The Effects of Derivational Suffixes on English Vocabulary Knowledge in Thai High School Learners
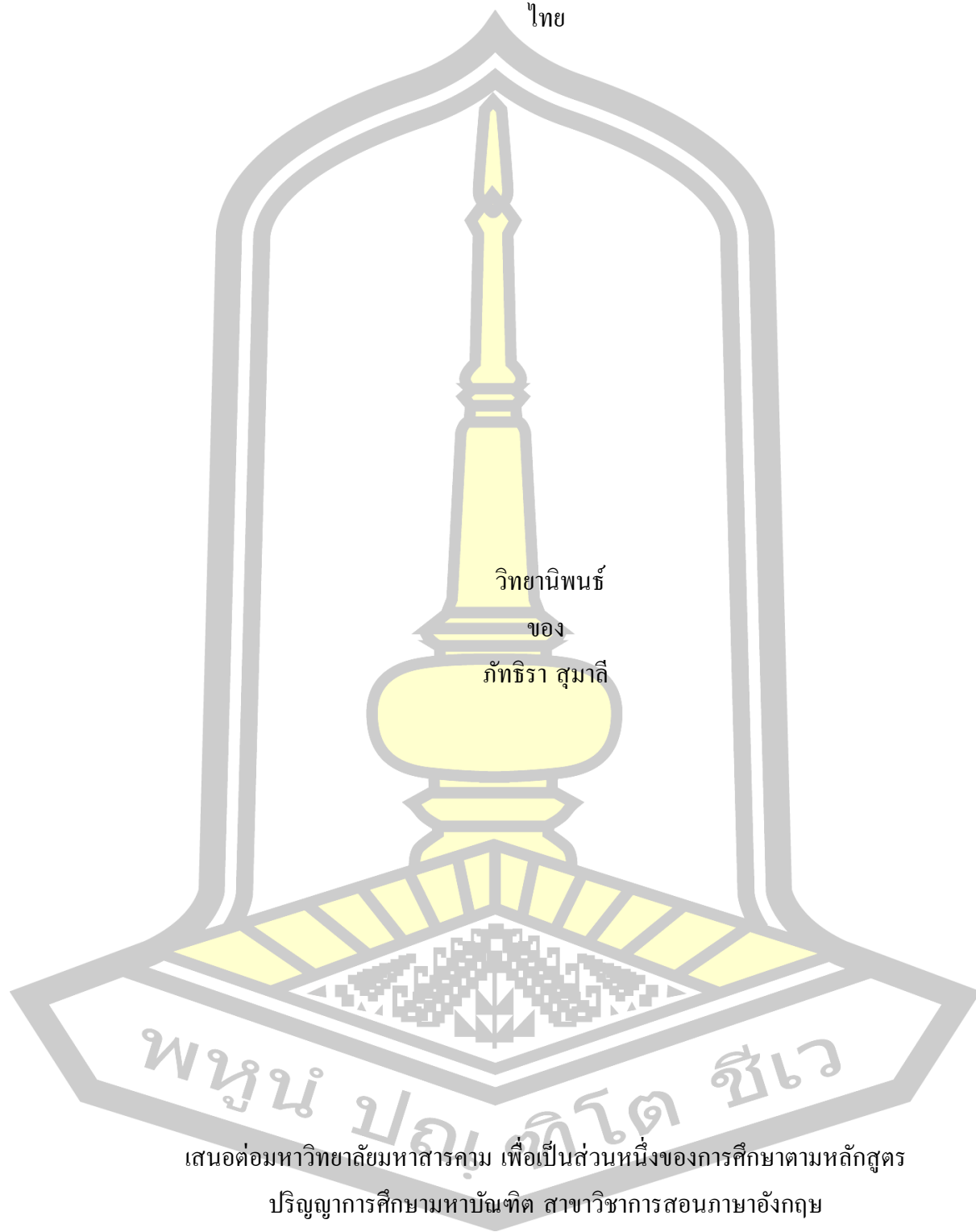
Pattira Sumalee

A Thesis Submitted in Partial Fulfillment of Requirements for

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The examining committee has unanimously approved this Thesis, submitted by Miss Pattira Sumalee , as a partial fulfillment of the requirements for the Master of Education English Language Teaching at Mahasarakham University

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ABSTRACT

Although derivatives are an essential component of a morphological word and cornerstones for vocabulary knowledge, L2 vocabulary research has shown that EFL learners still have inadequate vocabulary knowledge. Therefore, this study attempted to investigate the effect of derivational suffix instruction on vocabulary knowledge. Fifty-eight high school learners were recruited to participate in the study. The learners were divided into two groups: control (n=29) and experimental (n= 29). The experimental group received a regular English course with an emphasis on derivational suffix instruction, whereas the control group only received a regular English course. Two tests of receptive and productive derivational suffixes were developed and piloted to measure high school learners' suffix knowledge. Questionnaire was also administered to explore the experimental participants' perceptions of derivational suffix instruction in facilitating vocabulary knowledge. Descriptive and inferential statistics, including pair-sample *t*-tests and independent-sample *t*-tests, were conducted to analyze the quantitative data. The results showed that high school learners in both groups significantly performed better on the posttest than on the pretest. The results analysis also revealed that experimental learners significantly outperformed their control counterparts. These findings suggest the efficacy of derivational suffix instruction on English vocabulary knowledge in Thai high school learners. In addition, the questionnaire analysis indicated that experimental high school learners had a positive perception of derivational suffix instruction in improving their vocabulary knowledge. Together, the current findings highlight the importance of derivational suffixes in vocabulary acquisition and development. The study also points out the implications for practitioners and researchers. Other relevant implications and suggestions for future studies are also addressed.

Keyword : Derivational suffixes, receptive vocabulary knowledge, productive vocabulary knowledge, Thai high school learners, Learner's perceptions, Effect size

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

List of Tables

List of Figures

CHAPTER I
INTRODUCTION

This chapter presents the general overview of the research beginning with the background of the study (see 1.1) and the purposes of the study (see 1.2). The chapter further describes the scope of the study (see 1.3) and the significance of the study (see 1.4), followed by the definitions of key terms (see 1.5). The chapter ends with the organization of the thesis (see 1.6).

1.1 Background of the study

Vocabulary knowledge is undoubtedly essential for second or foreign language (L2) learning and learners' English language proficiency (Laufer, 2017; Nation, 2013; Sasao & Webb, 2017; Schmidt, 2010; Schmitt, 2010; Webb & Nation, 2017). Schmitt (2010) noted that "one thing that all of the partners involved in the learning process (students, teachers, materials writers, and researchers) can agree upon is that learning vocabulary is an essential part of mastering a second language" (p. 4). In this regard, Schmitt highlights the importance of vocabulary knowledge on L2 skills. However, acquiring and gaining sufficient vocabulary knowledge has often become a big challenge for most students due to several factors, including characteristics, language exposure, prior knowledge and learning strategies (Nation, 2013; Sukying, 2021; Yunus *et al*., 2016). Furthermore, vocabulary research suggests that L2 learners need an extensive vocabulary size to communicate in English. Specifically, a vocabulary of around 8000 to 9000 words is required in order to sufficiently comprehend authentic texts while reading (Laufer & Ravenhorst-Kalovski, 2010; Nation, 2006; Schmitt, 2008; Schmitt, Jiang, & Grabe, 2011). A vocabulary size of about 6000 to 7000 words is required for understanding spoken discourses. Interpretation of a speaker's communicative intent that was continuing and located includes both the addressee's expectations and actual responses (Cornish, 2006). However, research showed that EFL learners' vocabulary size is 2,100 words, broadly ranging from 1,400 to 4,000 words (Laufer, 2000, Nation, 2006; Nurweni & Read, 1999). These studies proved that L2 learners' vocabulary size is still a lag behind that needed for mastering a second language (L2).

However, there is still an ongoing debate about the best strategy for teaching vocabulary. Some research suggests that intentional vocabulary teaching techniques,

such as word cards and word parts, effectively promote vocabulary learning and growth (Bubchaiya & Sukying, 2022; Sukying, 2018b; 2020; Yowaboot & Sukying, 2022). Other studies also show intentional vocabulary learning is more effective than incidental learning since the latter requires long-term and extensive exposure to lexical input (Elgort, 2011; Magnussen & Sukying, 2021; Nation, 2013). Besides, research also indicates that the underlying rationale for intentional vocabulary learning is noticing, which is necessary for L2 vocabulary acquisition and development (Hulstijn, 2003). Nation (2013) also argues that noticing deliberate instruction, retrieval, and creative (generative) use promotes vocabulary learning.

Clearly, the previous study provided different effective vocabulary learning, both incidental and deliberate. The incidental teaching showed mastering vocabulary knowledge through recognizing and paying attention to words such as observations, talking with friends, making errors, or reading a particular context (Laufer & Hulstijn, 2001). Similarly, the researcher's classroom frequently used incidental instruction with students in classroom tasks and activities. However, it was insufficient because using incidental teaching took a long term to remember the words. Some students are in difficult situations based on background knowledge, living conditions, family income, and lack of opportunity to meet new media. They were taught and learned English vocabulary only at school, where teachers' instruments could access to improve the English language, particularly English vocabulary. For example, the internet, visual media, smartphones, and intelligent television may enhance students' familiarity with English. These problems lead to deliberate instruction. Hulstijn (2003) stated that purposeful vocabulary learning acquires knowing the word using memorizing strategies to recall this lexical item later. The suggestion noted that being a master of L2 learners in vocabulary knowledge requires them to remember form and its meaning.

Another successful pedagogy to deal with the lack of vocabulary is to determine the meaning and syntactic category of unfamiliar words by making use of a word's morphological structure since most high-frequency words consist of about six members (Nation, 2013) to suppose that learners will be proved vocabulary knowledge in term of vocabulary size. For instance, it is well known that learners recognize learn as a verb and *learnable* as an adjective because of its suffix *-able*. In addition, researchers show

that the first two thousand words make up around 82% of the coverage of written texts (Nation, 2013). Recognizing the morphemic structure in complex words and knowing the meaning through the more familiar vocabulary items seems very useful. Knowing the form and meaning link is also regarded as the initial stage of vocabulary learning. Indeed, there is ample evidence that learners use word components in learning unfamiliar words (e.g., Sukying, 2017, 2020). In his detailed study, Sukying (2017) shows that an increasing level of education and knowledge of affixes can account for a great deal of the vocabulary growth of high school students. Sukying (2020) also found a significant effect of morphological knowledge on vocabulary growth among Thai university learners. This study aligns with other findings (Mochizuki & Aizawa, 2000; Schmitt & Meara, 1997; Schmitt & Zimmerman, 2002). Other studies also show the link between vocabulary knowledge and derivative knowledge (Hayashi & Murphy, 2011; Mochizuki & Aizawa, 2000; Schmitt & Meara, 1997).

In Thailand, where English is taught as a foreign language, students can learn English from primary school to tertiary education. However, students' vocabulary size is still far behind that needed for academic study (Sukying, 2017; Ward & Chuenjundaeng, 2009). To this end, vocabulary teaching remained an essential foundation of successful vocabulary learning in an EFL classroom (Bubchaiya & Sukying, 2022; Hees & Nation, 2017; Magnussen & Sukying, 2021; Yowaboot & Sukying, 2022). As such, vocabulary teaching might be carefully selected for classroom practice to match learners' needs and proficiency levels. Researchers also argue that solid vocabulary was essential for every stage of language learning; therefore, vocabulary was the focus of learning and teaching (Lewis, 1993; Laufer, 1997; Nation, 2013). For instance, Sukying (2020) investigated the effect of affix instruction on vocabulary acquisition among Thai university learners and found a significant improvement in treatment participants. Recently, Bubchaiya and Sukying (2022) implemented the word part strategies to improve primary school students in a provincial area of Northeastern Thailand. They found that students significantly improved their vocabulary knowledge with the satisfaction of word part strategy instruction during the study. Together, these studies proved that affix instruction facilitates students requiring vocabulary knowledge.

The best example of previous studies in the Thai context, Bubchiya and Sukying studies, revealed the importance of teaching affixes to improve vocabulary knowledge and L2 skills. Bubchiya (2022) provided her study in the primary school context to improve vocabulary knowledge with young learners. She used word parts strategies to increase vocabulary knowledge, and Sukying (2020) showed vocabulary development and growth among Thai university learners. The receptive and the productive were constructed for vocabulary knowledge. However, a few focused on derivational suffixes instruction in high school learners. Therefore, this current study focused on the effects of derivational suffixes on Thai high school learners' English vocabulary knowledge to highlight the importance of suffixes in vocabulary knowledge and development. Teaching procedure provided through classroom activities for the development of affix knowledge especially suffixes aspects in EFL contexts and language abilities.

Affixes with an emphasis on derivational suffixes in the current study were essential components of word knowledge (e.g., Sukying, 2017). Such knowledge facilitates students to require new forms of morphologically complex words without learning individual forms separately (Bauer & Nation, 1993). Based on the literature review, most studies have been done to determine the effect of affix instruction on vocabulary knowledge among primary school students (Bubchaiya & Sukying, 2022) and university learners (Sukying, 2020). Derivational suffixes could indicate a word's syntactic category, making it easier for learners to understand it in reception and produced in language use. For example, adding the smallest word component suffixes, as *-ion* to the verb *relate,* will change it to the noun *relation*.

In contrast, the adjective *relative* was designated the suffix addition *-ive* to the verb *relate*. These derivational suffix words could be transformed into other syntactic and provided linguistic rules. Thus, the process of English affixes was beneficial for learning lexical components (Sukying, 2020) and demonstrated the ability of derivational suffixes to locate a new word in the sentence (Sukying, 2018a). Therefore, this study investigated the effect of deliberate vocabulary teaching using derivational suffixes on Thai EFL learners studying in grade 8, 2022, at the local high school in Surin, Northeastern Thailand. Understanding the role of derivational

suffixes may yield fruitful information for practitioners and researchers and is worth fulfilling the gap of derivational suffixes instruction in different contexts.

1.2 Purposes of the study

The study aimed to examine the effect of derivational suffix instruction on English vocabulary in Thai high school learners. The notion of Bauer and Nation's (1993) word family model and Nation's (2013) framework of word knowledge: form, meaning, and use will be used to operationalize the study. Indeed, the current study focused solely on derivational suffixes, assuming they play a significant role in vocabulary acquisition and development (Nation, 1990, 2013; Schmitt, 2010; Sasao & Webb, 2017; Sukying, 2017, 2018a, 2018b, 2020, 2022). The current study also sought to explore Thai EFL high school learners' perceptions of derivational suffix instruction. The following research questions were formulated to guide the study:

1. To what extent does derivational suffix instruction affect Thai high school learners' English vocabulary learning?
2. What are Thai high school learners' perceptions of the derivational suffix instruction?

1.3 Scope of the study

This study was quasi-experimental research, with two groups, one control group and the other an experimental group, designed to use suffixes based on Bauer and Nation's (1993) word family criteria and the student's book developed by Verginia and Jenny (2021). Therefore, the prompt words were selected based on the school textbook, and affixes were derived from the chosen words. The participants were initially collected from Thai EFL high school learners studying in grade eight, 2022, aged between 14 and 15, at the local high school in Surin, Northeastern, Thailand. The participants were selected from the convenience sampling with similar English level proficiency. The instruction occurred with an experimental group being taught word-building based on derivational suffixes of Bauer and Nation's (1993) word family notion. The experimental group received 13 additional hours of explicit instruction on vocabulary knowledge. By contrast, the control group was not taught any derivational suffixes. Instead, the control group received the same number of English lessons, including listening, reading, speaking and writing.

The data were collected during the 12 weeks or about three months. Indeed, the data collection was carried out during the second semester of the 2022 academic calendar. Three measures of vocabulary knowledge and derivational suffixes, as well as the questionnaire, had employed to collect the quantitative data, which was analyzed using the SPSS software version 22. The study limited itself to the convenience sampling of one regional school where the researcher was one of the English language teachers. The current findings might not be generalizable to other contexts because the participants were selected using convenience sampling. After all, the researcher was a school teacher. Instead, the initial incentive was to enhance school students' vocabulary acquisition and development. And other learning activities or tasks were also restricted due to the Covid 19 pandemic.

1.4 Significance of the study

Assuming that knowledge of word families could facilitate vocabulary learning and development, the study could shed light on the role of derivational suffixes in vocabulary acquisition and growth. Pedagogically, the current findings provided evidence of the significant role of derivational suffixes in vocabulary acquisition and development. Specifically, the efficacy of deliberate teaching of derivational suffixes should be added to EFL classroom practices. Moreover, derivational suffix instruction also mediated learners acquiring linguistic and semantic vocabulary. The aspects of knowledge in derivational suffix instruction are essential for learning and teaching vocabulary in both receptive and productive.

In brief, the study points out that word families are a unit for teaching and learning morphologically complex words. Furthermore, the study provided helpful guidelines for classroom practice for language teachers and implications for researchers and materials developers for further innovations.

