suggested, reading comprehension is positively related to reading; thus, teachers carry a responsibility to ensure they are ethically engaging students in learning material that effectively improves learner skills – whether or not the time is sufficient. As a result, the implications of this study suggests that teachers utilize 21st century technology to motivate and engage EFL learners in a variety of ways. For instance, since this study has found that the lexical threshold has been identified as a major component to supporting reading comprehension, maximizing time both during class and as part of the extra-curricular or co-curricular programs is a positive steps toward utilizing 21st century learning material. However, it is not effective enough simply to incorporate modern technology into the EFL curriculum as a means to support EFL learning acquisition, instead, it is implied in this study that learning material is only one means to garnering sufficient means to producing greater EFL reading comprehension and increasing vocabulary size. Instead, this study has suggested that teachers might also look at expanding their understanding of character motivation to support the learning material that is utilized within the existing EFL curriculum.

3. While this research has found that L2 vocabulary is considered new and different from the perspective of the learner, age plays a significant role in grasping a variety of new vocabulary. For this reason, teachers should be mindful of this aspect. As such,

these findings have suggested that L2 vocabulary learning strategies might be based on the English learning ability of the student and, furthermore, learning strategies could be broken down into several parts so that the particular learning strategy appears more beneficial to the learner. In addition, since age plays a role in establishing a wider vocabulary size, which might be due to the role of autonomous learning, it is suggested here that teachers provide greater direction to younger learners as opposed to older learners, in order to support growing their L2 vocabulary. For instance, many learners may dislike learning new vocabulary words through conversational English due to certain factors (such as shyness, or a lack of confidence), but nevertheless are able to grasp the meaning of words and use them in a variety of inferential, literal and critical circumstances. In such a case, it is necessary on the part of the teacher to engage these L2 learners in a variety of tasks that produce a more confident L2 learner.

4. It was also implied by the findings in this study that it is important for teachers' to understand their learners' capabilities and attributes, in order to create an effective lesson plan that engages student learning sufficiently. For instance, by sourcing out quality material that encourages the acquisition of appropriate vocabulary, or the engagement of team-based/classroom based tasks and the incorporation of a wide variety of learning strategies. For instance, some research has suggested that some groups of L2 learners are able to comprehend just as much through conversational English or communicating with one another, while others might be able to grasp new words and increase their vocabulary size by watching television programs or movies that are engaging to that particular learner. On the other hand, studies have suggested that some EFL learners are just as much capable of increasing their vocabulary size through writing as a means to memorize words and their apparent contextual usage,

while some might use dictation as a means to practice the use of new words. It is undeniable, especially in Thailand, that EFL learning with native English speakers is the much preferred means of communicating to increase English proficiency, and this is also the case with increasing vocabulary size since learners are able to place the context of an unknown word in a natural manner while also becoming accustomed to the realistic approach of how new words are commonly presented to others. As a result, the sourcing out of effective material with support from native English speakers is highly beneficial to L2 learners, while an understanding of incorporating appropriate team-based or classroom-based tasks may assist in improving the rate in which learners actively increase their vocabulary threshold.

5. 3. Limitations

This study had recommended that there is a minimum number of words required to meet a comprehensive level of reading capability which has led to a lexical threshold. By not meeting this minimum number of required vocabulary, learners would not be able to meet a sufficient level of understanding to grasp the contents of a reading passage. Furthermore, they should achieve a minimal threshold so that other factors (like L1 or background information) might be sufficiently understood. Although the results of this study should not be generalized, it is recommended that future studies should be conducted so that validation could occur in the following areas:

1. This study focused exclusively on vocabulary size and reading comprehension performance. The vocabulary test included only one measure of the subjects' vocabulary size, Nation's (1990) Vocabulary Levels Test (VLT) and there was no assessment of the subjects' wider vocabulary knowledge (e.g. collocation, pronunciation, spelling, etc.). It measured only written receptive vocabulary

knowledge, as required for L2 reading. The reading comprehension test utilized only four different short reading texts from PISA 2009.

2. The size and nature of the sample. The subjects who participated in this study were 140 subjects all from the same institution, which is a private Catholic school, the majority of whose students' progress to higher education, so may not be typical of secondary schools in Bangkok.
3. The present study allowed estimates of the vocabulary size of Thai EFL learners at the secondary level. However, it is beyond the scope of the present study to discuss any particular vocabulary acquisition problems that might be perceived by EFL learners in Thailand.
4. The present study utilized quantitative methods in examining EFL learners' vocabulary size and reading comprehension. The results of the present study, therefore, are not based on any investigation of the reading strategies employed by EFL learners in Thailand. Nevertheless, due to the absence of previous statistics about the learners' vocabulary size and reading comprehension, the present study may surface the way for future qualitative studies, and deepen the understanding of foreign language educators in Thailand of their students' reading problems and needs.
5. This differences in test scores and the level of vocabulary knowledge or topic familiarity were not taken into account, as such, the validation of the reading comprehension tests was a limitation. Furthermore, certain questions throughout – namely, the open ended questions – may have led to discrepancies which could have been avoided (e.g. unfamiliarity with the text or passage). This could have threatened external validity.

6. Finally, the test was administered at the last period of the class, so some subjects were stressed, tired and wanted to go back home. Thus, they might not have performed as well on the test as they could have.
7. Since this study utilized a correlational approach, the determination of whether an increase or decrease arose as a result of another variable is the only identifiable finding that could be suggested. This means that other factors may have played a role, for instance, low scores might not have affected the correlation.

5. 4. Recommendations

The study with its focus on authentic reading and the importance of the vocabulary size may help reform the manner and technique of providing EFL instruction within the Thai system of education. It is recommended that more research be undertaken to re-investigate or re-examine the relationship between vocabulary size and reading comprehension in other secondary schools and among students learning in different grade levels and programs. Re-examining the ability of EFL students to achieve adequate outcomes in such skills as reading and vocabulary could be investigated, while, the data received from either the reading tests or vocabulary examinations might be used to associate frequencies of words and patterns. Finally, this study might support the development of EFL programs in a variety of Thai schools either through the improvement of such courses, but specifically, their ability to read adequately and enhance their vocabulary size; ultimately leading to academic growth.

Since the study will provide estimates of the EFL learners' vocabulary size and reading ability, the findings will help determine the reading and vocabulary needs of EFL learners in Thailand. Addressing such needs will not only help these learners succeed in their language learning, but also in their academic and professional future.