1.5 Definitions of key terms

A derivational suffix refers to a new word with a new meaning and is usually a different part of speech but can be inferred from the old definition.

Receptive vocabulary knowledge is the ability to recognize and remember the word (knowledge of the form-meaning links) at least partially.

Productive vocabulary knowledge entails the ability to recall and retrieve the form and meaning of the derivational suffix and being able to produce it correctly.

Thai high school learners refer to Thai EFL students who are studying in grade eight, 2023, at the provincial high school in Surin province, Northeastern Thailand

The suffix instruction involves the explicit teaching of derivational suffixes in English based on Bauer and Nation's (1993) word family theory, designated the suffix addition and provided parts of speech.

Perceptions refer to feelings or thoughts about the derivational suffix instruction.

Effect size refers to the strength of an effect (or relationship difference), and it also tells about the differences between groups.

1.6 Structure of thesis

Chapter One presents the background of the study, the purposes of the study, the scope of the study, the significance of the study, and definitions of key terms.

Chapter Two presents the conceptualization of vocabulary knowledge. The chapter also conceptualizes the theoretical frameworks of knowing a word, vocabulary learning goals, vocabulary learning strategies (VLSs), and derivational suffix instruction.

Chapter Three outlines the research methodology of the current study, including the research design, the participants and setting, the research instruments, and data collection and analysis procedures.

Chapter Four presents the study results and provides a preliminary discussion of these findings to the research questions. The result reports include descriptive and inferential statistics.

Chapter Five provides a detailed discussion of the research findings and relates these findings to the earlier literature and theory. The results are discussed beyond the structure of the research questions, covering the conceptualization of vocabulary knowledge and word family constructs. It also highlights the essential findings and significant contributions to vocabulary acquisition and offers theoretical and

pedagogical implications. This chapter also points out some limitations arising from the study and discusses potential directions for future studies.
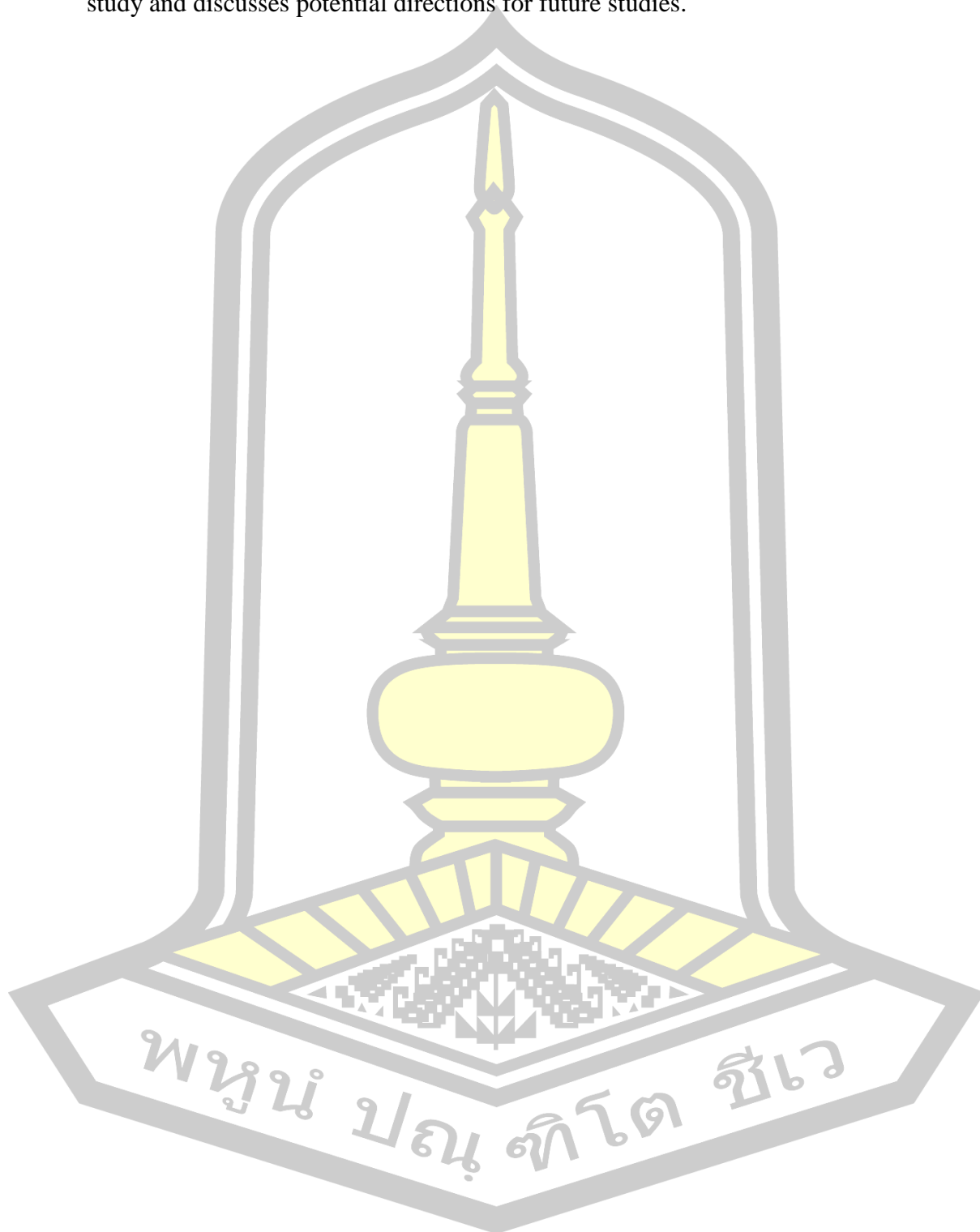
CHAPTER II
LITERATURE REVIEW

This chapter outlines the documents in the literature in order to frame the current study. The chapter starts with the theoretical and empirical framework of word knowledge proposed by different vocabulary scholars and researchers (2.1). This follows the notion of morphological knowledge (2.2), roles of derivational suffix knowledge in vocabulary acquisition and growth (2.3), teaching vocabulary (2.4), assessing vocabulary (2.5), and ends with overviews relevant to the previous study (2.6).

2.1 What is involved in knowing a word

Several theoretical frameworks have defined word knowledge as vocabulary knowledge (Laufer, 1998, 1992, 1997; Nation, 2013) or lexical knowledge (Laufer & Goldstein, 2004; Schmitt, 2014). The definitions associated with the word in the English language involve a single item and phrase or chucks are the ability to provide the particular word's meaning (Henriksen, 1999; Milton, 2009; Nation, 1990, 2001, 2013; Read, 1993, 2000; Schmitt, 2014). In addition, expanding word knowledge can help learners achieve the concrete and abstract meanings connected with comprehension and word knowledge that continues literacy in both speaking and writing. Therefore, word knowledge's classifications are composed of three main aspects; form, meaning, and use (Nation, 2013), which also provide the factors in English linguistics such as grammatical functions.

Based on the definition above clarifies that vocabulary knowledge is a significant aspect that requires learners to be strong in word form, meaning, and use. The knowledge is most useful for speaking, writing, and grammatical functions. This requires lexical researchers who use terminology to support knowing the word. The researcher proposes to define two different binary qualities of lexical knowledge constructed: "breadth" and "depth", the effectiveness of knowing the word.

The conceptualizes vocabulary knowledge slightly earlier perspective presented by Anderson and Freebody (1981), who introduced depth and breadth. "Depth", the comprehension of a single term, reflects the 'quality' or 'depth', the knowledge of a particular word. In contrast, the "breadth" of lexical knowledge refers to the

number of words known at the minimum. In addition, in the recently conducted studies (Li & Kirby, 2014; Read, 1993, 2004), 'depth' of knowledge refers to the knowledge of learner perceives the word information, while 'breadth' refers to the size of words knowledge as learner's understanding of individual vocabulary. Thus, 'breadth' is easy to define in lexical knowledge considering to size of vocabulary, such as a number for the word meanings are at least partially known; 'depth' in vocabulary knowledge defines a fruitful lexical understanding, how well personal understand a particular word and several associative connections multi-word meaning senses.

As more knowing the word is pointed to three aspects of the knowledge. Henriksen's (1999) research identifies a word knowledge: the knowledge scales of partial-precise characteristics, the knowledge depth, and the knowledge of receptive versus productive dimensions. In general, partial precision comprises varying degrees of word understanding, and the study highlights the degrees of word meaning and shapes identification. Henriksen argues that vocabulary knowledge includes several aspects of a word's "depth" understanding. Similarly, for the receptive-productive dimension, she believes that the ability to use and know a single word is connected with small differences in lexical items.

Due to knowing the word, Nation (2013) suggested three distinct categories of lexical knowledge: form, meaning, and use. The information on 'form' includes the capacity to recognize a word's spoken and written forms as well as the expressive affixes. Knowing the meaning scope of a lexical item requires knowledge of form and meaning, ideas and referents, and lexical associations. Consistent with the field of use is the capacity to utilize the word with linguistic precision (grammar functions) and appropriate collocations (collocations), as well as a knowledge of word usability (use restrictions), including register and frequency. There are nine various dimensions of the term information, including receptive-productive distinctions, according to Nation's (2013) criteria (see Table 1).

Table 1 Components of vocabulary knowledge (Nation, 2013, p. 49)

Form	Spoken	R	What does the word sound like?
		P	How is the word pronounced?
	Written	R	What does the word look like?
		P	How is the word written and spelled?
	Word parts	R	What parts are recognizable in this word?
		P	What word parts are needed to express meaning?
Meaning	Form and meaning	R	What meaning does this word form signal?
		P	What word form can be used to express this meaning?
	Concepts and references	R	What is included in the concept?
		P	What items can the concept refer to?
	Associations	R	What others words does this word make us think of?
		P	What other words could we use instead of this one?
Use	Grammatical functions	R	In what patterns does the word occur?
		P	In what patterns must we use this word?
	Collocations	R	What words or types of word occur with this one?
		P	What words or types of words must we use with this one?
	Constraints on use	R	Where, when and how often would we meet this word?
		P	Where, when and how often can we use this word?

Notes: R= receptive, P= productive

Table 1 assumes the vocabulary knowledge components of Nation (2013). He offered several diverse word knowledge components, including *form*, *meaning*, and *use*, which illustrated learners' particular comprehension of receptive (R) and productive (P) word knowledge (P). Receptive requires recognizing the form and meaning of a word, whereas productive requires recalling and recovering the word's form and meaning in appropriate contexts.

According to Nation (2013), knowing a word form requires knowledge of its spoken form, written form, and word parts. Understanding both spoken and written versions of words is essential for learners to continue their literacy development. Understanding phonics, spelling, and word restructuring allows learners to interpret the meaning of words and apply them in varied contexts. In receptive knowledge, knowing the spoken form refers to hearing the term and articulating it in a way that allows others to comprehend it in conversation, producing productive knowledge. When reading,

understanding the written form implies the ability to perceive the written form, which is known as receptive knowledge; conversely, knowing the written form involves being able to spell the written form accurately, which is known as productive knowledge (Schmitt, 2000).

Regarding word meaning, Nation (2013) stated that understanding the meaning of a word needs relating form and meaning, conception and referents, and word associations. Typically, both word form and meaning may be learned simultaneously. It means that when learners hear and see the word form, its meaning is recovered, and when they attempt to articulate its meaning, the form is recovered. According to Daulton (1998), essentially identical form in the target and first languages facilitates learning word meanings more easily. Aitcheson (1987) also emphasizes that the boundary among the meanings of words is fuzzy. One of the primary reasons is that schema varies between situations (Schmitt, 2000). In addition, Richards (1976:81) asserts that words don't really exist in isolation. Knowing a word requires an understanding of word association. Word connections are associated with the thoughts of individuals. A single word is provided to a learner, from which unsimilar or contrasting words and related words spontaneously emerge.

Regarding word use, Nation (2013) explains that due to several elements, such as register, frequency, and cultural backgrounds, knowing how to use a word includes understanding its grammatical functions, collocations, and use restrictions. The grammatical function is one of the major key linguistics when selecting a word. The grammatical function is related to the word classes and grammatical patterns in which the word can fit. For instance, we can say, "I bite a lot, I eat a lot, and I talk a lot", but not "I bit a lot, I ate a lot, and I spoke a lot." Registration and regularity are two more categories of word use limitations. Register refers to the stylistic limits that "make each word more or less suitable for particular language settings or linguistic objectives" (Schmitt, 2000:31).

The notion of word is also linked to the concept of word families. Word families were first introduced by Bauer and Nation (1993) as a central organizing unit for language teaching and learning. It is hypothesized that new forms of morphologically complex words can be acquired without learning a particular form separately. Therefore, a word

family refers to a group of words that comprises a headword (base) and all its inflected and all transparent derived vocabulary forms (Bauer & Nation, 1993). Bauer and Nation (1993) listed the seven levels of word families based on four principal factors: frequency, productivity, regularity, and predictability as showing 7 levels in table 2, Bauer and Nation's (1993) list of affixes.

In conclusion, the current research will utilize Nation's (2013) framework and operationalize the notion of vocabulary knowledge in various aspects of the scholars. It provides breadth (size or number of words) and depth (a particular word with multi meanings). The vocabulary size, also known as receptive vocabulary knowledge, refers to the quantitative (number of words) as individuals are known, at least to some level. The depth of vocabulary knowledge, which is exchangeable with productive vocabulary knowledge, includes the quality of the learner's comprehension of particular individual words.

2.2 Morphological knowledge

Morphological knowledge is often referred to as affix knowledge (Sukying 2017) or morphological awareness (Hayashi & murphy 2011). Morphological awareness entails internal vocabulary structures that are distinguished and manipulated by learners' ability to segment the smallest words and give meaning to language (Carlisle 2000; Lieber 2010; Sukying 2017, 2018b, 2020, 2022). Words may contain one morpheme, act, or have multiple morphemes, such as *actor*. The smallest morpheme *-or* gives a meaningful word to change the base word in a verb act to a noun by adding *-or*, *actor*. Further, three morphemes can happen when adding *-s* after the word *actors* to transform it into a plural. It is also used in spoken and written forms to learn perception, recognize, combine, manipulate, and produce morphemes, producing both receptive (hear and see) and productive (speak and write). Further identifying the two types of morphemes, free morphemes can stand alone, whereas bound morphemes cannot do it. The functions of bound morphemes are only word units, and a part of a word: *un-*, *-tele*, *-ness*, *-er* (Finegan, 2012, p.46) may have no meaningful word. Controversy with a free morpheme can understand the meaning autonomously (e.g., zoo, house, run). Many English words can use multiple morphemes to build a new word by adding

prefixes and suffixes. One indicates the number, person, or tense called inflectional, but another one is concerned with changing the word's class, called derivatives.

Morphological knowledge includes inflectional and derivational affixes, which are generally helpful in composing a morphologically complex word (Sukying 2018; Claravall 2016; McBride-Chang *et al.* 2005; Nation 2013; Sasao & Webb 2017) and allow being used for vocabulary acquisition.

Inflectional knowledge is referred to as inflectional affixes in grammatical features and meaning relationships of the words in the contexts. Its marks are numbers and grammatical as in the plural of nouns (plural), tenses, persons, and comparatives or superlatives degree of adjectives or adverbs (Sukying, 2018). However, the inflectional affixes do not change the parts of speech of the words, but they change the word form to generate grammatical information. For example, the addition of *-s* marks for numbers (plural), adding -er marks for a comparison, adding -ed/-ing marks for tense, and adding -est marks for (superlative) (Nation, 2013). This is inflectional knowledge, in which affixes can freely attach the smallest word to change the new one and give different grammar features or numbers.

Derivational morphology, referred to as derivational affixes, produces learners' knowledge to constitute both prefixes and suffixes. Some prefixes and most suffixes are designed as syntactic or grammatical features, that is, the ability to recognize semantics or meaning within the words. The knowledge of derivational affixes works across syntactic categories (parts of speech), dividing forms of the root word into different grammatical categories. Thus, the understanding of derivational affixes is included syntactic, relational, and distributional knowledge (Sukying, 2018a).

The awareness of syntactic knowledge reveals grammatical categories in which learners understand the role of the word in the sentences; that is, the ability to recognize derivational suffixes used in the sentences. It could be assumed that a learner understands *painful* as an adjective due to its suffix *-ful* and *painfully* as an adverb because of its suffix *-ly*. Relational knowledge is the ability to tell apart how a word's complicated internal structure relates to two or more lexemes (the part of a word's form-meaning linkages). The ability to attach, for example, *dance* to *dancer* or *unlockable* to *lockable* That seems to be, relational knowledge demonstrates the ability to recognize

the connections between the root word and its derived forms. Finally, distributional knowledge is the learner's ability to handle limitations on a base word and its suffix contribution. In short, it involves being aware of the limits of using affixations in sentences. For example, *-ment* is added to a verb like *treatment* but not an adjective like *badment* is not. Therefore, the derivational suffix knowledge component with awareness of an affix's form, meaning, and use. Table 2 shows the useful affix based on Nation, 1993.

Table 2 Bauer and Nation's (1993) list of affixes

Level 1	Base words
Level 2	Base words + inflections
	-s (on noun or verb), -ed/ -ing (on verb), -er (er2)/ -est (on adjective), -th (on number), and -en (on irregular verb)
Level 3	Frequent and regular affixes
	-able/ible, -er/-or (on verb), -ish, -less, -ly, -ness, -th, -y, -non-, un-
Level 4	Frequent orthographically regular affixes
	-al (autumnal), -ation (admiration), -ess (fortress), -ful (plentiful), -ism (dogmatism), -ist (semanticist), -ity (solemnity), -ize (serialize), -ment (armament), -ous (fibrous) in-, im
Level 5	*Less frequent but regular affixes*
	-age (leakage), -al (arrival), -ally (idiotically), -an (American), -ance (clearance), -ant (consultant), -ary (revolutionary), -atory (confirmatory), -dom (kingdom; officialdom), -eer (black marketeer), -en (wooden), -en (widen), -ence (emergence), -ent (absorbent), -ery (bakery; trickery), -ese (Japanese; officialese), -esque (picturesque), -ette (usherette; roomette), -hood (childhood), -i (Israeli), -ian (phonetician; Johnsonian), -ite (Paisleyite; also chemical meaning), -let (coverlet), -ling (duckling), -ly (leisurely), -most (topmost), -ory (contradictory), -ship (studentship), -ward (homeward), -ways (crossways), -wise (endwise; discussion-wise),
	anti- (anti-inflation), ante- (anteroom), arch- (archbishop), bi- (biplane), circum- (circumnavigate), counter- (counter-attack), en- (encage; enslave), ex- (ex-president), fore- (forename), hyper- (hyperactive), inter- (inter-African, interweave), mid- (mid-week), mis- (misfit), neo- (neo-colonialism), post- (post-date), pro- (pro-British), semi- (semi-automatic), sub- (subclassify; subterranean), un- (untie; unburden).
Level 6	Frequent but irregular affixes
	-able (inscrutable), -ee (lessee), -ic (spastic), -ify (mollify), -ion (superstition), -ist (solipsist), -ition (transition), -ive (restive), -th (breadth), -y (calumny),
	pre-, re
Level 7	Classical affixes
	-ar (circular), -ate (electorate), -et (packet, casket), -some (troublesome), -ure (departure, exposure)

ab- (abnormal), ad- (admixture), com- (commiserate), de- (demist), dis- (disintegrate), ex- (out - external), in- (in - internal), ob- (obsequious), per- (perspective), pro- (in front of - procede), trans- (transmogrification)

The seven levels provide significance for learners' learning and teachers' teaching in the school. The basic steps for teaching depend on students' context, generally used, and learners' abilities to recognize them. This is significant of the smallest lexemes, which are added to a base or root and have been transformed systematically to develop a new word (Lieber, 2016). Teachers' instructions focus on learners mastering second language acquisition aspects of the learners' outcome, and developing vocabulary acquisition indicates a long-term meaning reorganization of a word's meaning. Likewise, Vadasy and Nelson (2012) said that the importance of morphology is learners building and developing words. Learners can break down unfamiliar words, conduct meaning in each part, and then hold parts back together at a word's meaning.

Prefixes

Meaningful parts of word components at the beginning of a base or root word to change the meaning are called prefixes. The meanings of prefixes are added to the meaning of the root or base word. For instance, the prefix "*un-*," which means "*not*," transforms the basic word "*important*" into "*not important*." However, prefixes cannot change the words into syntactic categories (parts of speech), such as the words *faithful* and *un-faithful*, which are both adjectives. The list of frequently used prefixes is presented below. (See Table 3)

Table 3 Examples of the most common prefixes

Prefix	Definition	Examples
un-	not, opposite, the reverse of	unclear, unhappy, unafraid, unsafe, unusual
re-	again, back	reapply, redesign, rewrite
in-, im-	not, opposite of	impatient, impossible, impolite, indirect
dis-	not, opposite of	discover, dislike
en-	cause to, in, cover	enjoy, entertain

Suffixes (derivational suffixes)

The concept of teaching vocabulary strategy is numerous and different techniques. However, teachers need to be aware of and focused on the following key aspects: form, meaning, and use. To derivational suffixes, the process of building the smallest lexeme attaches to the end of the root and forms the new word, such as adding *-er* to the verb *teach* to change the noun word, *teacher*. Several meanings expand, enabling to change of the word classification, such as teach (v) → teacher (n). Adam (2014) stated that a base word is built through the formation of new words, is typically complicated, and must present as an independent member of a major word class - noun, adjective, or verb. For instance, *defend defense*, *curios*, and *curiosity*. Likewise, Plag (2002) argued that the new lexical items are derivational forms of new word classification, such as nouns, verbs, adjectives, and adverbs. This means derivational suffixes can unlock learners' familiarity with new words from a root or stem. It is greatly influencing learner comprehension to understand and increase vocabulary knowledge.

Intentionally, in order to change the meaning of a root or base word, a derivational suffix is a meaningful component of a word that is added to the end of the word. A derivational suffix gives words their essential structure and meaning in sentences, and it can also change the part of speech, for example, *design* (verb) – *designer* (noun), *careful* (adjective) – *carefully* (adverb)

Table 4 Examples of the most common derivational suffixes

Suffix	Definition	Examples
-ful	full of	careful, joyful
–less	without	fearless, careless
–ment	action, process	enjoyment, treatment
-ly (adverb)	characteristic of	carefully, friendly, happily, loudly, lovely, quickly, slowly, smoothly
-er, or, ist, ian, eer (noun)	someone who; does/what/that /which	eraser, teacher, singer, actor, doctor, artist, cyclist, dentist, librarian, technician, engineer

To conclude, a word's components are a base word or root and its affixes (prefix and suffix). A prefix or a suffix is added to a base word to produce a new word form. A prefix is a word component that is added to a base word or word's beginning, and a word component called a suffix is added to the end of a word. Therefore, learning how

to decode words' meanings is beneficial using their knowledge of prefixes, suffixes, and root/base words.

2.3 Roles of derivational suffix knowledge in vocabulary acquisition and growth

The benefits of derivational suffix knowledge provided a primary essential role in the word family which consisted of root or base words and suffixes. It supports syntactic and semantic vocabulary growth for learners and raises vocabulary knowledge. Mochizuki & Aizawa's (2000) study has revealed stronger relation between vocabulary size and overall affixes, suffixes, and prefixes knowledge posterior study. Schmitt & Meara (1997) proposed to range the number of receptive and productive vocabulary sizes of English learners in Japan, which grows from derivational suffix teaching strategies.

Teaching and learning derivational suffixes strategies demonstrate new words and the different word classes for learners to understand easily. According to Schmitt and Zimmerman (2002, pp. 147), the forming derivational suffix is generally adding the suffix and carrying out the different word classes. To clarify, recalling the combined form of suffixes is the first stage for learners able to comprehend the meaning of words that mix suffixes and roots. For example, the word '*writer*' is composed of a verb, *write*, and added *-r/er* defined new word's class (noun), *writer* which means a person, so it refers to a person who has written a particular text.

There are numerous methods for introducing suffixes to learners to familiarize them with new terms. Learners can easily understand the meaning of the most frequent suffixes by learning from a teacher who helps guide and improve explicit teaching. However, the learning process depends on how teachers generate or plan classroom activities. The duration should be determined, and learners should be given short assessments to evaluate their progress.

Receptive and productive activities of derivational allow learners to solidify their suffix knowledge and hinge on class participation, pairs, group, or whole class activities. Here is some part of the activity "forms" for teaching derivational suffixes, providing a clearer picture of how learners are familiar with vocabulary knowledge acquisition. The examples will be shown as follows: here are some activities suggested by Nation (2013, pp.129-131).

Table 5 A range of activities for vocabulary learning (Nation, 2013: 129-131)

		Activities
Form	**Derivational Suffix**	Filling suffix tables
		Cutting up complex words
		Building complex words
		Choosing a correct form
		Finding etymologies

As an example, consider the term '**Filling suffix table**'. Learners can complete the following tables individually, in pairs, or groups. Not every gap can be filled. Learners are required to classify the assigned word according to its part of speech. As illustrated in the chart below, teachers can ask learners to check their answers with the other pair before revealing the correct answer, as shown in the

Table 6 below

Noun	**Verb**	**Adjective**	**Adverb**
designer	design		
		beautiful	*beautifully*
	care	*careful*	*carefully*
creation	create	*creative*	*creatively*

The learners will be provided with the target word; ensure that the selected words are unfamiliar. Then, give instructions to learners to complete the table. For example, "Guess if it's a noun, verb, adverb, or adjective? ", "Why do you think it's a noun or verb?" and "How do you know that?" can be used as introductory questions to rise learners' interest and encourage them to learn.

'**Cutting up complex words**'; The learners will receive a list of words that have been broken up into sections. The instructor can ask them to explain the significance of some of the components. Students can learn to recognize and define the pieces in this way. The teacher can write the vocabulary on the board and break each word into component pieces, as in remember = *re- + turn*. After that, create another word with the prefix "*re*" and give pupils another chance to practice.

'**Building complex words**'; When given word roots, learners might use them to create negative or ambiguous words (using *-ish*, *-y*, *-able*). The teacher introduces each component's meaning and purpose before constructing the complex terms. At this stage,

learners need to break down the presented word and analyze it: *-ful* serves as a suffix referring to "full of", and *-able* means "can be done". The teacher uses word analysis as an example. After understanding, decoding, and identifying the word pieces, learners are encouraged to make connections and infer the meaning of the complete word based on their prior knowledge. Learners should remember the stem first, then how to add suffixes.

'Choosing the correct form'; Learners are given sentences composed of a blank and a root word in brackets. They would switch the root to the proper inflected or derived form to finish the phrase. For example; am a _____ (design).

The word in the bracket is 'design'; a learner may change the root to the appropriate form

'Finding etymologies'; etymology, usually referred to as lexical change, is the study of the origin or derivation of a word. To understand how new words relate to ones they already know, learners need to check up on the etymologies of words in dictionaries. The teacher introduces the learners to Latin roots through enjoyable activities in this section. These activities, as previously indicated, are beneficial for learners to learn and practice new words. Teachers can use various techniques to present, including word cards, role plays, mimes, word guessing games, pic-to-word, and more. At the same time, if other students or the classroom equipment allows them with devices to connect to the internet, the learners can also encourage the class to learn using technology; for instance, they can use Kahoot to facilitate the games or activities.

In addition to the concept of derivational suffix strategy, there are various techniques for teaching vocabulary. However, English teachers need to educate their learners with new vocabulary to facilitate their ability to recognize new words. Therefore, it should be learned, practiced, and reviewed to prevent forgetting among learners. Each strategy employed by teachers depends on variables such as the subject material, the time available, and the importance of the technique to the learners. This provides teachers with some justification for employing particular strategies when presenting terminology.

Consequently, the derivational suffix technique assists learners in comprehending the meanings of new complex words. In order to expand vocabulary size, it is helpful to connect what is previously understood to what has to be learned.

2.4 Teaching vocabulary

2.4.1 Incidental vocabulary teaching

Incidental learning requires learning one stimulus setting while also paying attention to another. It could come from observations, talking with workers about projects, making errors, or reading a particular text. Furthermore, it is common for learners to expand their word bank (Laufer & Hulstijn, 2001). The readers obtain the wordlist through incidental vocabulary learning will be preserved in long-term memory to employ in a broad range of situations. It should be emphasized that incidental learning is most effective for the proficiency of advanced learners. And also, the methods might be beneficial for second-language learners. However, learning is constrained by its time-consuming, slowly receive grow naturally (Schmitt, 2000:120). This instruction approach may not be suitable for learners to achieve academic goals (Coady,1997:273). Therefore, intentional vocabulary acquisition focuses on deliberate vocabulary and requires learners to overcome these limitations. According to Nation (2001), incidental learning is a key to vocabulary acquisition; this learning occurs without a conscious effort to concentrate on vocabulary. Nation further explains that incidental vocabulary learning involves acquiring a word through hearing, speaking, reading, or writing while paying attention to the text's content rather than the word itself.

2.4.2 Deliberate vocabulary teaching

Deliberate vocabulary teaching has been a widely-used method of traditional vocabulary teaching (Ellis, 2001: 1-46). The particular learning of derivatives is defined by Schmitt (2000:120) as explicit vocabulary learning, which requires an emphasis immediately on and exposure to the learning context. Hulstijn (2003) replied that deliberate vocabulary learning acquires knowing the word using memorizing strategies to recall these lexical items later. Intentional learning typically takes place rapidly, so it is typical for L2 learners to prefer this method over the other. Nevertheless, when they encounter low-frequency words, difficulty emerges as they cannot understand them. Despite Nation's claim (2001: 232) that vocabulary is acquired incidentally, he

maintains that intentional learning contributes to vocabulary learning. In the same manner, such assertion is supported by Schmitt (2000: 121) in that both deliberate and incidental learning is essential, so they ought to be taught. Hence, intentional learning includes learning vocabulary through the use of direct media or materials, such as a dictionary or a wordlist, to capture learners' attention to exposure to the form and meaning of the lexical items. About Nation (2013), the effectiveness of vocabulary learning is determined by the extent to which the learners engage in processing each word. He describes the result of acquiring a word through three cognitive processes: noticing, retrieval and creative (generative) use.

Table 7 Types of repetition of word meaning (Nation, 2013: p.457)

Type of processing	Type of repetition
Noticing	Seeing the same word form and simultaneously presented meaning again
Retrieval	Recalling the same meaning several times
Creative use	Recalling the meaning in different contexts requires a different instantiation of the meaning

Note that this entails directing attention to a particular word and labeling it as an unknown word. This suggests learners need to notice it and recognize its significance. As a result, the learners comprehended that they had encountered the word before, yet it is employed differently. In addition, once they recognize it, they are likely to attempt to decontextualize it, which will serve as the basics for better comprehension of that word. De-contextualization can take place either deliberately or unintentionally in different manners. Such a process may unfold while the learners listen to or read certain materials, when their teachers stress a specific lexical item while talking about its meaning during speaking, or when the teachers attempt to explain lexical items by translation, using synonyms, or to provide their definition in L2.

The researcher noticed the importance of vocabulary teaching, particularly deliberate vocabulary teaching referred to a systematic approach to teaching vocabulary that was planned, intentional, and targeted. It involved selecting words that were important for learners to know and training them in a way that promotes retention and understanding. This could include instruction such as using context clues, providing

definitions, using visuals, and encouraging learners to use the words in their writing and speaking.

Successful cognitive processes were divided into three types of repetition of word meaning. Three processes showed noticing, retrieval, and creative use helped learners may master L2. Thus, the researcher attended suffix instruction, a specific type of deliberate vocabulary teaching focused on studying word parts, specifically suffixes. Suffixes are morphemes added to the end of a base word to create a new word with a different meaning or function. By teaching students to recognize and understand common suffixes, they could more easily decipher the meaning of unfamiliar words.

As noticing concerns directing learners' attention to acquire a word, retrieval enables them to retain or remember its meaning. As Nation (2012) proposed, frequent retrieval of a word during learning will allow the learners to store it more deeply in their memory. Consequently, repetition and retrieval of the word will enable the learners to recognize its definition while being exposed to and using it repeatedly will help them with a deeper understanding of its meaning. For reading, two or three repetitions contribute to the greatest improvement in learning, whereas for listening, five or six repetitions can result in the most extensive improvement (Vidal, 2011). As Brown, Waring, and Donkaewbua (2008) illustrated, the likelihood of acquiring a word increased due to frequent encounters. In contrast, according to Webb (2007), repetitions contributed to developing many aspects of vocabulary knowledge. A minimum of ten repetitions is necessary for acquiring a deep understanding of various facets of lexical items.

Finally, creative use occurs when words earlier encountered are encountered or employed again in manners different from the prior encounter (Nation, 2013, p. 110). As a consequence of these new meetings, learners are encouraged to re-conceptualize their knowledge of those words. As an example, when having encountered the word '*book*' functioning as a noun in "*We bought a book yesterday*" and encountering the sentence "*We booked tickets for a basketball match*" (Evan & Dooley, 2019), learners are required to question the meaning and usage of the word '*book*' in this case. This event will enable learners to remember such a word in their minds. Creative use is not limited to the addition of word meaning, though. It can explain various changes from

inflections and derivations through collocations and grammar to reference and meaning (Nation, 2013).

Thus, according to Tabrizi and Feiz (2016), deliberate vocabulary learning is faster than incidental vocabulary learning in terms of vocabulary tests. Then, to Nation (2013), repetition contributes to vocabulary learning. In language acquisition, frequent exposure to vocabulary or spaced repletion is necessary for language learners. In addition, Elgort (2011) also stated that deliberate vocabulary learning outperforms incidental vocabulary learning because exposure to language input over time is required for incidental vocabulary learning. Naturalistic language learning is unusual in EFL or language learning in other contexts. On the contrary, deliberate vocabulary learning improves learners' vocabulary learning. This situation arises due to focused repetition or memorization strategies, which learners can perform in a short period. Surprisingly, through deliberate vocabulary learning, retention rates are relatively greater than incidental vocabulary learning (Hustijn, 2003). It can be concluded that learning vocabulary deliberately is effective and can enable learners to keep vocabulary in their memory (Nation & Meara, 2010).