For Parents:

- EFL teachers are recommended to engage more with parents at home, since it is well-known that parents are first and foremost the primary educators of a child, it is acceptable to note that the parents should take more responsibility in the education of their child. Since most time is spent at home, it is reasonable to request that parents encourage greater EFL mediums be used to support their child's learning. For instance, watching news segments at home in English may engage or inspire the learner's grasp of new vocabulary, while, reading English language books on fictional characters that are attractive to the learner may help to place particular words within a suitable context for which the learner could replicate later on in the classroom. All in all, EFL emersion at home is likely to support their vocabulary size and develop their reading comprehension, thus, it is recommended that teachers take an active role in engaging parents more to encourage EFL use at home.

For Teachers:

- To support EFL learner's language acquisition, teachers are recommended to incorporate modern technology and software into the curriculum as part of the learning process. For instance, this might involve the use of YouTube videos to help learners expand a particular area of English, for example, learners who require development of their social words might be directed to watch approved videos on YouTube that focus on this category of words. Alternatively, learners might be suggested to engage in activities that they enjoy, but with manageable or measurable means of increasing their vocabulary size. For instance, teachers who would like learners to expand their use of English words for biology might suggest that learners take daily pictures of a, say, plant to describe the progress of photosynthesis which might then be uploaded to their social media account,

with a short paragraph describing what is happening in the picture. The teacher might then use the *comments* function to provide *feedback* on the description. As a result, social media accounts (for example, Instagram) might be a reasonable way of both communicating ideas and thoughts by acquiring new words and assist in being able to use these words within a familiar and modern context. Furthermore, it offers EFL learners a practical way of doing small projects or assignments that engage them openly within the learning community that might be shared with all other learners in the classroom, thus, all other learners are able to share in the benefits of the same task as well as the *feedback* offered in the *comment* by the teacher.

- Research completed over the past decades, which have been identified in the literature review, recognise the need to utilize appropriate strategies for improving vocabulary size. It is recommended that memory strategies are incorporated into lesson planning of EFL teachers so that learners might benefit from external class activities that might provide an opportunity for the learner to increase their vocabulary size. For instance, teaching students how to use memory strategies might support their development of vocabulary size at home, such as identifying the different ways of categorizing a street as ‘road’, ‘avenue’, ‘alley’, ‘drive’, ‘street’, ‘boulevard’, ‘carriageway’ etc. In such circumstances, learners may know a limited number of synonyms for the word *street*, but through memory strategies and daily life, viewing different street signs may support their capacity to increase their vocabulary size.
- It is recommended that EFL teachers develop further their understanding and use of *cognitive* strategies within the classroom setting in order to improve reading comprehension skills once vocabulary size has been sufficiently developed. This recommendation may also encourage a deeper understanding of the information, and as such, encourage further reading analysis rather than simply a literal or inferential

understanding. Since students ultimately require English test preparation skills to study later on, it is naturally important to prepare students effectively for their future. To do so, cognitive strategies such as skimming a reading passage, then going back to analyse the various literal, inferential and critical text encourage greater utilization of instructional time. EFL learners who utilize these strategies may improve their vocabulary size while also developing their reading comprehension, since reading tasks may also require the learner to summarize their inferences by writing a short descriptive paragraph of the reading passage, or by communicating verbally their understanding of the text to the teacher. This may ultimately encourage EFL learners to develop their critical reading skills.

- EFL teachers are encouraged to assist learners in trying to compensate for unknown words by developing learners' overall understanding of a paragraph within a reading passage. *Compensation* strategies support learners who have a very low vocabulary size, but this does not mean that they are unable to grasp the overall meaning or context of a reading passage. It is well-known that unknown words might be successfully guessed using the words around the unknown word itself, and so compensation for this discrepancy could be catered to by the teacher. EFL teachers are recommended to incorporate compensation strategies as a means to support students who have difficulty increasing their vocabulary range for a variety of reasons.
- EFL teachers are encouraged to direct learners to be more self-monitoring of their own learning, as well as to self-manage and self-evaluate their goals in order for them to take greater responsibility for their own learning. Learners may feel left out when they have inadequate assistance in framing such goals, therefore it is also recommended that the learners are supported in this task by their teachers to identify weekly or fortnightly milestones that help them to incrementally develop their vocabulary size. Students might

become better autonomous learners through their own self-management or self-evaluation of their learning, which could be done by encouraging EFL learners to read every day, to learn the roots of new words, by encouraging the use of a thesaurus and developing a more practice use of vocabulary that might be incorporated in a clearer manner. By learning new words each day, learners are able to grow their vocabulary size over a specified period of time, and this could be done by looking up the meaning of new words in a dictionary, or keeping a journal to establish the correct use of that word within a particular context. Teachers are also suggested to make use of word puzzles or board games as well, which might boost the size of new words in an attractive way for young learners. Successful students may then demonstrate two positive repercussions as a result of this, first, they take greater responsibility for their own autonomous learning through self-management and evaluation, while also achieving EFL curriculums goals through their chosen milestones.

- EFL teachers are recommended to provide rewards to learners who achieve their respective milestones, for example, those who are able to increase their fortnightly milestones might receive a classroom certificate to show their parents how hard they have worked. This additional praise by their parents might be sufficient for those who lack confidence or support at home, thus a certificate or reward might be an encouraging factor to developing a more engaging EFL curriculum.

For Students:

- Diversifying the reading list to suit the interests of the learner will help to expose a wider variety of vocabulary words that may spur in the learner a desire to autonomously seek out the meaning of these new words. This desire on the part of the learner may encourage greater intake and better understanding of the word itself, both its meaning as

well as the manner in which it is frequently used in reading passages.

- Autonomous learning is a key component of individuality, and becoming more responsible towards one's own education is a fundamental factor to becoming a more civilized individual within a functioning society. Students are recommended to experiment with multiple learning strategies to find one that best suits their own character, while also being mindful of their own factors that support their own motivation.
- In addition to drawing form, and making appropriate comparison between texts, it is recommended that students integrate previous knowledge in order to grasp the full meaning of a reading passage.
- Furthermore, students are suggested to read a variety of different texts in order to progress with unfamiliar words more effectively.
- Short breaks are suggested for learners so they might refresh their perspective about a reading passage, thus, comprehension may become more enjoyable and productive.