2.5. Assessing vocabulary

Assessing vocabulary knowledge is an essential for measuring learners' language competency with regard to vocabulary knowledge. These are the example three types of tests that gives an importance method to assess learners' vocabulary knowledge both receptive and productive provide learners' ability to understand target words in the tests.

The Vocabulary Levels Test

Nation (1983) designed Vocabulary Level Test or VLT to the extent that learners could recognize the form-meaning of the word. The vocabulary level test is updated by Schmitt, Schmitt, & Clapham (2001) with a four-level test: 2,000 words level test, 3,000 words level test, 5,000 words level test, the university words level test, and 10,000 words level test. The whole test will be completed when learners have done all levels or as individual levels. The VLT has presented 30 questions per level to participants matching the word and the correct meaning. It is separated into two columns: the left column contains words, and the right column includes definitions. Each level presents

the words in 10 clusters of six words (three keys and three distractors) and three definitions. The point will be awarded to the participants who respond correctly in each cluster, and the maximum total score will be 30 in each level. These are some examples of the VLT, developed by Schmitt, Schmitt, & Clapham's (2001) versions, in which a noun cluster at the 2000 level in one.

Below is the example of VLT and the score shown below (Schmitt, Schmitt, & Clapham, 2001, pp. 82):

Instructions: Match the words. Write the number of that word next with the correct definitions.

	Target Word	**Definitions**
1.	copy	_6_ end or highest point
2.	event	
3.	motor	_3_ this moves a car
4.	pity	
5.	profit	_1_ thing made to be like another
6.	tip	

The VLT is generally used to focus on high-frequency words, academic words, or low-frequency words. This diagnostic testing examines many aspects of a learner's vocabulary (the 2nd 1000, the 3rd 1000, the 5th 1000, the Academic Word List, and the 10th 1000).

The Word Segmentation Test (WST)

Hayashi and Murphy (2011) designed and developed the word segmentation test (WST) to extent that learners' receptive of a knowledge of word parts. It involves to measure the receptive knowledge of morphological awareness. The word components will be broken down into the smallest parts. The 20 target words are used to assess learners following the derivational suffix instruction. For example, one morpheme part of derivational suffix *believable = believe + able* or two morpheme part of derivational suffix *successfully = success + ful + ly*. All the target words will be chosen from student's text books and derivational suffix will be used from seven level affixes by Bauer and Nation's (1993).

The Suffix Recall Test (SRT)

Nisa (2020) designed vocabulary knowledge through changing forms of derivational suffixes in various functions that identify nouns, verbs, adjectives, and adverbs to measure participants' knowledge of the grammatical functions of a word. It involves

the productive of vocabulary knowledge. The word prompt will be put in different grammatical function to the appropriate situation. For example, he did it …*carefully*... (careful). The prompt word *careful* is an adjective and its changing to *adverb* in appropriate situation.

2.6 The Perception of vocabulary learning

Vocabulary learning was essential to mastering a language and a requirement for effective communication. According to Nation (2001), vocabulary knowledge is a fundamental component of language proficiency, and employing vocabulary effectively is crucial for all language abilities, including reading, writing, listening, and speaking. There has been a significant amount of research on the most effective methods for vocabulary learning. One commonly supposed explicit instruction involves presenting new words with clear definitions and examples, effectively improving vocabulary knowledge (e.g., Hulstijn & Laufer, 2001; Nation, 2001).

Many learners who associate with a method for vocabulary development and explicit instruction revealed a perception of vocabulary learners could vary depending on an individual's background, motivation, and learning style. Some people may find it challenging to learn new vocabulary and feel frustrated or overwhelmed; others may enjoy requiring new words and find it stimulating and rewarding. According to Alharbi (2021), the participants have a positive attitude towards vocabulary learning and use various strategies to acquire and remember new words. The study also reveals some differences in perceptions based on gender and proficiency level. The findings suggest that EFL instructors should consider learners' perceptions and preferences when designing vocabulary instruction.

That vocabulary learning has influenced the effectiveness of learners' perception and is also essential to identify the individual's needs and preferences to design a practical and engaging learning experience.

2.7 Previous studies

Over the last decades, studies of vocabulary acquisition are increased significantly. It has long been held belief that affix knowledge has played a significant role in vocabulary acquisition. It helps learners retrieve the meaning senses of unknown words through receptive (e.g., Hajiyeva, 2014; Hayashi & Murphy, 2011; Mochizuki &

Aizawa, 2000; Nation, 2001, 2013; Schmitt, 2014; Schmitt & Meara, 1997; Sukying, 2017, 2018a, 2020, 2022; Zhang & Sukying, 2021; Zimmerman & Meara, 2002). This section will review previous studies in vocabulary knowledge using the derivational suffix strategy.

The relationship of vocabulary knowledge

Schmitt and Meara (1997) explored the relationship between word association and grammatical suffix knowledge of 95 secondary and university students over one academic year in Japan. The results showed that Japanese learners had poor knowledge of derivational suffixes and that their knowledge of inflectional suffixes was higher than that of derivational ones. Their results also showed that Japanese students gradually developed their knowledge of derivational suffixes. Specifically, Japanese learners increased about 3-5% of derivational suffixes over one academic year. The results also showed the relationship between vocabulary size and receptive and productive derivational knowledge. However, Schmitt and Meara (1997) tested only 14 verbs and did not cover prefixes and other derivational categories. Their findings suggest the importance of teaching and learning derivational suffixes.

In support of Schmitt and Meara's (1997) study, Mochizuki and Aizawa (2000) probed the relationship between affixes and the vocabulary size of 403 Japanese learners at high school and tertiary levels. Nation's (1996) Vocabulary Levels Test was used to tap participants' vocabulary size, and the researcher-made affix knowledge tests were employed to measure knowledge of prefixes and suffixes. The results showed positive relationships between vocabulary knowledge, prefix and suffix knowledge and overall affixes. However, Mochizuki and Aizawa (2000) excluded productive knowledge of vocabulary and affixes. Together, these two studies indicate that more profound vocabulary knowledge promotes a better understanding of English affixes, enlarging students' vocabulary knowledge.

Following Mochizuki and Aizawa's (2000) study, Danilovic, Savic, and Dimitrijevic, 2013) further investigated affix acquisition order and its relationship between vocabulary size and affixes in 62 Serbian EFL university students. They found that the university students' suffix knowledge was higher than prefix knowledge. Although they found a significant relationship between vocabulary knowledge and knowledge of

prefixes, no significant correlations were observed between vocabulary sizes and suffixes. Their findings were inconsistent with Mochizuki and Aizawa's (2000) study that both prefixes and suffixes were related to vocabulary size.

Schmitt and Zimmerman (2002) examined the knowledge of derivative word forms using Bauer and Nation's (1993) word family theory. Sixteen prompt words were used to test nonnative university students' word class knowledge. The results showed that it was difficult for university students to recall and produce all four categories of the target word. Indeed, the study indicated that learners had partial knowledge of derivatives. The participants demonstrated an increased understanding of noun and verb derivatives at each step in comparing derivational mastery and knowledge of the prompt words on a four-stage developmental scale. However, adjective and adverb forms appeared to be more challenging for them. The findings might suggest that teaching derivative forms needs to be prioritized.

Vocabulary teaching

Karliova (2009) explored English vocabulary by teaching Latinate word parts. The participants were EFL undergraduate students given the pre-posttest of Latinate word parts (pre-test and posttest are the same), including interviewing. First-year students received these tests to measure their knowledge of Latinate English vocabulary. However, the treatment on the Latinate word parts to the experimental group. The results showed the experimental group was higher scores than the control group. It implied that Latinate word parts developed English vocabulary and growth.

Hayashi and Murphy (2011) examined the morphological awareness in Japanese English learners. The two researcher-made affix tasks were used to assess participants' morphological understanding, and two existing tests were employed to measure vocabulary knowledge. The analysis revealed the relationship between vocabulary knowledge and morphological awareness. They also found that derivatives were learned after inflectional suffixes. Hayashi and Murphy (2011) further pointed out that Japanese learners' morphological awareness was heavily reliant on explicit classroom instruction. The study also highlighted the close relationship between morphological awareness and vocabulary size among Japanese learners. Their results align with

previous findings that both receptive and productive knowledge of morphology was correlated with vocabulary size (Schmitt & Meara, 1997).

Kim Cholo (2013) compared two types of vocabulary learning: learning prefixes and suffixes formally and learning incidentally without using the knowledge of affixation. This study was carried out over ten weeks. The participant included 54 university students in Korea. The author used pretest and posttest to see the results of both vocabulary learning. The results found that students who learned through affix knowledge could memorize more vocabulary and know the meaning faster than the other group. In another experiment, Melissa Jean Cook (2016) examined the effects of games and songs on learning about affixes, including prefixes and suffixes, among third-grade students. The study used mixed-method research, drawing on quantitative and qualitative research paradigms. The findings showed that learning about affixes through games and songs was very helpful and supported students' motivation. However, the study included only a small group of participants.

In the Thai context, Ward and Chuenjundaeng (2009) investigated the acquisition and application of suffix knowledge using word families as a counting tool. The L2 learners were divided into two groups of EAP students in a Thai university and collected the data through word part analysis. The results of this study revealed that using word families as a counting tool leads to misunderstanding conclusions, especially with lower learners' proficiency. It was also shown gradually develop from the base word, the most frequently occurring word, to derived forms of the word. In addition, the results indicated the influence of exposure in suffix learning and that some forms of derivational suffixes were acquired before others.

Furthermore, Sritulanon (2012) studied the effects of morphological instruction on reading abilities of low proficiency adult EFL learners at a university in Thailand. The participants were measured by using morphological knowledge to guess the meaning in reading comprehension. However, the results had not shown differences between pre-post scores in both the experimental group and the control group. These supposed that learners' final score was not better in vocabulary knowledge and reading comprehension. The effect replied to two aspects, the first one might be relevant to low-proficiency learners that the affix knowledge could not help with vocabulary knowledge

and reading comprehension in terms of limited words 2,000 – 3,000. Finally, morphological instruction and extensive reading through reading exercises may have helped low-proficient readers.

Sukying (2017) investigated the relationships between receptive and productive affix knowledge and vocabulary size. The 486 Thai EFL participants were measured with the two existing vocabulary size tests and three different measures of affix knowledge. The results illustrated a positive relationship between learners' receptive and productive affix knowledge and their growth receptively and productively in vocabulary size. The findings also showed that receptive affix knowledge improves productive affix knowledge and that receptive and productive affix knowledge increases vocabulary size. This indicates that affix learning is essential for vocabulary acquisition and growth. Affix knowledge is incrementally acquired at different speeds and varying degrees.

Building on Sukying's (2017) study, Sukying (2018b) investigated English affix knowledge acquisition in L2 learners. This may acquire learners to know another member of the word family, 32-word families. Productive knowledge is the relationship between L2 learners' productive affix knowledge and their vocabulary in a Thai university context. The results showed that the participants rarely recalled all forms of the word family. However, the participants did not complete the word family and incremental knowledge successfully. The implication of these findings revealed pedagogical strategy and theory. Sukying (2020) further explored the effects of affix instruction on acquiring a word. The receptive and productive affix knowledge measures were administered to 92 participants. Participants in the treatment group were provided explicit instruction on English affixes (Bauer & Nation, 1993), while the participants in the control group were not. The results demonstrated a positive effect of affix instruction in English language classrooms. Specifically, the affix features involving linguistic and semantic transparency increased participants' receptive and productive performance. The study highlighted the significance of the explicit teaching of English affixes and their role in vocabulary acquisition and development. Sukying (2022) later suggested a five-stage order of English affix acquisition by studying high

school learners in Thailand. His findings yielded fruitful pedagogical implications for language classrooms.

Bubchaiya and Sukying (2022) used the word part strategy to improve primary school students in Thailand by using researcher-made tests to assess the participants' knowledge of word parts. The study showed that experimental participants outperformed the control peers, indicating the positive effect of word part instruction on vocabulary learning. The findings also suggested a high level of satisfaction with learning vocabulary through word part strategies. A cross-sectional study highlighted the relationship between morphological awareness and word knowledge among 104 primary school children in Thailand (Sukying & Matwangsaeng, 2022). This study also pointed out that primary school children acquired different morphological items at different speeds and developed their morphological awareness as their education level (exposure) increased.

In conclusion, the literature review has shown that morphological awareness, or derivational suffixes used to operationalize the current study, has played a significant role in vocabulary acquisition and growth. However, little attention has been paid to the effect of affix knowledge on the basic educational level, especially in the Thai EFL context, where the study collected data from the participants who were studying in grade eight, in 2022, at the local high school in Surin, Northeastern, Thailand. Learning common derivational suffixes can aid in comprehending the form and meaning of new words and applying them in context clues, according to the researcher's methodology. The classroom activities illustrated the connection between noticing, retrieval, and creative use. These learners' familiarity with complex words, such as notice, assists them in remembering the word. Retrieval allows them to re-conceptualize and creative use due to relating the grammatical functions that would be added in the context. These fill the learners' level gap that derivational suffix instruction affects vocabulary knowledge.

Therefore, the current study will further investigate the impact of affix knowledge with an emphasis on derivational suffixes. It is assumed that derivational suffixes help learners facilitate their vocabulary learning and growth. It is also expected that the

current study will shed light on the role of affix knowledge in vocabulary acquisition and development.

2.7 Chapter summary

This chapter conceptualized vocabulary knowledge and word family theory. The literature review pointed out that derivational suffixes have significantly developed learners' vocabulary knowledge. The literature analysis also indicated that the notion of word families has long been perceived as the central organizing unit for teaching and learning vocabulary (Bauer & Nation, 1993; Schmitt, 1997; Mochizuki & Aizawa, 2000; Sukying, 2017, 2018a, 2018b, 2020, 2022, Zimmerman & Meara, 2002). Accordingly, the current will take up the quasi-experiment study to further investigate the effect of derivative forms on vocabulary development among secondary school students in a regional area of education in the northeastern part of Thailand. The following chapter will present the research methodology of the study in detail.

CHAPTER III
RESEARCH METHODOLOGY

This chapter presents an overall description of the research methodology of the current study. The chapter begins with the research design (see 3.1). This follows context and participant (see 3.2), the research instruments (see 3.3), and the research procedure (see 3.4). The chapter ends with a comprehensive briefing of the current study (see 3.5).

3.1 Research paradigm and design

Quantitative research fundamentally involves quantification, numbers and statistics (descriptive and inferential statistics) to address a research problem or objective. It usually requires a large sample size. This quasi-experimental study aimed to examine the causal-like relationship between variables. The independent variable is derivational suffix instruction collected both receptive and productive derivational suffix knowledge tests. It is also believed that an object of inquiry cannot be understood with complete accuracy. Instead, it is believed that objectivity is a regulative principle that reminds the researcher to be aware of potential influences of their personal bias or values and those of others involved in a research setting on research outcomes (Phakiti, 2015).

It known that the current study did not have complete control over all the variables that could affect experimental research outcomes. This was partly because language learners and the nature of learning and context were highly complex. Indeed, this study employed a quasi-experimental design to understand aspects of language learning amongst Thai high school learners. Subsequently, this study used two intact classes: one was an experimental group, and the other was a control group. The control group had no treatment, in contrast with the experimental group. Indeed, both groups of participants received general English classes. The only difference between the groups was that the experimental group received two hours of instruction on derivational suffixes a week. In contrast, the control participants received no extra instruction on derivational suffixes. The underlying reason for manipulating the variable was to examine the relative effect of explicit instruction on derivational suffixes as to vocabulary growth. The pre-and-post tests were administered to measure the impact of derivational suffix instruction throughout the experiment. Table 8 illustrates the research design of the current study.

Table 8 Research design

Group	Vocabulary tests	Length of treatments (13 weeks)	Vocabulary tests	Learners' perception
Experimental (*N=29*)	√	General English + derivational suffixes	√	√
Control (*N=29*)	√	General English + No derivational suffixes	√	

3.2 Context and participants

3.2.1 Participants and setting

The current study collected the data at a local high school under the government administration in northeast Thailand. Fifty-eight EFL high school learners voluntarily participated, then the age ranges from 14 to 15. They were divided into two groups, with 29 learners in each group. They were in a similar context, as well as similar students' textbooks, and studied at the same school where the researcher worked. It remained convenient for conducting the treatment and collecting data. The vocabulary size test developed by Schmitt (2000) was also used to assess the learners' vocabulary size, indicating that they had a small vocabulary size. Thus, their English language abilities were around A1 and lower levels based on CEFR proficiency according to the English course they were taking at school at the time of the study. The vocabulary size test Schmitt (2000) developed was also used to assess the learners' vocabulary size, indicating that they had a small vocabulary size.