Students are also encouraged:

- to identify the purpose for their reading
- to skim texts for a literal understanding of the reading passage
- to preview abstracts where available, so that the overall understanding of the reading passage might be inferred
- to make predictions if possible in order to verify understanding of a reading passage
- to summarize reading passages so that other perspectives might be identified

For Educational Administrators/School:

- In order to improve the development of lexical acquisition through vocabulary size, it is recommended that educational administrators of the school's EFL program incorporate a systematic framework with a specific aim to improving lexical development. This may assist teachers in utilizing their time most effectively in the classroom, so that better results might be achieved.
- Offering an inclusive classroom context that supports intentional reading and reading for actual practice use supports a strong instructional program. Educational administrators are suggested to supervise classroom EFL instruction so that effective measures could be implemented to develop compelling and directed goals that achieve the overall school purpose.
- In addition, it is recommended that educational administrators build a comprehensive curriculum that assist in improving the learners' comprehension of various texts throughout the school, as such, an effective strategy should be taken on board by all school stakeholders, but spearheaded by the school principal.

Education administrators are also recommended to:

- Ensure that lesson plans integrate a specific, yet concise, description of what strategies will be implemented and how it should be utilized during the lesson. This should also identify the expected outcomes for student learning.
- Model effective EFL strategies that have been implemented throughout the school
- Collaborative opportunities should also exist between teachers of the EFL departments so that useful teaching strategies might be communicated for maximal utilization.

For Future Researchers:

- Future researchers are suggested to complete a mixed method study with a larger sample size in order to verify the results of this study. A mixed method study may support greater understanding of how and why certain actions might be performed as a result of the implications of the study, furthermore, incorporating both quantitative and qualitative questions within the questionnaire may encourage deeper responses that could be beneficial to other stakeholders (for example, the school principal or head of the EFL department).

5. 5. Conclusion

The main purpose of this study was to examine the relationship between vocabulary size and reading comprehension performance of grade 12th Thai EFL learners. To accomplish this goal, a total of 140 subjects consisting of 56 males and 84 females with age ranges from 17 to 18 years who are enrolled in the first semester in the academic year 2018 were chosen. Two tests were utilized, the first was the Vocabulary Levels Tests 2000K, 3000K, 5000K and AWL (Nation 1990) and the second was the Reading Comprehension Test (PISA 2009), the former is to measure the subjects' vocabulary size and the latter to assess their reading comprehension performance.

Although the sample size and the incorporation of correlation statistics challenge the generalizability of the findings of this research, a variety of implications were discovered in this research study – which might be utilized in a range of schools that have a similar EFL situation with learners. In particular, it was identified in this study that EFL learners generally have a minimum vocabulary threshold of 2000 words, and that this was essential to reading comprehension, while exposure to this vocabulary threshold supported greater development in other skills such as literal, inferential, and critical reading skills. In addition, it was also

noted that although there was a link between vocabulary size and reading comprehension, it was vocabulary size that had a positive effect on the development of an EFL learners' reading comprehension skills and not the other way around. This was also a finding identified in the literature review by previous studies, and the result was replicated at the respective school in Bangkok, Thailand. At the same time, it is suggested by this researcher that since grade 12 Thai EFL learners have advanced in their teen years, it was necessary to understand that many of these learners required a suitable vocabulary size so that they might gain entrance into a Thai or foreign university. As a result, it may be the case that pressure to succeed in certain test preparation courses for university entrance had some type of effect on the results of either the VLT or PISA tests in this study.

It is well-known that since the link between vocabulary size and reading performance is significantly correlated, as identified by previous studies in the literature review. However, it is also important to recognise that learners should be sufficiently exposed to a variety of reading passages so that they become accustomed to a variety of written sentence structures, since it might be commonly known that spoken mannerism are distinct from the formal manner of writing. Ultimately, learning strategies have been recommended as a fundamental function to both attaining, retaining and sustaining an adequate vocabulary size to support effective reading comprehension performance. Needless to mention, learners who have a low vocabulary size (or receive low scores in the VLT) also demonstrated to have suffered during the PISA test as well. Thus, vocabulary acquisition is a critical component to understanding the pedagogical implications associated with EFL departments and their success at providing effective instructional programs for EFL learners.

In particular, pedagogical implications might suggest that teachers should encourage a much higher vocabulary size as means to develop critical reading strategies for effective reading comprehension performance. Gradually introducing learners to more and

more vocabulary over a period of each term, sustained by the ongoing introduction of more vocabulary over the period of the next school term, may help to enhance more extensive reading skills and abilities. Since the evaluation and appraising of the VLT is linked to reading comprehension performance, it is appropriate to assume that learners might naturally succeed as a result of this extensive vocabulary range in, grade 12, their last year of high school.

Fundamental to this however is the support, and necessary engagement, of educational administrators as well as the parents of EFL learners. The literature review has illustrated that educational administrators provide the financial and political weight to garnering sufficient support to empower teachers to learn more about effective EFL learning strategies, while also ensuring that an attractive framework is incorporated within the school to ensure that resources are pulled together appropriately for the benefit of the EFL learners, since time management has been identified as a key challenge for many EFL teachers. Furthermore, extracurricular activities at home suggest that autonomous learning and extensive reading can help to improve the vocabulary size and reading comprehension performance of EFL learners. Since reading comprehension performance has been identified in this literature review to also require reflection, and since the sample size measured the results of grade 12 Pramandanijanukroah School students, it is reasonable to propose that inferencing, predicting, contextual clues, skimming and scanning should also be specifically taught by teachers to EFL teachers. It was concluded that the likely implication of this study would be that grade 12 EFL learners would benefit from this by improving their literal, inferential and critical reading skills which might better prepare them for academic learning or their future career. This may ultimately lead to a higher level of intellectual learning at the next stage of higher education, thus increasing the Thai students' reading capability which

enhances the range of scholarly material in which to base the development of theoretical ideas.