The data were collected in the classroom based on two groups: the experimental group, which taught derivational suffix strategies, and the control group, which did not have any given explicit teaching in derivational suffix strategies. The researcher only gave them vocabulary and guessed the meaning by themselves. The participants generally used L1 (Thai language) to communicate with their friends. The participants were taught by the researchers, 60 minutes of English sessions by switching techniques, mainly using their mother tongue (L1) rather than L2, to save class time and understood better while doing activities in the class.

Furthermore, the Thai EFL participants were in grade eight and typically study English as part of their school curriculum, provided that all Thai EFL learners study English as a mandatory subject. Thus, participants were given a minimum of 1 year to learn English in high school and six years in primary education. The participants were familiar with the English language, whether vocabulary and grammar structure, involved with accessing English language media resources, for instance, the internet, news articles, movies, radio, smartphones, and intelligent television, would help them unrestricted. At the same time, the teacher frequently used English materials for teaching in the classroom.

3.3 Research instruments

The instrument of this study consisted of three tests and twelve items of questionnaires. The tests were the Word Segmentation Test (WST) and Suffix Recall Test (SRT). The tests were developed based on the theoretical framework of Nation (2013). Detailed descriptions of each test are as follows:

3.3.1 The Word Segmentation Test (WST)

WST measured receptive knowledge of word form, specifically, knowledge of suffixes (Hayashi & Murphy, 2011). This test included 20 items. WST needed participants to break down words' components (derivational morphology) into smaller morphemes and the smallest parts of a language. For example, e.g., *jump* (verb) → *jumper* (noun) + *-er* (suffix). The word "*jumper*" was segmented into smaller morphological parts through analysis of semantic transparency. Furthermore, the test also measured participants' understanding in the form of derivational suffixes. The participants received one point for the correct answer in one morpheme and no point for incorrect in such one wrong root word or no answer. The researcher used English derivational suffixes based on Bauer and Nation's (1993) word family criteria and word lists from the student's book 'Access 2' developed by Verginia and Jenny (2019). The test designs were slightly adapted based on Nontasee and Sukying (2021). The word segmentation's scoring is shown in Table 9.
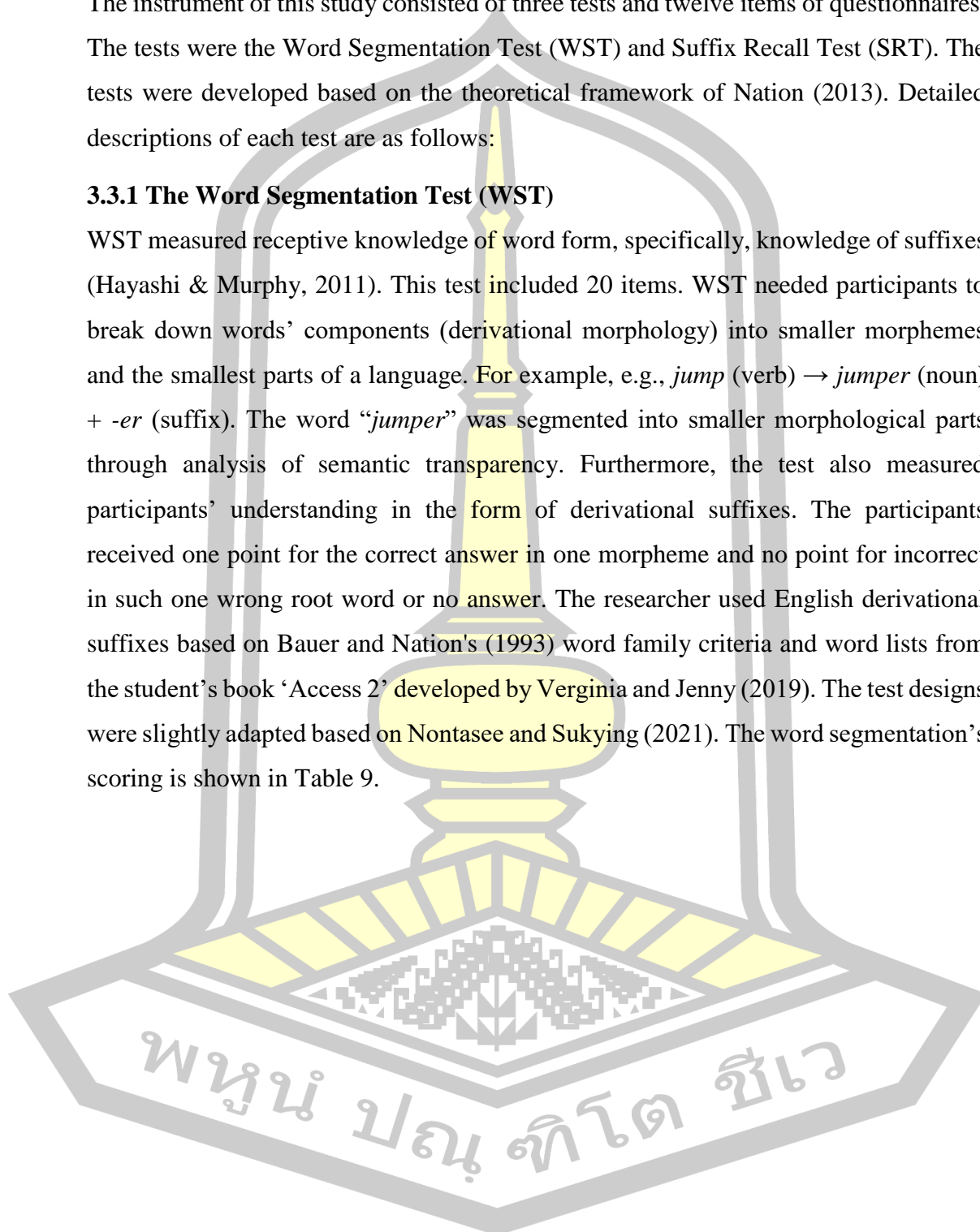
Table 9 The Word Segmentation Test Scores
Instructions: Break down a word into the smallest parts. (**คำชี้แจง** ให้นักเรียนแยกส่วนประกอบของคำที่กำหนดให้)

Word's breakdown	Scoring
1. beautiful = beauty + *ful*	2
2. beautifully = beauty + *ful* + *ly*	3
3. beautify = bau + *notify*	0

3.3.2 The Suffix Recall Test (SRT)

The test was intended to measure participants' productive knowledge and write awareness of word use by changing forms of derivational suffixes in various functions that identify nouns, verbs, adjectives, and adverbs. Nisa (2020) indicated derivational suffixes that did not only change form but function, for example, to change the form of a verb into a noun; attend → attendance. Hence, the test provided gap filling to put the derivational vocabulary in the prompt word into correct classification (noun, verb, adjective, and adverb); e.g. She is a……. (beauty) girl (beautiful). This test comprised 20 items. The test's points were awarded after learners put the correct words in the correct categories and no points for the words with incorrect categories. The test designs were based on Nontasee and Sukying (2021). The scoring criteria for this task are shown in Table 10.

Table 10 The Suffix Recall Test Scores
Instructions: Write a correct form of a word in the blanket for each blank in the sentence and choose an appropriate classification for the word you provided. (**คำชี้แจง** นำคำศัพท์ที่กำหนดให้ในวงเล็บเติมลงในช่องว่างให้ถูกต้อง พร้อมระบุชนิดของคำ)

Context	Point	Classification			
		N.	V.	Adj.	Adv.
She is a …*beautiful*... (beauty) girl.	1			×	
She is a …*beautiful*... (beauty) girl.	1				×

3.3.3 The questionnaire

The current study adapted the questionnaire developed by Sukying (2020). It aimed to measure participants' perceptions of vocabulary learning through word parts instruction. The score was analyzed from 29 experimental group participants. The questionnaire employed twelve slightly adapted questions written by Sukying (2020). The 12 questionnaire items related to learners' perceptions about the effect of derivational suffix instruction on English vocabulary in Thai high school learners. There was English and Thai version to ensure that students could cover and understand the information. Participants were asked to rate their views the teaching methods according to a 5-point Likert scale: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, and (5) strongly agree.

3.4 Research procedure

3.4.1 Selecting the prompt word for the current study

Selecting words for learning regarded as a major concern for teachers, materials writers and researchers (Nation, 2013, Read, 2004). Besides, L2 research showed that high-frequency words, in a general sense, were words that frequently appeared in all types of spoken and written texts, regardless of the specific contexts (Laufer, 2014; Nation, 2013; Nation & Webb, 2011). Without knowledge and fluent access to these words, students would suffer in L2 comprehension and production (Nation, 2013, 2016). Thus, high-frequency words should be prioritized in teaching and learning, especially for lower-level learners (Laufer, 2014; Nation, 2013). The current study employed Laufer and Nation's (2012) proposed selection criteria for vocabulary teaching, which included frequency, usefulness and difficulty (learnability). However, the prompt words in this study were chosen from the student's book 'Access 2'. The vocabulary ranged from the book's units. Specifically, the criteria for selecting the word prompts are:

1. The teacher studied the primary English language objects and analyzed the aim of vocabulary selection.
2. The prompt words were selected to cover all the units from the book. The prerequisite to selecting words was that a minimum of two suffixes was added to each prompt word and changed parts of speech, nouns, verb, adjectives, and

adverbs. The proper and collective nouns and compounds were excluded. The total number of selected word prompts was 66.

3. The researcher checked 66 words against the New General Service List (NGSL); only 63 remained (Browne, Cullingan, & Phillips, 2013). The vocabulary based on NGSL involved approximately 2,000 high-frequency words for learners in second language acquisition and covered 92% of general English texts. Therefore, the worth of word list was suitable for learners of second language knowledge. However, learners were required to know the word's meaning.

4. After checking 63 prompt words, the researcher piloted with the participants in different groups with a similar context to select the known and unknown meanings of the words. The 60 minutes were acquired to help participants finish to vocabulary pilot.

5. After the vocabulary checklist was piloted, the participants' least and most known words were excluded, as reported by the participants. However, all 63 prompt words were selected for teaching in the classroom.

6. Finally, the researcher designed the tests and the lesson plans. The lesson plans varied from 13 hours of derivational suffix instruction.

The list of prompt words includes 66, carefully checked against the New General Service List (NGSL). The final list consisted of 63 words:

adventure, *bank*, *believe*, *bright*, *care, clear, clean, correct, contact, danger, develop, education, environment, emotion, entertain, final, happy, harm, hard, high, heart, joy, kind, large, love, light, material, mind, modern, moral, move, national, natural, peace, profession, pain, plant, play, power, present, rich, romantic, print, pure, quiet, real, sad, sharp, smoke, social, skill, sense, strange, success, smart, thank, time, tradition, transport, use, waste, weight* and *wet*.

To summarize, the final list of the prompt words was applied to lesson plans for classroom practice. However, only 20 words were included in receptive and productive vocabulary knowledge measures. The criteria for selecting the prompts for the test were based on the members of word families; that is, a minimum of 6 members within the word families was included in the test. This was based on the average member of word

families (Nation, 2006). The 20 words included: *modern*, *present*, *harm*, *mind*, *love, joy, final*, *develop*, *use*, *social*, *play*, *real*, *national, profession*, *care*, *peace, pain, moral*, thank, and *power*

3.4.2 Selecting the target derivational suffixes

Note that derivational suffixes were essential for mastering grammatical functions in language use. The derivational suffixes typically assign syntactic and semantic relations with the word and generate forms of a lexical item in different grammatical categories (Sukying, 2018a). The study used Bauer and Nation's (1993) word family model to select the target suffixes. It was assumed that learners did not strive to learn different lexical forms separately if they were within the same word family. In this regard, derivational suffixes used in the current study included derived forms of Levels 3 (the most frequent and irregular derivational affixes) and 4 (frequent orthographically regular affixes).

The reason for using Levels 3 and 4 was that these derivational suffixes frequently occurred in the textbook ('Access 2'), which was used for English courses at a school. Moreover, the derivational suffixes listed in Levels 3 and 4 were regarded as a basis for the methodical learning and teaching of English and were widely accepted for word-building devices (Bauer & Nation, 1993; Sukying, 2017, 2018a, 2020, 2022). In addition, concerning the Thai National Curriculum, all target suffixes employed in the current study were adequately common, and high school students in Thailand might be expected to know them, at least partially known (Sukying, 2017). However, the study excluded Level 1 (each form is a different word) mainly because of the assumption that students tended to consider *student* and *students* to be related or members of the same word family (Sukying, 2017). The current study also excluded Levels 5 to 7 because these affixes (prefixes and suffixes) infrequently no occurred with the target words of the study. Therefore, the target derivational suffixes used in the study consisted of 13 derived forms, including *-able, -er, -less, -ly, -ness, -al, -ation, -ful, -ism, -ist, -ize/-ise, -ment, -ous.*

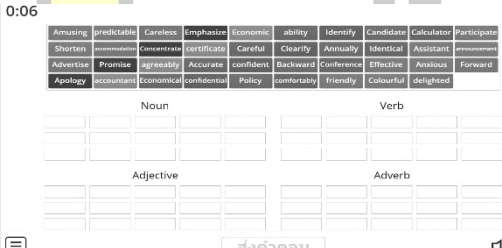### 3.4.3 Lesson plan: Principles of suffix instruction

Teaching instruction was designed appropriately in one hour, including topic, objective, time, level, activity, materials, teaching procedure, and evaluation. The detail in the

derivational suffix instruction step was showed in Table 11 and the planning teaching step also showed in Figure 1. Similarly, the suffix instruction included, *-able, -er, -less, -ly, -ness, -al, -ation, -ful, -ism, -ist, -ize/-ise, -ment, -ous* were applied in classroom activities. Participants were also studied in parts of speech, including nouns, verbs, adjectives, and adverbs, to engage participants' motivation based on activities.

Table 11 shows some examples of derivational suffix instruction applied in the classroom activities for the experimental group.

Table 11 An example of derivational suffix instruction and activities

1. Topic	Derivational Suffix
2. Objective	To identify the meaning of suffixes
	To identify the classification of the suffix
3. Time	60 minutes
4. Level	Grade 8
5. Activity	• Filling suffix
	• Matching (cutting up complex words & building complex words)
	• Choosing a correct word (put it in the contexts)
	• Finding the word
6. Material	1. Worksheet
	2. PowerPoint
7. Teaching Procedures Warm-up (10 Mins)	1. The participants were divided into 6 groups by randomly.
	2. The words were showed on the smart TV and participants saw a common word (*carefully, rainy*).
	3. The researcher asked a classroom representative to write the common word on the board (*-ly, -y*).
Presentation (Noticing) (10 Mins)	4. The researcher explained the objective to the participants.
	5. The researcher introduced the suffixes '*-ly, -y*' and their meaning and then provided more examples.
	6. All participants are asked to pronounce each word together, then each group was asked, then each individual for being remember the words.
Practice (Retrieval) (10 Mins)	7. The researcher assigned participants to complete the worksheets individually. The worksheet required participants to match, filling and choosing the words with the given definitions in 7-8 minutes.

	8. The researcher told participants to switch their worksheets with their friends to check if it is correct. Then, the researcher asked a participant randomly to say the answer (1 item = 1 point, totaling 10 points).
Production (Creative use) (30 Mins)	9. The researcher gave every group a piece of paper and asks them to find as many words as they can that begin with '-*ly, -y*' in the Access 2 book Grade 8 in 5 minutes. 10. When the time was up, the researcher asked a representative of each group to write the vocabulary on the board. Then researcher checked whether or not the response was correct. The winner was the group that identified the most words ending with '-*ly, -y*'. 11. Let participants pronounced each word together and spell the words. 12. Have participants play the game 'Wordwall' in the group. Learners need to help each other analyze the words (nouns, verbs, adjectives, and adverbs)
Conclusion (5 Mins)	14. The researcher reviews all vocabulary they learn, emphasizes the suffix, and parts of speech 15. Give participants compliments to encourage them to learn English.
8. Evaluation	From worksheet: Matching words with the definitions. Scoring is as follows: 9-10 points = Great 7-8 points = Very good 6-7 points = Good Less than 5 points = Try harder!
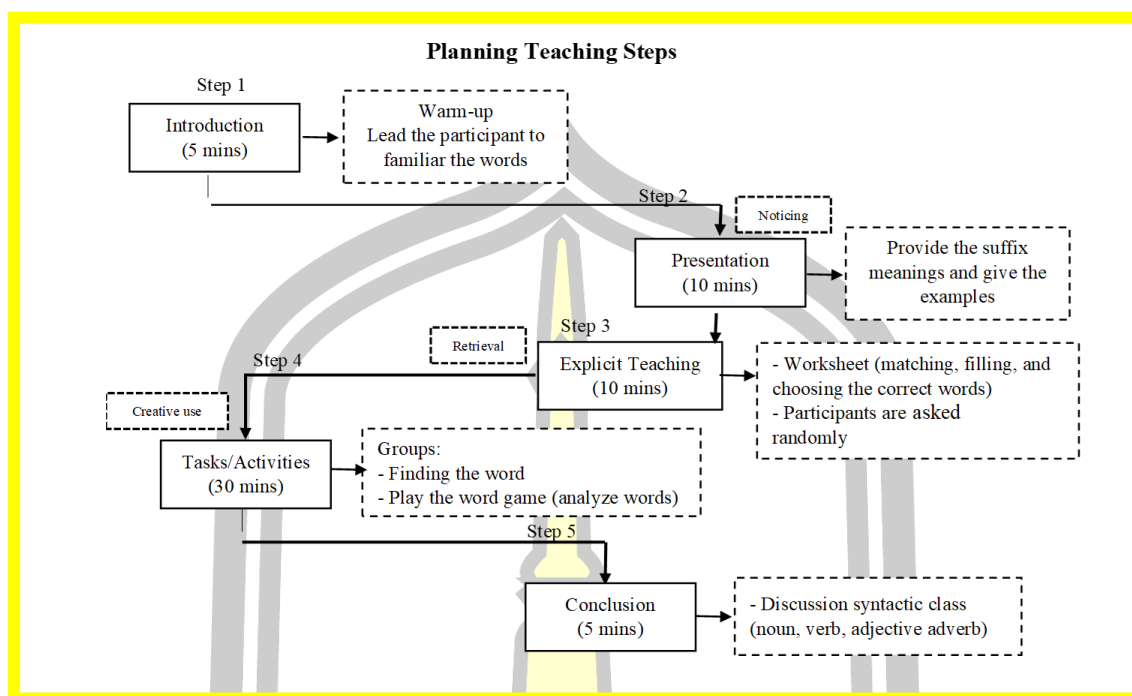
Figure 1 Teaching Demo

3.4.4 Data collection procedure

The data collection period was approximately three months in the classroom context, and three different tests collected the data on different days. Primarily, 'form' could be changed to the other aspects of word knowledge (Nation, 2001; Web, 2005; Laufer & Goldstein, 2004; Sukying, 2018; Sukying, 2022), and ending with 'use' knowledge that learners acquired in L2 (Nation, 2001; Nontasee & Sukying, 2021). The experimental and control groups were given a pre-test, a segmentation word test, and the suffix recall test for the first test. After pre-testing, the two groups received different teaching instructions. The experiment lasted 12 weeks, with an average of two hours a week.

The experimental group received explicit instruction on derivational suffixes. That is, the participants were introduced to the concept of Bauer and Nation's (1993) word families. Furthermore, the participants were taught morphologically complex words according to the concept of word building through suffixes derived from Bauer and Nation's (1993) word family model. Specifically, the participants were trained to form a more complex word by adding suffixes to the base word (e.g., break + -able = breakable). The participants were also taught how to break words into smaller parts (e.g., scientist = science + -ist).

By contrast, the control group received regular English classes, but they did not receive any special training regarding the derivational suffixes. Instead, they learned general English through a grammar-translation approach. Notably, the participants were taught grammar and the meaning senses of the words directly. To sum up, both groups received an average of two hours of English classes a week. The only difference was that the experimental group received special training on derivational suffixes based on the principles of word families, whereas the other group did not receive any. After the lessons were completed, participants were given a posttest. Then, the experimental group was requested to do the questionnaire. The data were collected from 29 participants. The questionnaire slightly adapted twelve questions written by a Thai researcher, Sukying (2020). The English version was translated into Thai and back-translated to check whether the translation was accurate. This method allowed the researcher to see whether the original meanings had changed (Phakiti, 2014). The Thai version of the questionnaire was used to collect the experimental group participants' perceptions towards the instruction of derivational suffixes in vocabulary learning. The Thai version was employed mainly to avoid language barriers.

Table 12 demonstrates the data collection procedure.

Group	Time 1 (Pretest)	Teaching period	Time 2 (Posttest)	Time 3
Experimental	VLT WST SRT	General English lessons + derivational suffixes	VLT WST SRT	Questionnaire
Control	VLT WST SRT	General English lessons	VLT WST SRT	x

3.5 Establishing the reliability and validity of the tests

The test validity and reliability of the content, including questionnaire, were assessed by three experts in English education who had taught English to Thai EFL learners, two from university and the others from high school. The experts' opinions described the rating scale as follows:

+1 = The item is appropriate

0   =   Not sure

-1   =   The item is not appropriate

Item-Objective Congruence (IOC) measures the consistency of the test's items.

$$IOC = \frac{\Sigma R}{N}$$

IOC means   the index of congruence

R   means   the total score from the experts' opinion

N   means the number of experts

The two tests and the questionnaire were evaluated by the experts. The items which received IOC higher than 0.5 were retained, but those lower than 0.5 were excluded. After evaluating the tests and interviewing questions succeeded, the researcher received comments from the experts.

Before collecting the data, the research instruments were piloted by 30 participants were different cohorts, and they were from the other school near the researcher's school area. However, they were similar in background context and characteristics regarding educational background. The participants in piloting needed to complete the tests (WST and SRT). The score was interpreted and analyzed to measure internal consistency reliability. The p values were used to see the item difficulty, and it should typically range between .20 to .80, with an average value that may vary depending on the purpose of the exam. All items in both tests were appropriate in terms of difficulty (See Appendix 4). Item discrimination (r-value) was also calculated to see how performance on the item differs or discriminates between a high-scoring group and a low-scoring group (See Appendix 4). SPSS seems to get Cronbach's (1951) alpha coefficients for the instrument results. Cronbach's > 0.70, Nunnally's (1978) widely recognized social science criterion, was used to measure the scales' reliability. According to Nunnally and Bernstein (1994), Items with a correlation of $\leq$ r.30 to their scale should be maintained. If deleted data were then examined, Cronbach's Alpha to identify any more possible issues by determining whether any of the values exceeded the alpha reliability estimate for its factor. If Cronbach's Alpha deleted value exceeded its factor, the item's removal would enhance reliability. If an item was deleted, any items highlighted by Cronbach's Alpha were evaluated, and if they made substantive sense, the item was extracted. The

experts were also asked to evaluate all the tests and questionnaire items regarding the test validity. All validity, construct, face, and content were carefully checked.

3.6 Data analysis

To analyze the scores on the word segmentation and suffix recall tests, used SPSS to conduct paired samples *t*-tests and independent-sample *t*-tests. The *t*-tests assessed the learners' learning vocabulary ability before and after teaching derivational suffixes or regular class instruction. Specifically, two means of the same group of participants were compared before and after a treatment condition using a paired-samples t-test (Field, 2009).

In addition, the questionnaire would provide the scores from fixed rates on a 5-point Likert scale. This provided the item's rating to assess participants' perception of the derivational suffix instruction, which affected vocabulary knowledge acquisition in L2. Then, the data were analyzed using descriptive statistics (SPSS). The interpretation of the mean score was adapted from Landell (1997) is:

Agree	4	points
Neutral	3	points
Disagree	2	points
Strongly disagree	1	point

The result of the questionnaire was interpreted in the following range

4.50 – 5.00	=	Very high
3.50 – 4.49	=	High
2.50 – 3.49	=	Moderate
1.50 – 2.49	=	Low
1.00 – 1.49	=	Very low

3.7 Chapter summary

This chapter outlines the methodology of the study. It includes research design and approach, participants and setting, research instruments and data collection procedures follow. The chapter also provided information regarding the data analysis and related

statistics. The chapter ended with a summary. The next chapter will present the findings of the study and a preliminary discussion of the findings.
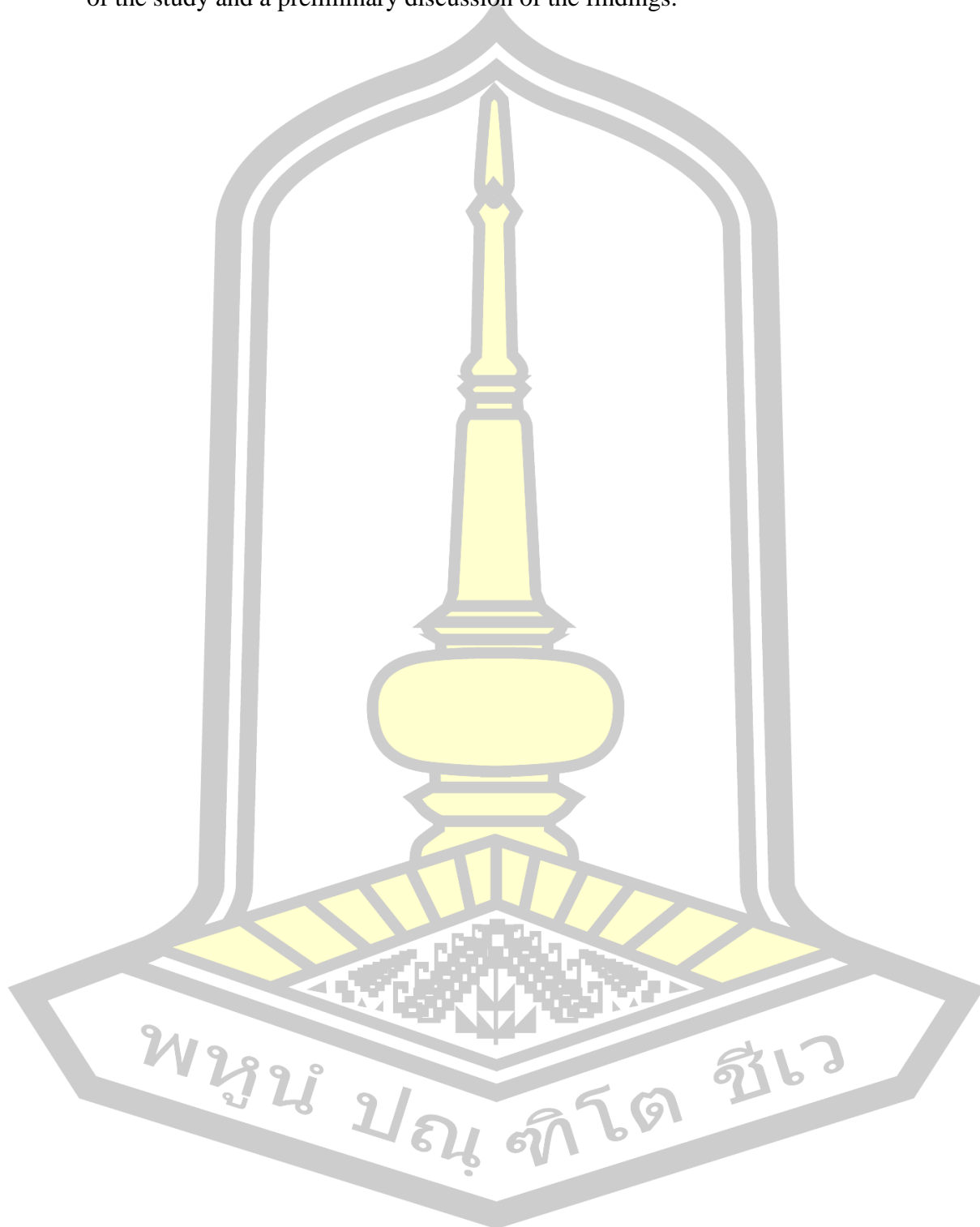
CHAPTER IV
RESULTS OF THE CURRENT STUDY

This chapter presents the results of the study through the analysis of descriptive and inferential statistics to answer research questions that explore the effect of derivational suffix instruction on Thai high school learners' English vocabulary learning. It also seeks to investigate their perceptions of derivational suffix instruction.

4.1 The effects of derivational suffixes on English vocabulary knowledge

This section addresses how derivational suffix instruction affects vocabulary learning in Thai high school learners. Two measures were used to assess the participants' knowledge of derivational suffixes. Both experimental and control groups were given the tests at pre-and-post-intervention times. The quantitative data were analyzed using descriptive and inferential statistics. Summary descriptive statistics for the derivational suffix knowledge tests are presented in Table 13. The results showed that participants in both groups performed better on the receptive knowledge test than on productive knowledge measures at all tests. Specifically, the experimental group participants achieved a mean performance of 47.20% on the WST (SD=3.62) before the intervention, whereas the control participants obtained a mean performance of 46.85% (SD=2.21). The experimental participants achieved a mean performance of 16.85% (SD=3.83), whereas the control participants got a mean performance of 17.05% (SD=1.49) on the SRT. Other relevant figures are illustrated in Table 13.

Regarding the productive knowledge tasks, the results showed that the experimental participants obtained a mean performance of 16.85 on the SRT (SD=1.49) before the intervention, whereas they gained a mean performance of 33.25% (SD=2.02). However, the control participants obtained a mean performance of 17.05% (SD=1.32) before the intervention, while they scored a mean performance of 17.05% (SD=1.18) on the SRT after the intervention. Together, these findings indicate that derivational suffix instruction positively affects vocabulary learning in Thai high school participants.

Skewness and kurtosis figures were also conducted, indicating that they were within the statistical assumptions of normality of two standard deviations. Furthermore,

skewness and kurtosis values were shown around ± 1 and ≤ 2 (Hill, 1998), which was verified to be a normal distribution. Then, there was no violation of the statistical assumption.

Table 13 A summary descriptive statistics for the derivational suffix knowledge tests

	Times	Tests	*M*	(%)	*SD*	Skew	Kurtosis
Experimatal group (*n* = 29)	Pretest	WST	9.44	47.20	3.62	0.46	-0.96
		SRT	3.37	16.85	1.49	1.27	1.69
	Posttest	WST	13.13	65.65	3.83	0.38	-1.15
		SRT	6.65	33.25	2.02	1.70	5.22
Controlled group (*n* = 29)	Pretest	WST	9.37	46.85	2.21	-0.22	0.29
		SRT	3.41	17.05	1.32	1.34	2.02
	Posttest	WST	10.34	51.70	2.63	0.21	-0.62
		SRT	3.41	17.05	1.18	0.92	0.97

A paired-samples *t*-test analysis was also performed to determine whether there was any significant difference between the derivational suffix knowledge tests before and after the treatment in the same group of participants. Effect size (*d*) analysis was also used to calculate the strength of vocabulary learning.

Table 14 Comparisons between pretest and posttest

	Pretest		Post-test	*t*-value	Effect size (*d*)
Experimental group (*n* = 29)	WST	*VS*	WST	12.55***	0.99
	SRT	*VS*	SRT	17.10***	1.85
Controlled group (*n* = 29)	WST	*VS*	WST	2.82**	0.40
	SRT	*VS*	SRT	0	0

Notes: ***p < 0.001, **p < 0.01

As shown in Table 14, based on the scores of the experiment-group participants, the two times (pretest and post-test) of the reception test of derivational suffix knowledge (WST) were significantly different, indicating a large effect size ($t = 12.55$, $p < 0.001$, $d = 0.99$), and the two times (pretest and post-test) of the production test of derivational suffix knowledge (SRT) were also statistically different, revealing a large effect size ($t = 17.10$, $p < 0.001$, $d = 1.85$). In contrast, the results of the controlled group only showed that there was just a significant difference between the pretest and post-test in the reception test (WST) with a small effect size ($t = 2.82$, $p < 0.01$, $d = 0.40$).
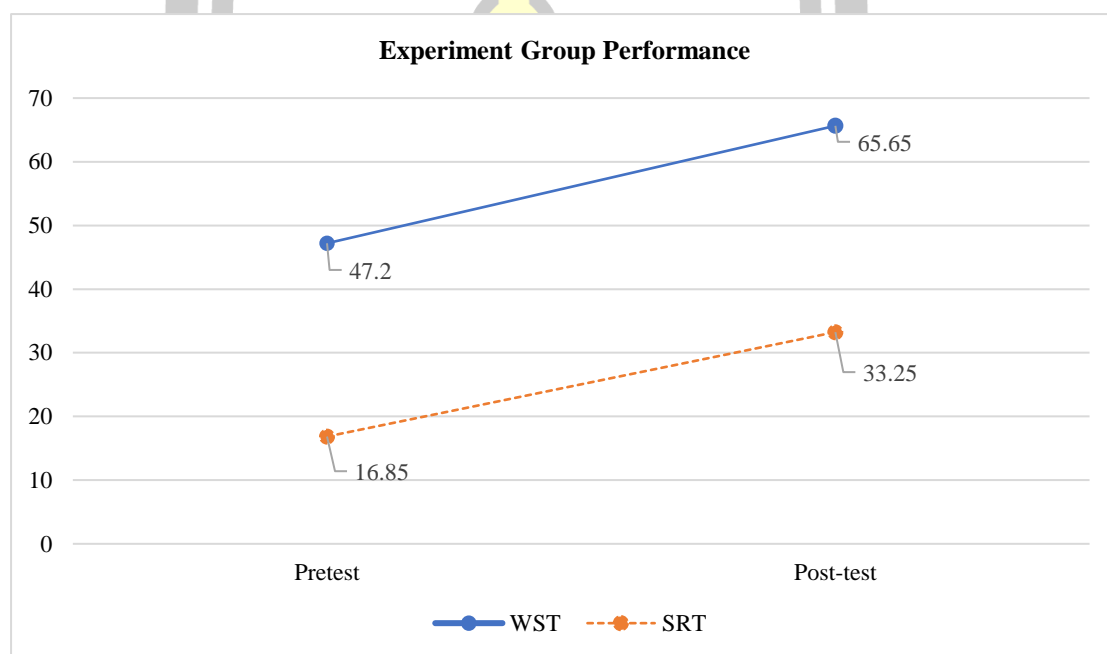
Figure 2 Experiment group performance