It is well known that reading literacy is an essential aspect to a functioning society, to add to this, the PISA reading scales assist in defining a variety of reading comprehension performance levels, the proficiency of a learner to engage at an adequate level of literacy is based primarily on the requirements of the PISA examiner (in this case, the school or this researcher). Oddly, there is no formal PISA benchmark, it can be challenging on a national scale to try and define what constitutes a suitably formal level of proficiency in this test, in particular at each age level. This may have an affect on determining a suitable PISA level that demonstrates an EFL learner's proficiency. The implication of a PISA test used to identify performance of EFL learners might be significant since research has illustrated that reading literacy is a core aspect to the development of a modern democracy. If reading literacy is not considered an important function of a working national democracy, state to state variations are likely to exist much more which may have an effect on the overall literacy achievement and their available research vitality. Since it is commonly known that citizens have a duty to know the law, to understand it and to follow it; it therefore makes sense that reading literacy is the most appropriate means of dispersing legislation to the citizenry. Naturally, there are a multitude of other core functions that vocabulary size and reading comprehension play in terms of creating a collaborative society that engages in economic and social development. Therefore, reading literacy is a fundamental instrument to the effective functioning of a healthy democratic society.

Since this literature review has demonstrated the relationship between vocabulary size tests and reading comprehension, it was also illustrated that the inability to grasp the meaning of words coupled with the challenge of guessing the correct meaning from within the words context had led to difficulties with comprehending reading passages. As a result, a

number of variables could influence the manner in which an EFL learner learns English. For instance, EFL learners might benefit directly from memory strategies or tasks that enhance the range of an EFL learner's vocabulary size. By putting particular emphasis on the memorization of new words, this study has demonstrated that the likely effect is a flow on positive result with reading comprehension performance, that is, as the vocabulary size increases so too do the performance of EFL learners' reading comprehension. It is suggested by this researcher that L2 learners might receive high reading comprehension scores as a direct result of increasing their vocabulary size. This is a finding which was demonstrated in this study as well. The implication of this finding is that L2 learners might better establish their learning time and become more motivated to engage in appropriate activities that develop this specific goal. While it has been established that L2 learners are likely to benefit from increasing their vocabulary size, EFL teachers would be needed to engage their learners in a way that motivates effective accomplishment – without much failure. Since learners might easily lose confidence in their language acquisition abilities, teachers were recommended to identify a wide variety of learning strategies that establish an engaging and effective approach to increasing vocabulary size, for instance, reading extensively was one particular recommendation offered in this study, while other cognitive and memory strategies – for instance - were recommended as part of the process of teaching L2 learners as supported by the literature (Baddeley, 1999). Given the impact that vocabulary size has on reading comprehension performance, educational administrators and EFL teachers should naturally identify the necessary course of action given the flow on effect it has. While the identification of this has recently been demonstrated, teachers also have the responsibility to teach autonomous learning to their EFL learners so that ongoing development could be undertaken without the support of a teacher on hand. Furthermore, the role that parents play in supporting their child's education must not be forgotten once the child returns home. It is commonly

accepted then, that to engage adequately for effective EFL learning, learners, teachers and parents need the help of each other in order to develop the learners' fullest potential. As this literature has seen, learners can understand concepts and respond to different learning strategies in a variety of ways. It is perhaps the duty of both the teachers and parents to assist in the development of the child. While this has been widely accepted, little may have been done to actively engage in such assistance. Despite this, autonomous learning may provide a strong hand in ensuring that EFL learners are capable, and effective, at critically development their reading comprehension skills. It was previously recommended that teachers might empower their EFL learners through incentives for learning, and while it is widely accepted that such rewards act as a motivating factor, the accomplishment of milestones may help to develop extensively the EFL learners' vocabulary size.

It is perhaps obvious that the implication of the role of vocabulary size is essential to effective reading comprehension – more so for grade 12 Thai learners who are likely to head into university entrance examinations within a few months. This implication means that authors of course books, teachers, curriculum development administrators, educational administrators, and the school committee that selects the textbooks for student use should prioritize those learning materials which emphasize the role and development of vocabulary size.

As a result, it might be accepted that changes will need to be instituted within classroom settings and to educational policies so that the full benefits of increasing vocabulary size is realized. Other adjustments to the learning program could include changes to the teaching methodology of EFL programs, adjusting the design of the curriculum, adopting different approaches to EFL assessments, as well as the improvement to EFL teachers' understanding of a wide variety of learning strategies necessary to the better understanding of various learning styles of EFL students.

Could this mean then that EFL learners simply require rote memorization of English words? Not necessarily, and no research is fully exhaustive of all possibilities.

However, taking into consideration the effect of this research within the demographic groups stipulated in Thailand, it is reasonable to assume that similar age learners are likely to benefit in much the same way should vocabulary size take precedence within the classroom setting.

Furthermore, since the study found that all of the correlation coefficients were statistically significant at $p < 0.01$ level. This indicated that a linear relationship existed between vocabulary size and reading comprehension and that the greater the vocabulary size, the greater the likelihood of performing better in the reading comprehension tasks.

Given the implications of this study and the findings, the correlational analysis of the obtained data distinctly affirmed that vocabulary size can be regarded as an essential factor in reading comprehension. Therefore, this study confirmed the previous research conclusions. Despite this, it is suggested that further quantitative studies are conducted in a similar study to investigate the vocabulary size of EFL learners, or whether or not there is a sufficient vocabulary threshold needed for academic study at university level. This may help to guide further development in enhancing vocabulary size as a core area of the EFL lesson plan, while ultimately achieving an overall goal of establishing better reading comprehension performance by Thai grade 12 EFL learners.