Figure 2 illustrates the summary of the paired-samples t-test analysis of the experimental group performance. The analyses of the results showed that receptive and productive knowledge tests of derivational suffixes were significantly different with large effect sizes at both pretest (WST versus SRT; $t = 10.81$, $p < 0.001$, $d = 2.19$) and post-test (WST versus SRT; $t = 10.79$, $p < 0.001$, $d = 2.12$).
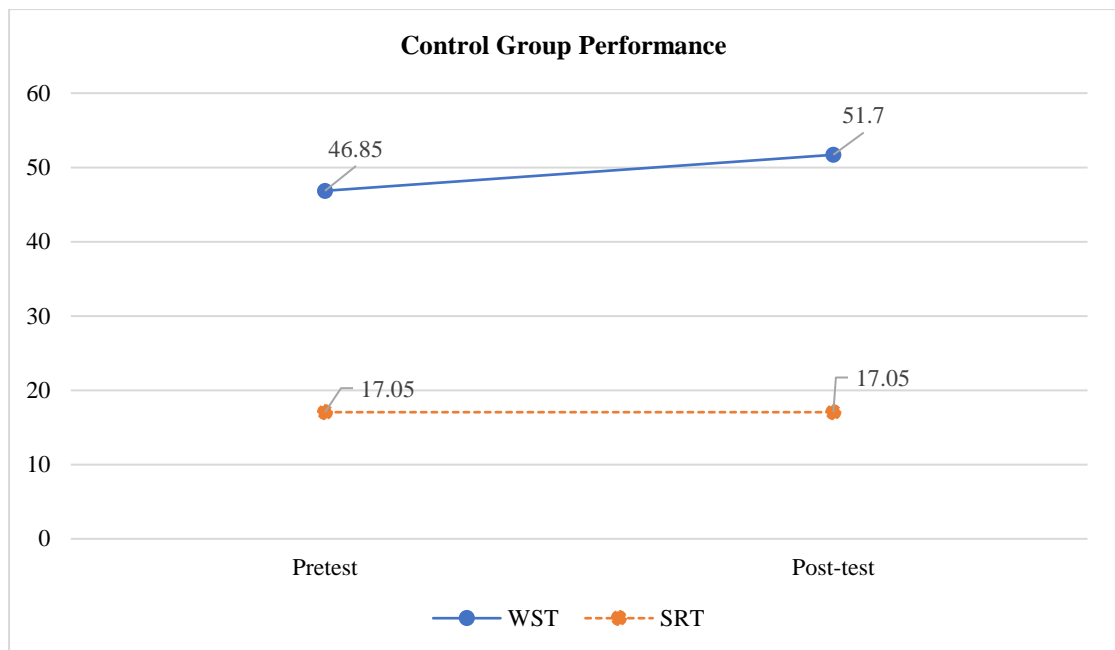
Figure 3 Control group performance

Figure 3 shows the analysis of the paired-samples *t*-test of the control group's performance. The results indicated that there was a significant difference with large effect sizes at both pretest (WST versus SRT; $t = 15.72$, $p < 0.001$, $d = 3.27$) and post-test (WST versus SRT; $t = 14.57$, $p < 0.001$, $d = 3.40$).

An independent-samples *t*-test analysis was further used to examine any significant difference between the two different groups of participants (experiment and control) in the post-test time point (see Table 15). The effect size was also calculated and presented.

Table 15 Comparisons between two experimental groups in the post-test

Groups	Tests	Post-test	
		t	*d*
Experiment	WST		
Control	WST	3.23**	0.85
Experiment	SRT		
Control	SRT	7.45***	1.96

Post-test Performance

■ Experimental group　□ Controlled group

Receptive Test: Experimental group 65.65, Controlled group 51.7
Productive Test: Experimental group 33.25, Controlled group 17.05
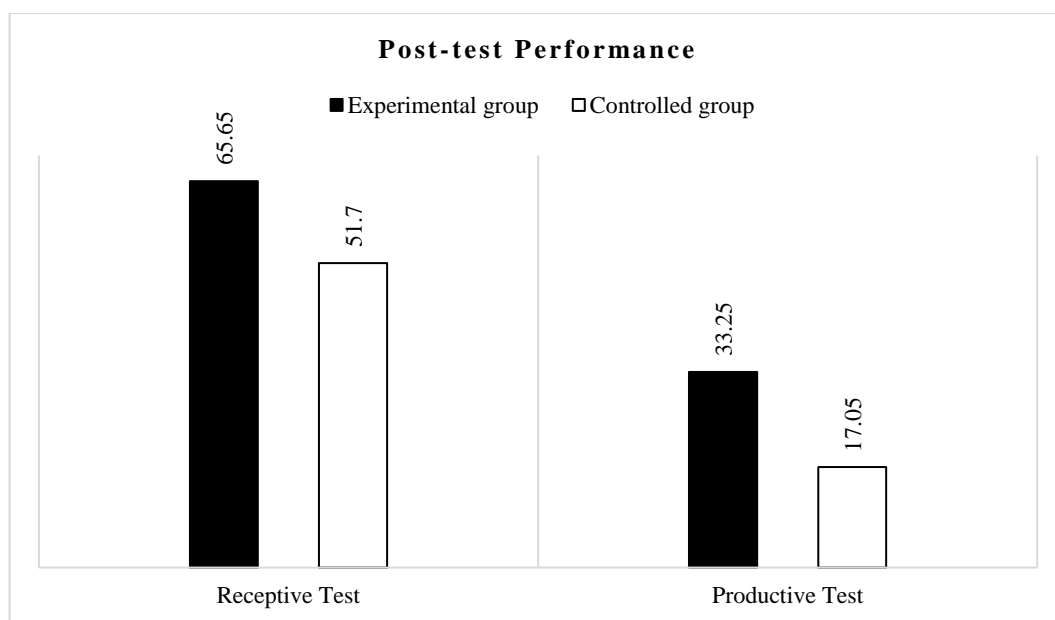
Figure 4 Post-test score between experimental and controlled groups

As illustrated in Figure 4, the analysis of the results showed that there were statistically significant differences and large effect sizes on the reception test (WST) between experimental and controlled groups in the post-test ($t = 3.23$, $p > 0.01$, $d = 0.85$) and also on the production test (SRT) in the post-test ($t = 7.45$, $p > 0.05$, $d = 1.96$).

Overall Test Performance

------◆------ Experimental group　——■—— Controlled group

Pretest　　Post-test
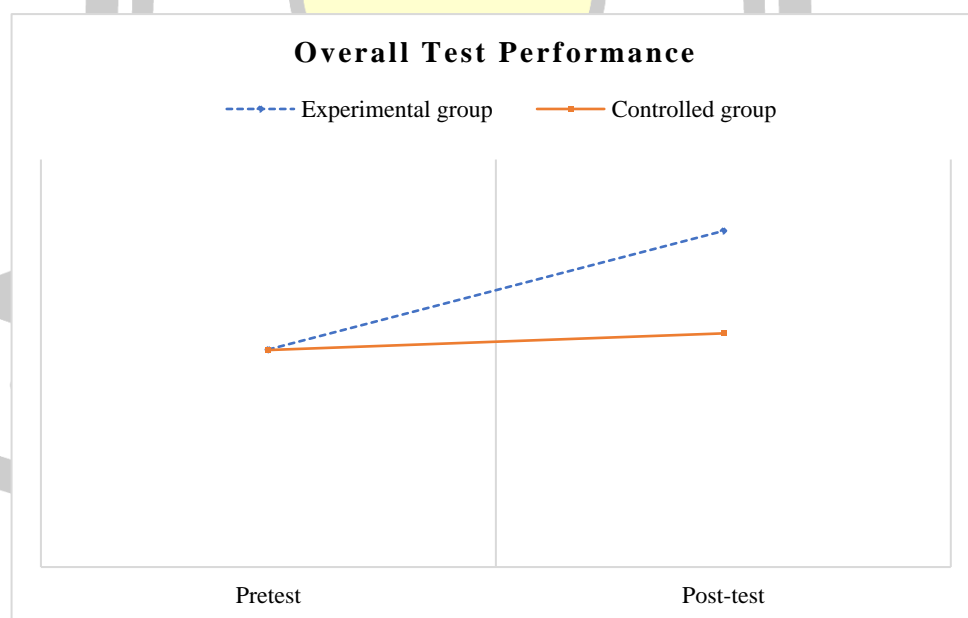
Figure 5 Comparison between experimental and controlled groups with the combined receptive and productive knowledge of derivational suffix

As shown in Figure 5, the comparison between experimental and controlled groups from the combined receptive and productive tests of derivational suffix knowledge was significantly different, revealing a medium effect size ($t = 3.81$, $p < 0.001$, $d = 0.71$). More specifically, the experiment-group participants scored better on derivational suffix knowledge at about 49.48% ($M = 9.90$, $SD = 4.46$) than the control-group participants' scores of approximately 34.39% ($M = 6.88$, $SD = 4.03$). It was apparent that after the treatment, the participants of the experimental group had a higher score in derivational suffix knowledge than the participants of the control group, about 15.09%.

4.2 Participants' perceptions of instructional treatment

This section presents the results in response to Thai high school learners' perceptions of learning vocabulary through derivational suffixes. The quantitative data were collected from the questionnaire, and the mean, the standard deviation and the percentage were calculated to present the findings.

The questionnaire analysis showed that Thai high school participants had an average of 4.22, or 84.48% (SD = 0.72), indicating a high level of agreement that the derivational suffix instruction was beneficial for vocabulary learning. More precisely, the participants (92.41%) concurred with the benefits of derivational suffix instruction; that is, derivational suffixes facilitated learning morphologically complex words and enhanced a deeper understanding of the word. Besides, participants (88.27%) stated that derivational suffix instruction is a valuable approach to learning and teaching vocabulary. In addition, word families are a useful tool for learning new words. Other relevant are presented in Table 16.

Table 16 Students' perceptions of the derivational suffix instruction

No.	Items	Mean	SD	%	Meaning
1	Derivational suffixes help develop word knowledge	4.62	0.68	92.41	very high
2	Derivational suffix instruction is a useful approach to vocabulary learning	4.41	0.73	88.27	high
3	The notion of word families promotes vocabulary learning	4.38	0.73	87.58	high
4	Word family construct is beneficial for English language learning and teaching	4.31	0.60	86.20	high
5	Derivational suffixes foster a reading ability	4.28	0.84	85.51	high

6	My vocabulary is improved through derivational suffixes instruction	4.24	0.69	84.82	high
7	Derivational suffixes knowledge enhances my English language ability (e.g., grammar, meaning, and use of a word)	4.21	0.77	84.13	high
8	Knowledge of derivational suffixes enhances English grammar	4.17	0.85	83.44	high
9	Derivational suffixes knowledge enhances writing skill	4.17	0.89	83.44	high
10	Word families help me see the relationship of form-meaning of a word	4.14	0.74	82.75	high
11	Word families enhance my knowledge of grammar	3.90	0.72	77.93	high
12	The notion of word families is not helpful to me	1.14	0.35	22.75	low
	Total	4.22	0.72	84.48	high

According to the analysis of the quantitative data obtained from the questionnaire, the results showed that more than four-fifths concurred that derivational suffix instruction is helpful for learning vocabulary and morphologically complex words in English. In brief, the current study suggests that derivational suffixes are an essential element for complex words.

4.3 Chapter summary

This chapter has presented the findings of the study. Overall, the results show that derivational suffix instruction positively affects vocabulary learning and development in Thai high school learners. The questionnaire analysis also reveals that Thai high school participants have favourable perceptions about learning vocabulary through derivational suffix instruction. The next chapter will discuss the findings with a theoretical framework of word knowledge receptively and productively. The chapter will also discuss the results of previous studies, follow by the conclusion, implications, limitations and suggestions for further studies.

CHAPTER V
CONCLUSION AND DISCUSSION

This study revealed the effect of derivational suffixes on English vocabulary knowledge in Thai high school learners. The preceding chapter proposed to describe the conclusions and answer an overall description of research questions that assume play a significant role in the effect of derivational suffix instruction on English vocabulary in Thai high school learners and Thai high school learners' perceptions of derivational suffix instruction. The chapter begins with the effects of derivational suffix instruction (see 5.1). This follows learners' perception of derivational suffix instruction (see 5.2), the conclusion (see 5.3), and implications from the study (see 5.4). The chapter ends with its limitations and recommendations for future studies (see 5.5).

5.1 The effect of derivational suffix instruction on English vocabulary knowledge in Thai high school learners

The current study examined the effect of derivational suffix instruction on English vocabulary knowledge in Thai high school learners. It also sought to explore the learners' perceptions of learning vocabulary through derivational suffix teaching. The VLT was administered to measure the vocabulary size of experimental and control groups. By contrast, the WST and the SRT were used to measure participants' knowledge of derivational suffixes. Descriptive and inferential statistics were conducted to analyze the data. The results showed that the posttest scores significantly performed better than the pretest ones in both groups. The analysis of the findings also revealed that experimental participants significantly outperformed their control counterparts. These results suggest the efficacy of derivational suffix instruction on English vocabulary learning among grade eight of Thai EFL high school learners.

In line with previous studies (Bubchaiya & Sukying, 2022; Matwangsaeng & Sukying, 2023; Sukying, 2020), the increased knowledge of derivational suffixes could be attributed to the emphasis on explicit instruction of derivatives in an EFL classroom. Nation (2013) argued that explicit teaching contributed to vocabulary learning. He further explained that the gain in vocabulary knowledge was the result of learning a word through cognitive processes: noticing, retrieval and creative use. More

specifically, the focus on derivational suffixes entailed directing the learners' attention to a particular vocabulary component and labelling it as an unknown item, leading to noticing it and recognizing its salient features (e.g. orthographic and grammatical properties). In addition, when the learners recognize it, they attempt to decontextualize it, which is essential for a better understanding of the word. This process may unfold when the teacher elaborates on a specific vocabulary item while explaining its meaning during teaching or when the teacher attempts to explain vocabulary items by translation, using synonyms, or providing their definition in L2.

As noticing concerns directing their attention to learning a word by providing the suffix meaning and some examples, retrieval enabled learners to retain and remember its meaning when the worksheets asked them to match, fill, and choose the correct words, as well as answer some questions from the teacher randomly. Nation (2013) pointed out that frequent retrieval of a word during explicit teaching allowed the learners to store it more deeply in their memory. In this regard, repetition and retrieval of the word enabled learners to recognize its meaning while being taught and seeing or using it repeatedly enhanced learners with a deeper comprehension of its meaning. Webb (2007) also pointed out that repetitions contributed to developing aspects of word knowledge. Furthermore, Brown et al. (2008) also suggested that learning a word increased due to frequent meetings. Regarding creative use, the learners were encouraged to re-conceptualize their knowledge of the word learning. For example, when having met the word '*book*' as a noun in '*Students brought a book yesterday*' and encountering the sentence '*Students booked tickets for a football match*' (Evan & Dooley, 2019), learners may have questioned the meaning and usage of the word '*book*' in this case. In this study, the students were asked to work in groups to find the words in the book then analyze their functions. Such a phenomenon would enable learners to remember such a word in their minds. Creative use is thus not limited to the addition of word meaning. Indeed, it could explain various changes from infected and derived forms through grammatical features and meaning, according to Nation (2013). Together, intentional vocabulary teaching improves learners' vocabulary learning. This situation arises due to focused repetition or memorization strategies, which learners can perform in a short period. Undoubtedly, teaching vocabulary deliberately through

derivational suffixes is effective and enables learners, at least the study participants, to sustain words in their memory.

Another explanation for the increased vocabulary knowledge could be the explicit instruction of derivational suffixes. That is, deliberate teaching in English derivational suffixes facilitates learners noticing how words are formulated and can be deconstructed into smaller constituents, as illustrated in the WST (e.g. beautifully = beauty + *-ful* + *-ly*). Expressed another way, when learners realize that words are morphologically complex elements that can be separated into affixes or lexical items, it becomes easier for them to segment or reconstruct them. This process is distinct to and more crucial than just memorizing the meaning of the words since when learners know how to form and parse affixed words, and they can invent new forms of the word using derivatives. This aligns with Sukying's (2020) results.