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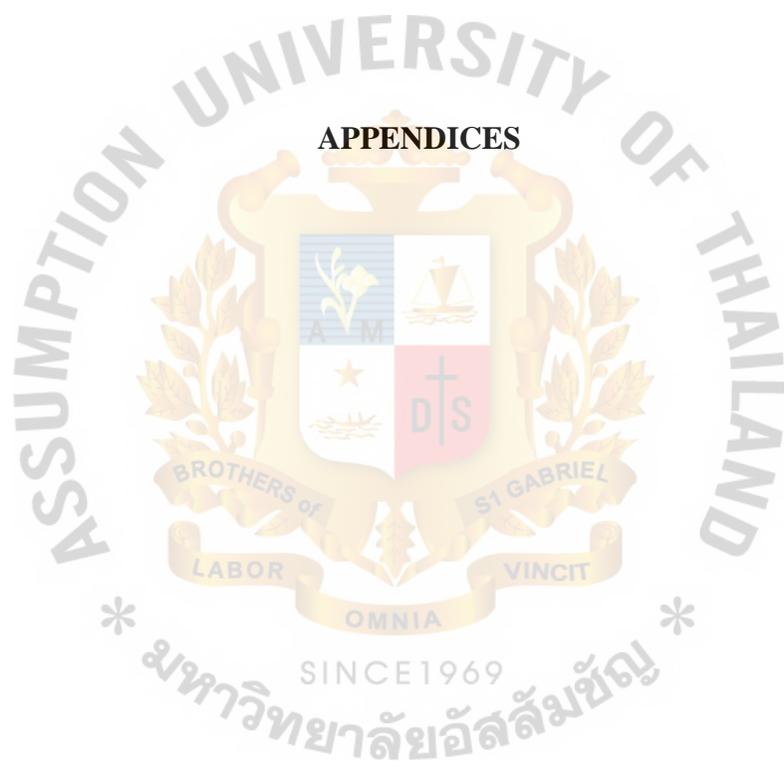
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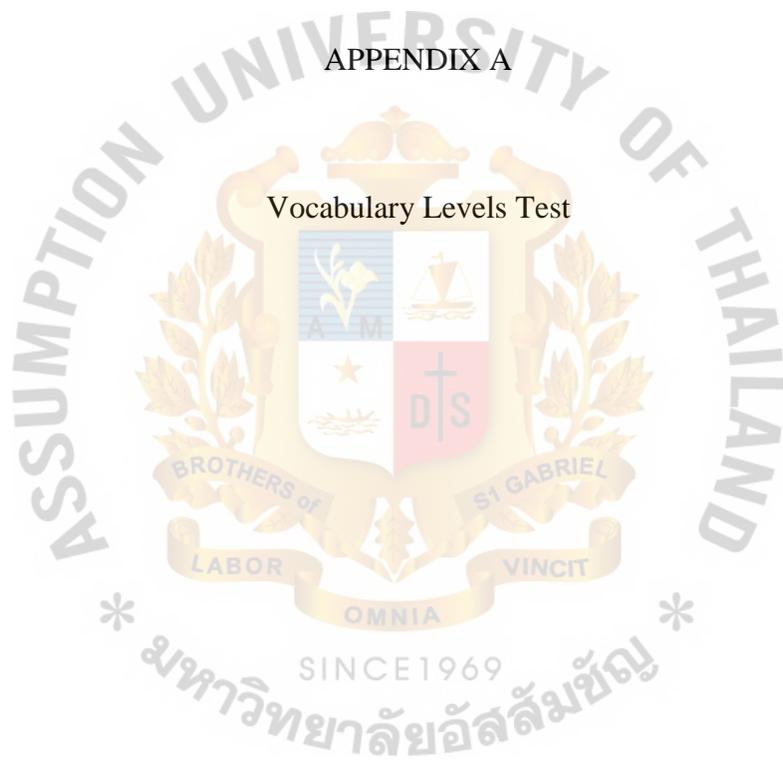
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APPENDICES

APPENDIX A

Vocabulary Levels Test



Name _____ Surname _____ Class _____ No. _____ Score _____

Vocabulary Level Test

Direction: Match the definitions on the right in each cluster with the corresponding words on the left. Write numbers only in the blanks provided.

Version 2 The 2,000-word level

- | | | | |
|---------------|----------------------------------|---------------|-----------------------------------|
| 1 copy | | 1 admire | |
| 2 event | _____ end or highest point | 2 complain | _____ make wider or longer |
| 3 motor | _____ this moves a car | 3 fix | _____ bring in for the first time |
| 4 pity | _____ thing made to be like | 4 hire | _____ have a high opinion of |
| 5 profit | another | 5 introduce | someone |
| 6 tip | | 6 stretch | |
| | | | |
| 1 accident | | 1 arrange | |
| 2 debt | _____ loud deep sound | 2 develop | _____ grow |
| 3 fortune | _____ something you must pay | 3 lean | _____ put in order |
| 4 pride | _____ having a high opinion of | 4 owe | _____ like more than something |
| 5 roar | yourself | 5 prefer | else |
| 6 thread | | 6 seize | |
| | | | |
| 1 coffee | | 1 blame | |
| 2 disease | _____ money for work | 2 elect | _____ make |
| 3 justice | _____ a piece of clothing | 3 jump | _____ choose by voting |
| 4 skirt | _____ using the law in the right | 4 manufacture | _____ become like water |
| 5 stage | way | 5 melt | |
| 6 wage | | 6 threaten | |
| | | | |
| 1 clerk | | 1 ancient | |
| 2 frame | _____ a drink | 2 curious | _____ not easy |
| 3 noise | _____ office worker | 3 difficult | _____ very old |
| 4 respect | _____ unwanted sound | 4 entire | _____ related to God |
| 5 theater | | 5 holy | |
| 6 wine | | 6 social | |
| | | | |
| 1 dozen | | 1 bitter | |
| 2 empire | _____ chance | 2 independent | _____ beautiful |
| 3 gift | _____ twelve | 3 lovely | _____ small |
| 4 opportunity | _____ money paid to the | 4 merry | _____ liked by many people |
| 5 relief | government | 5 popular | |
| 6 tax | | 6 slight | |

Version 2 The 3,000-word level

1 bull		1 abandon	
2 champion	_____ formal and serious manner	2 dwell	_____ live in a place
3 dignity	_____ winner of a sporting event	3 oblige	_____ follow in order to catch
4 hell	_____ building where valuable	4 pursue	_____ leave something
5 museum	objects are shown	5 quote	permanently
6 solution		6 resolve	
1 blanket		1 assemble	
2 contest	_____ holiday	2 attach	_____ look closely
3 generation	_____ good quality	3 peer	_____ stop doing something
4 merit	_____ wool covering used on	4 quit	_____ cry out loudly in fear
5 plot	beds	5 scream	
6 vacation		6 toss	
1 comment		1 drift	
2 gown	_____ long formal dress	2 endure	_____ suffer patiently
3 import	_____ goods from a foreign	3 grasp	_____ join wool threads together
4 nerve	country	4 knit	_____ hold firmly with your hands
5 pasture	_____ part of the body which	5 register	
6 tradition	carries feeling	6 tumble	
1 administration		1 brilliant	
2 angel	_____ group of animals	2 distinct	_____ thin
3 frost	_____ spirit who serves God	3 magic	_____ steady
4 herd	_____ managing business and	4 naked	_____ without clothes
5 fort	affairs	5 slender	
6 pond		6 stable	
1 atmosphere		1 aware	
2 counsel	_____ advice	2 blank	_____ usual
3 factor	_____ a place covered with grass	3 desperate	_____ best or most important
4 hen	_____ female chicken	4 normal	_____ knowing what is happening
5 lawn		5 striking	
6 muscle		6 supreme	

Version 2 The 5,000-word level

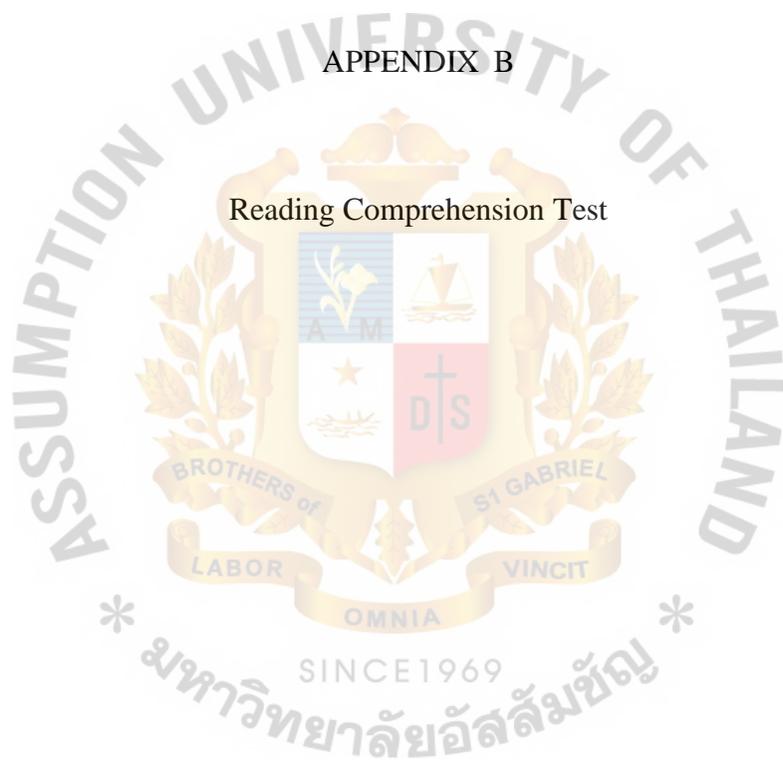
1 analysis		1 contemplate	
2 curb	_____ eagerness	2 extract	_____ think about deeply
3 gravel	_____ loan to buy a house	3 gamble	_____ bring back to health
4 mortgage	_____ small stones mixed with	4 launch	_____ make someone angry
5 scar	_____ sand	5 provoke	
6 zeal		6 revive	
1 cavalry		1 demonstrate	
2 eve	_____ small hill	2 embarrass	_____ have a rest
3 ham	_____ day or night before a	3 heave	_____ break suddenly into small
4 mound	_____ holiday	4 obscure	_____ pieces
5 steak	_____ soldiers who fight from	5 relax	_____ make someone feel shy or
6 switch	_____ horses	6 shatter	_____ nervous
1 circus		1 correspond	
2 jungle	_____ musical instrument	2 embroider	_____ exchange letters
3 nomination	_____ seat without a back or	3 lurk	_____ hide and wait for someone
4 sermon	_____ arms	4 penetrate	_____ feel angry about something
5 stool	_____ speech given by a priest in	5 prescribe	
6 trumpet	_____ a church	6 resent	
1 artillery		1 decent	
2 creed	_____ a kind of tree	2 frail	_____ weak
3 hydrogen	_____ system of belief	3 harsh	_____ concerning a city
4 maple	_____ large gun on wheels	4 incredible	_____ difficult to believe
5 pork		5 municipal	
6 streak		6 specific	
1 chart		1 adequate	
2 forge	_____ map	2 internal	_____ enough
3 mansion	_____ large beautiful house	3 mature	_____ fully grown
4 outfit	_____ place where metals are	4 profound	_____ alone away from other
5 sample	_____ made and shaped	5 solitary	_____ things
6 volunteer		6 tragic	

Version 2 Academic Vocabulary

1 area		1 alter	
2 contract	_____ written agreement	2 coincide	_____ change
3 definition	_____ way of doing something	3 deny	_____ say something is not true
4 evidence	_____ reason for believing	4 devote	_____ describe clearly and exactly
5 method	_____ something is or is not true	5 release	
6 role		6 specify	
1 debate		1 correspond	
2 exposure	_____ plan	2 diminish	_____ keep
3 integration	_____ choice	3 emerge	_____ match or be in agreement
4 option	_____ joining something into a	4 highlight	_____ with
5 scheme	_____ whole	5 invoke	_____ give special attention
6 stability		6 retain	_____ to something
1 access		1 bond	
2 gender	_____ male or female	2 channel	_____ make smaller
3 implementation	_____ study of the mind	3 estimate	_____ guess the number or size
4 license	_____ entrance or way in	4 identify	_____ of something
5 orientation		5 mediate	_____ recognizing and naming
6 psychology		6 minimize	_____ a person or thing
1 accumulation		1 explicit	
2 edition	_____ collecting things over time	2 final	_____ last
3 guarantee	_____ promise to repair a broken	3 negative	_____ stiff
4 media	_____ product	4 professional	_____ meaning `no' or `not'
5 motivation	_____ feeling a strong reason or	5 rigid	
6 phenomenon	_____ need to do something	6 sole	
1 adult		1 abstract	
2 exploitation	_____ end	2 adjacent	_____ next to
3 infrastructure	_____ machine used to move	3 controversial	_____ added to
4 schedule	_____ people or goods	4 global	_____ concerning the whole world
5 termination	_____ list of things to do at	5 neutral	
6 vehicle	_____ certain times	6 supplementary	

APPENDIX B

Reading Comprehension Test



READING COMPREHENSION TEST

Name _____ Surname _____ Class _____ Score _____

READING 1: LAKE CHAD

Figure 1 shows changing levels of Lake Chad, in Saharan North Africa. Lake Chad disappeared completely in about 20,000 BC, during the last Ice Age. In about 11,000 BC it reappeared. Today, its level is about the same as it was in AD 1000.

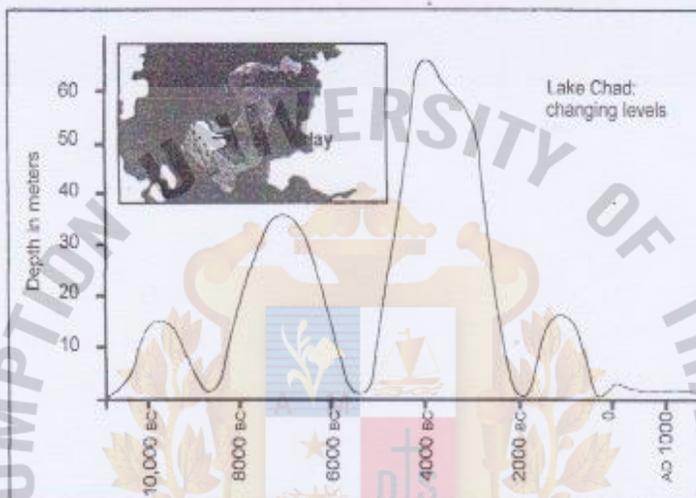


Figure 1

Figure 2 shows Saharan rock art (ancient drawings or paintings found on the walls of caves) and changing patterns of wildlife.

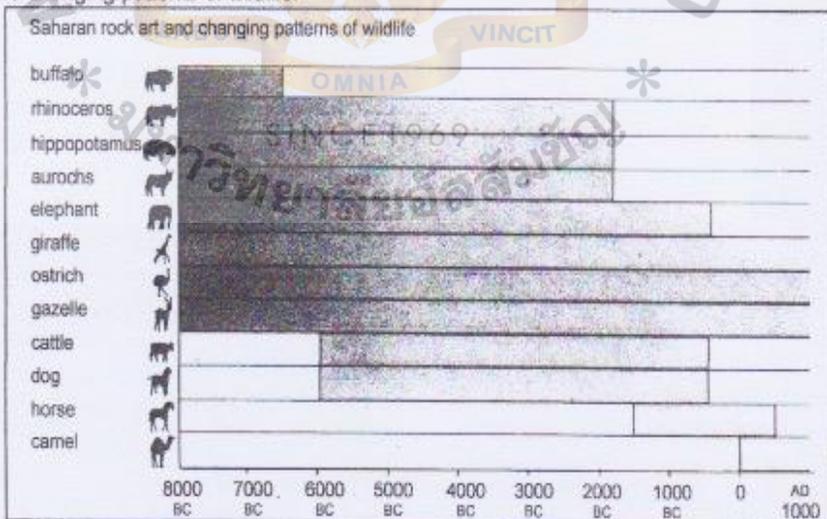


Figure 2

Source: Copyright Bartholomew Ltd. 1988. Extracted from *The Times Atlas of Archaeology* and reproduced by permission of Harper Collins Publishers.

Question 1.1

What is the depth of Lake Chad today?

- A. About two meters.
 - B. About fifteen meters.
 - C. About fifty meters.
 - D. It has disappeared completely.
 - E. The information is not provided.
-

Question 1.2

In about which year does the graph in Figure 1 start?

.....

Question 1.3

Why has the author chosen to start the graph at this point?

.....

Question 1.4

Figure 2 is based on the assumption that

- A. the animals in the rock art were present in the area at the time they were drawn.
 - B. the artists who drew the animals were highly skilled.
 - C. the artists who drew the animals were able to travel widely.
 - D. there was no attempt to domesticate the animals which were depicted in the rock art.
-

For this question you need to draw together information from Figure 1 and Figure 2.

Question 1.5

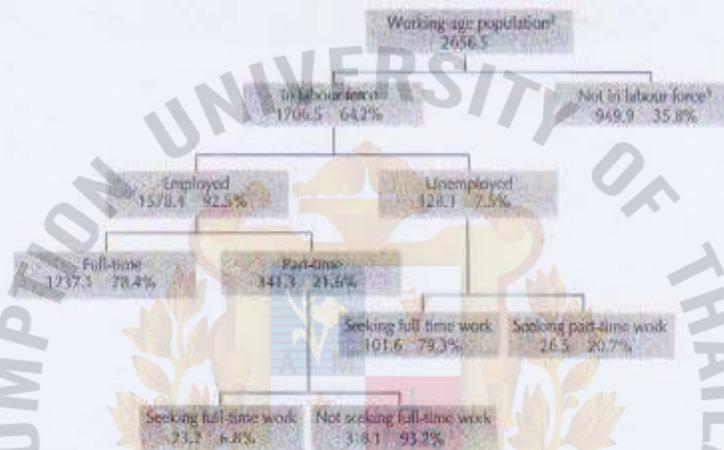
The disappearance of the rhinoceros, hippopotamus and aurochs from Saharan rock art happened

- A. at the beginning of the most recent Ice Age.
 - B. in the middle of the period when Lake Chad was at its highest level.
 - C. after the level of Lake Chad had been falling for over a thousand years.
 - D. at the beginning of an uninterrupted dry period.
-

READING 2: LABOUR

The tree diagram below shows the structure of a country's labour force or "working-age population". The total population of the country in 1995 was about 3.4 million.

The Labour Force Structure year ended 31 March 1995 (000s)¹



- Numbers of people are given in thousands (000s).
 - The working-age population is defined as people between the ages of 15 and 65.
 - People "Not in labour force" are those not actively seeking work and/or not available for work.
- Source: D. Miller, Form 6 Economics, ESA Publications, Box 9453, Newmarket, Auckland, New Zealand, p.64.

Use the information about a country's labour force shown above to answer the questions below.

QUESTION 2.1

What are the two main groups into which the working-age population is divided?

- Employed and unemployed.
- Of working age and not of working age.
- Full-time workers and part-time workers.
- In the labour force and not in the labour force.

QUESTION 2.2

How many people of working age were not in the labour force? (Write the *number* of people, not the percentage.)

.....

QUESTION 2.3

In which part of the tree diagram, if any, would each of the people listed in the table below be included? Show your answer by placing a cross in the correct box in the table.

The first one has been done for you.

	In labour force: employed	*In labour force: unemployed*	*Not in labour force*	Not included in any category
A part-time waiter, aged 35	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A business woman, aged 43, who works a sixty-hour week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A full-time student, aged 21	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A man, aged 28, who recently sold his shop and is looking for work	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A woman, aged 55, who has never worked or wanted to work outside the home	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A grandmother, aged 80, who still works a few hours a day at the family's market stall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

QUESTION 2.4

Suppose that information about the labour force was presented in a tree diagram like this every year.

Listed below are four features of the tree diagram. Show whether or not you would expect these features to change from year to year, by circling either "Change" or "No change". The first one has been done for you.

Features of tree Diagram	Answer
The labels in each box (e.g. "In labour force")	Change / <u>No change</u>
The percentages (e.g. "64.2%")	Change / No change
The numbers (e.g. "2656.5")	Change / No change
The footnotes under the tree diagram	Change / No change

QUESTION 2.5

The information about the labour force structure is presented as a tree diagram, but it could have been presented in a number of other ways, such as a written description, a pie chart, a graph or a table.

The tree diagram was probably chosen because it is especially useful for showing

- changes over time.
- the size of the country's total population.
- categories within each group.
- the size of each group.

READING 3: RUNNERS

Feel good in your runners

For 14 years the Sports Medicine Centre of Lyon (France) has been studying the injuries of young sports players and sports professionals. The study has established that the best course is prevention ... and good shoes.



Knocks, falls, wear and tear...

Eighteen per cent of sports players aged 8 to 12 already have heel injuries. The cartilage of a footballer's ankle does not respond well to shocks, and 25% of professionals have discovered for themselves that it is an especially weak point. The cartilage of the delicate knee joint can also be irreparably damaged and if care is not taken right from childhood (10-12 years of age), this can cause premature osteoarthritis. The hip does not escape damage either and, particularly when tired, players run the risk of fractures as a result of falls or collisions.

According to the study, footballers who have been playing for more than ten years have bony

outgrowths either on the tibia or on the heel. This is what is known as "footballer's foot", a deformity caused by shoes with soles and ankle parts that are too flexible.

Protect, support, stabilise, absorb

If a shoe is too rigid, it restricts movement. If it is too flexible, it increases the risk of injuries and sprains. A good sports shoe should meet four criteria:

Firstly, it must provide exterior protection: resisting knocks from the ball or another player, coping with unevenness in the ground, and keeping the foot warm and dry even when it is freezing cold and raining.

It must support the foot, and in particular the ankle joint, to avoid sprains, swelling and other

problems, which may even affect the knee.

It must also provide players with good stability so that they do not slip on a wet ground or skid on a surface that is too dry.

Finally, it must absorb shocks, especially those suffered by volleyball and basketball players who are constantly jumping.

Dry feet

To avoid minor but painful conditions such as blisters or even splits or athlete's foot (fungal infections), the shoe must allow evaporation of perspiration and must prevent outside dampness from getting in. The ideal material for this is leather, which can be waterproofed to prevent the shoe from getting soaked the first time it rains.

Use the article on the previous page to answer the questions below.

QUESTION 3.1

What does the author intend to show in this text?

- A. That the quality of many sports shoes has greatly improved.
- B. That it is best not to play football if you are under 12 years of age.
- C. That young people are suffering more and more injuries due to their poor physical condition.
- D. That it is very important for young sports players to wear good sports shoes.

QUESTION 3.2

According to the article, why should sports shoes not be too rigid?

QUESTION 3.3

One part of the article says, "A good sports shoe should meet four criteria."
What are these criteria?

QUESTION 3.4

Look at this sentence from near the end of the article. It is presented here in two parts:

"To avoid minor but painful conditions such as blisters or even splits or athlete's foot (fungal infections),..."

(first part)

"...the shoe must allow evaporation of perspiration and must prevent outside dampness from getting in."

(second part)

What is the relationship between the first and second parts of the sentence?

The second part

- A. contradicts the first part.
- B. repeats the first part.
- C. illustrates the problem described in the first part.
- D. gives the solution to the problem described in the first part.

READING 4: BEES

Bees Text

The information on this page and the next page is from a booklet about bees. Refer to the information to answer the questions which follow it.

Collecting Nectar

Bees make honey to survive. It is their only essential food. If there are 60,000 bees in a hive about one third of them will be involved in gathering nectar, which is then made into honey by the house bees. A small number of bees work as foragers or searchers. They find a source of nectar, then return to the hive to tell the other bees where it is.

Foragers let the other bees know where the source of the nectar is by performing a dance which gives information about the direction and the distance the bees will need to fly. During this dance the bee shakes her abdomen from side to side while running in circles in the shape of a figure 8. The dance follows the pattern shown on the following diagram.



The diagram shows a bee dancing inside the hive on the vertical face of the honeycomb. If the middle part of the figure 8 points straight up it means that bees can find the food if they fly straight towards the sun. If the middle part of the figure 8 points to the right, the food is to the right of the sun.

The distance of the food from the hive is indicated by the length of time that the bee shakes her abdomen. If the food is quite near the bee shakes her abdomen for a short time. If it is a long way away she shakes her abdomen for a long time.

MAKING HONEY

When the bees arrive at the hive carrying nectar they give this to the house bees. The house bees move the nectar around with their mandibles, exposing it to the warm dry air of the hive. When it is first gathered the nectar contains sugar and minerals mixed with about 80% water. After ten to twenty minutes, when much of the excess water has evaporated, the house bees put the nectar in a cell in the honeycomb where evaporation continues. After three days, the honey in the cells contains about 20% water. At this stage, the bees cover the cells with lids which they make out of beeswax.

At any one time the bees in a hive usually gather nectar from the same type of blossom and from the same area. Some of the main sources of nectar are fruit trees, clover and flowering trees.

Source: "Hum Sweet Hum", National Foundation for Educational Research, 1993.

GLOSSARY

house bee	a worker bee which works inside the hive.
mandible	mouth-part.

QUESTION 4.1

What is the purpose of the bees' dance?

- A. To celebrate the successful production of honey.
- B. To indicate the type of plant the foragers have found.
- C. To celebrate the birth of a new Queen Bee.
- D. To indicate where the foragers have found food.

QUESTION 4.2

Write down three of the main sources of nectar.

1.
2.
3.

QUESTION 4.3

What is the main difference between nectar and honey?

- A. The proportion of water in the substance.
- B. The proportion of sugar to minerals in the substance.
- C. The type of plant from which the substance is gathered.
- D. The type of bee which processes the substance.

QUESTION 4.4

In the dance, what does the bee do to show how far the food is from the hive?

-
-

BIOGRAPHY



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