The efficacy of derivational suffix instruction could also be expounded by the concept of Bauer and Nation's (1993) word family *per se*. A new form of derivational suffixes conveys linguistic properties, as shown in the SRT, which measures the derivational suffix recall (She is a *beautiful* girl (beauty)). Therefore, it can confuse learners who meet it for the first time. For instance, final can change into *final*, *finally*, *finalist*, or *finalize*. Another example is the derivational suffix *-er*. It is added most commonly to verbs (e.g., play-player, smoke-smoker, use-user) but productively to other grammatical categories, where it means 'a person or thing related to it.' However, the derivational suffix -ness is usually attached to adjectives, meaning 'state or quality of it,' according to Bauer and Nation (1993).

Another example is the suffix *-ation*, which is typically added to a verb (e.g., create-creation). Such examples may become problematic to EFL learners since the meaning of the combination of the headword, and its new derived form is ambiguous (e.g., hopefulness, hopelessness). Therefore, explicit instruction of English derivational suffixes is essential for learning vocabulary among EFL learners. This finding is consistent with previous studies (Bubchaiya & Sukying, 2022; Sukying, 2020; Ward & Chuengjundaeng, 2009), indicating the benefits of affix instruction.

5.2 Participants' perception of the derivational suffix instruction in learning vocabulary

The study also explored the learners' perceptions of derivational suffix instruction in learning new words in a Thai high school. The five-point Likert scale questionnaire was administered to survey the participants' perceptions about their learning vocabulary through derivational suffix instruction. The analysis of the questionnaire data showed a high level of agreement, indicating that high school students viewed derivational suffix instruction as helpful for learning morphologically complex words.

In line with previous studies (e.g., Bubchaiya & Sukying, 2022; Cook, 2016; Sukying, 2020), derivational affixes are essential for vocabulary learning and development. The positive perception of derivational suffix instruction could be because derivational suffixes are crucial word elements. The high satisfaction of learning vocabulary through word family units, particularly derivational suffixes, could also be due to activities and tasks. With the concept of word families, students are given opportunities to work collaboratively, identifying the relatedness of individual components of a word. In addition, students are offered activities to parse or deconstruct a morphologically complex word. Moreover, students learn how to identify grammatical categories of the word. These activities promote a more pleasant and engaging learning environment, increasing their understanding of the nature of morphologically complex words in English, especially recognizing and recalling orthographic and syntactic properties. Such activities also reinforce the student's motivation to learn new vocabulary.

These findings are consistent with previous studies (Bubchaiya & Sukying, 2022; Nation, 2013; Sukying, 2020) that word families are perceived as a facilitative strategy for learning and teaching vocabulary. Overall, the current study provides information to support the importance of word families, especially derivational suffixes, in the EFL context. Classroom activities or tasks also play a crucial role in learning and developing vocabulary knowledge.

5.3 Conclusion

The current findings provided evidence to support the importance of derivational suffix knowledge in vocabulary acquisition and development. Indeed, the study highlighted the significant effect of derivational suffix instruction on learning new vocabulary among EFL learners. Moreover, the concept of word family should be focused on when teaching and learning vocabulary. The study also showed that learners had positive perceptions of learning vocabulary through deliberate teaching of derivational suffixes. In conclusion, instruction of derivational suffixes in English enhances and mediates learners acquiring vocabulary in both linguistic and semantic properties of the word. As such, derivatives are essential for learning and teaching new words.

5.4 Implications from the study

This study yielded some fruitful information for pedagogical and theoretical implications. From a pedagogical standpoint, the current study implies that adding explicit derivational instruction to EFL classroom practices is worthwhile. The efficacy of deliberate teaching of derivational suffixes has already been demonstrated, and thus this type of pedagogy should be added to English language classrooms. In addition, derivational suffix knowledge should be considered a facilitative tool for EFL learners since high school learners in the study can increase their metalinguistic strategies by thinking about the language and reflecting on their vocabulary learning process. Overall, the current study provides evidence to support the significant effect of English derivational suffix instruction on vocabulary learning. The study also highlights the significance of teaching English derivational suffixes and applying affixes' meaning and/or usage to the headword. Specifically, affix knowledge has the potential to be applied not only by language teachers to guide deliberate vocabulary learning and teaching in classes but also as an essential vehicle for independent learning for language learners. Also, the participants' vocabulary knowledge was gained from learning a word through cognitive processes: noticing, retrieval and creative use. This concept could be applied in the language classroom to deliberately help students learn the language.

From a theoretical perspective, the current study suggests that different aspects of derivational suffixes are acquired and mastered at different speeds, as measured by the WST and the SRT. Accordingly, the study points out that multiple formats of

knowledge assessment are necessary to obtain a clearer insight into the extent of learners' affix knowledge and its roles in vocabulary learning and development. Longitudinal studies would be particularly cost-effective in this regard. In particular, research would benefit from emphasizing the effect of different knowledge aspects of English prefixes and suffixes in different contexts and levels of English language abilities. Further studies on English affix learning and teaching would establish significant pedagogical and theoretical pathways for vocabulary acquisition and development.

5.5 Limitations and recommendations for future studies

The present study had some limitations of this knowledge. First, the study participants were limited to one homogenous group of students in Thailand, where students' proficiency levels were similar. Therefore, the current findings might not be generalizable to other contexts to some extent. In addition, the participants were selected using convenience sampling because the researcher was a school teacher. Indeed, the participants were not randomly assigned to groups. Finally, learning activities or tasks are, to some extent, restricted due to the Covid-19 pandemic situation. In addition, the measures of derivational suffixes were explicitly developed for this research purpose.

The current study suggests the sufficiency of L2 learners in wording structure and English skills due to the different abilities of learners, some of whom might expand their vocabulary knowledge and others of whom may have limited English vocabulary knowledge. For example, using the SRT improved grammatical functions with learners who had English problems. SRT would be helpful by changing forms of derivational suffixes in various tasks that identify nouns, verbs, adjectives, and adverbs, particularly in writing contexts. However, the most effective teaching method may depend on each learner's unique requirements and learning style.

The study has also shown the importance of affixes, particularly derivational suffixes. Accordingly, multiple assessment forms may be needed to better understand affix knowledge. Longitudinal studies would be helpful. Indeed, additional longitudinal research with different cohorts would benefit from emphasizing incremental development of affix knowledge aspects in different contexts and language abilities.

Further studies on affix acquisition would establish pedagogical and theoretical pathways for vocabulary learning and development.
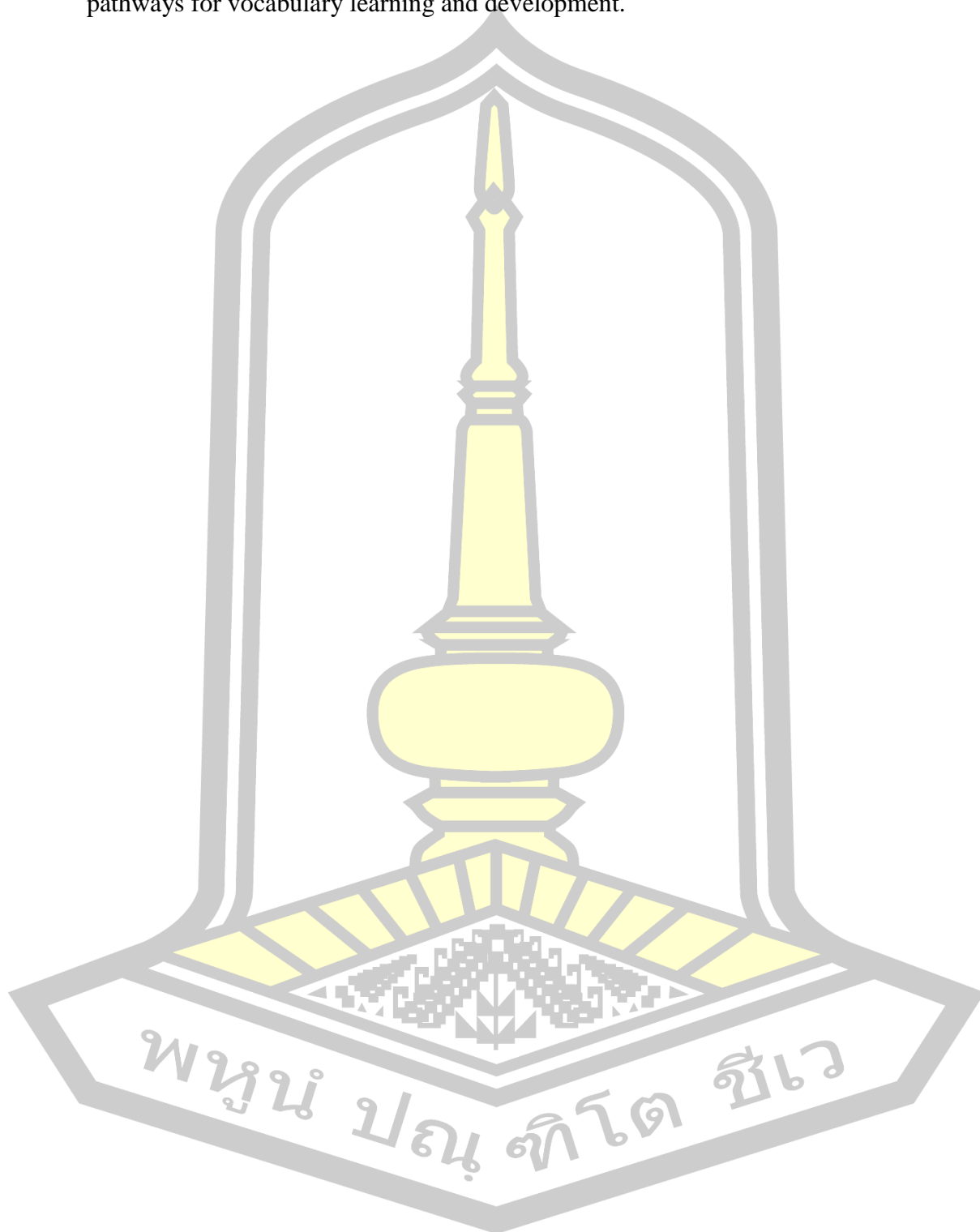
REFERENCES

References

Adam, V. (2014). *Complex worlds in English*. New York: Routledge Taylor and Francis Group.

Aitchison, J. (1987). *Words in the mind: An introduction to the mental lexicon.* Oxford: Basil Blackwell.

Anderson, R. C., & Freebody, P. (1981). Vocabulary knowledge. In J. Guthrie (Ed.), *Comprehension and teaching: Research reviews* (pp. 77-117). Newark, DE: International Reading Association.

Apel, K., Petscher, Y., & Henbest, V. S. (2021, February 3). Morphological Awareness Test for Reading and Spelling (MATRS): Technical Report. https://doi.org/10.31234/osf.io/ty2pe

Alharbi, H. (2021). EFL learners' perceptions of vocabulary learning strategies: A mixed-methods study. *Journal of Language Teaching and Research*, *12*(2), 243-258.

Bauer, L., & Nation, I.S.P. (1993). Word families. *International Journal of Lexicography*, *6*(4), 253-279.

Beglar, D., & Hunt, A. (1999). Revising and validating the 2000 Word Level and University Word Level vocabulary tests. *Language Testing*, *16*(2), 131-162. https://doi: 10.1177/026553229901600202

Brown, R., Waring, R., & Donkaewbua, S. (2008). Incidental vocabulary acquisition from reading, reading-while-listening, and listening to stories.

Browne, C., Culligan, B., & Phillips, J. (2013). The new general service list: A core vocabulary for EFL students and teachers. *JALTs The Language Teacher*, *34*(7), 13-15.

Bubchaiya, N. & Sukying, A. (2022). The effect of word part strategy instruction on the vocabulary knowledge of Thai primary school learners. *Journal of Education and Learning*, *11*(5), p. 70-81 https://doi.org/10.5539/jel.v11n5p70

Carlisle, J. F. (2000). Awareness of the structure and meaning of morphologically complex words: Impact on reading. *Reading and Writing*, *12*(3), 169-190.

Cronbach, C. L. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*, 297-334.

Claravall, E. (2016). Integrating morphological knowledge in reading intervention: Framework and principles to guide special education teachers. *Teaching Exceptional Children*, *48*(4), 195-203.

Coady, J. (1997). L2 vocabulary acquisition. *Second Language Vocabulary Acquisition*, 273-290.

Cook, M. J. (2016). How does learning about affixes (prefixes and suffixes) help English Language Learners (ELLS) understand the meaning and use of affixes?. [Master Degree Dissertations, Hamline University].

Milton J. (2009). *Measuring second language vocabulary acquisition*. Cambridge: Multilingual Matters.

Daulton, F. E. (1998). Japanese loanword cognates and the acquisition of English vocabulary. *The Language Teacher*, *20*(1), 17-25.

Ellis, R. (2001). Introduction: Investigating form-focused instruction. *Language Learning*, *51*, 1-46.

Elgort, I. (2011). Deliberate learning and vocabulary acquisition in a second language. *Language Learning*, *61*(2), 367-413.

Evan, V. & Dooley, J. (2019). ASSESS 2 (พิมพ์ครั้งที่ 5). กรุงเทพมหานคร: สำนักพิมพ์อักษรเจริญ.

Field, A. (2009) Discovering Statistics Using SPSS (3rd Ed.). Sage Publications Ltd., London.

Finegan, E. (2012). *Language: Its structure and use* (6th ed.). Wadsworth Cengage Learning.

Fromkin, V., Rodman R., & Hyams, N. (2014). *An introduction to language* (10th ed.). Wadsworth Cengage Learning.

González-Fernández, B., & Schmitt, N. (2019). Word knowledge: Exploring the relationships and order of acquisition of vocabulary knowledge components. *Applied Linguistics, 41*(4), 481-505. https://doi.org/10.1093/applin/amy057

Hayashi, Y., & Murphy, V. (2011). An investigation of morphological awareness in Japanese learners. *Language Learning*, *39*(1), 105-120.

Hajiyeva, K. (2014). Receptive and productive vocabulary level needs: An empirical study of Azerbaijani English majors. *International Journal of Learning, Teaching and Educational Research, 9*(1), 51-65.

Henriksen, B. (1999). Three dimensions of vocabulary development. *Studies in Second Language Acquisition, 21*(2), 303-317.

Hulstijn, J. (2003). L2 Incidental and intentional learning. *The Handbook of Second Language Acquisition, 19*, 349-381.

Jeensuk, S., & Sukying, A. (2021). An investigation of high school EFL learners' knowledge of English collocations. *Journal of Applied Linguistics and Language Research*, *8*(1), 90-106.

Jeensuk, S., & Sukying, A. (2021). Receptive and productive knowledge of English collocations among Thai EFL high school learners. *Journal of Humanities & Social Sciences (JHUSOC)*, *19*(1), 159-180.

Kader, A.S., & Kader, D.A. (2018). *Vocabulary size and collocational knowledge of Saudi EFL university learners.* Faculty of Education, Menoufia University.

Kamarudin, R., Majid, F. A., Zamin, A. A. M., & Daud, N. S. M. (2019). L2 learners' receptive and productive knowledge of phrasal verbs. *International Journal of Education and Literacy Studies,* 7(4), 144-149.

Kim, C. (2013). Vocabulary acquisition with affixation: Learning English words based on prefixes and suffixes. *International Journal of Second Language Studies*, *31*(2), 43-80.

Laufer, B. (1992). How much lexis is necessary for reading comprehension? In P. J. L. Arnaud, & H. Bejoing (Eds.), *Vocabulary and applied linguistics* (pp. 129-132). London: Macmillan.

Laufer, B. (1997). The Lexical plight in second language reading. In J. Coady, & T. Huckin (Eds.), *Second language vocabulary acquisition* (pp. 20-34). Cambridge: Cambridge University Press.

Laufer, B. (1998). The development of passive and active vocabulary: Same or different? *Applied Linguistics, 19*(2), 255-271.

Laufer, B. (2000). *Task effect on instructed vocabulary learning*: *The hypothesis of 'involvement'.* Paper presented at the selected papers from AILA '99 Tokyo, Tokyo.

Laufer, B. (2014). Vocabulary in a second language: Selection, acquisition, and testing: A commentary on four studies for JALT vocabulary SIG. *Vocabulary Learning and Instruction*, *3*(2), 38-46.

Li, M., & Kirby, J. R. (2014). Unexpected poor comprehenders among adolescent ESL students. *Scientific Studies of Reading*, *18*(2), 75-93.

Laufer, B. (2017). From word parts to full texts: Searching for effective methods of vocabulary learning. *Language Teaching Research, 21*(1), 5-11.

Laufer, B., & Hulstijn, J. (2001). Incidental vocabulary acquisition in a second language: The construct of task-induced involvement. *Applied Linguistics*, *22*(1), 1-26.

Laufer, B., & Goldstein, Z. (2004). Testing vocabulary knowledge: Size, strength, and computer adaptiveness. *Language Learning, 54*(3), 399-436.

Laufer, B., & Ravenhorst-Kalovski, G. C. (2010). Lexical threshold revisited: Lexical text coverage, learners' vocabulary size and reading comprehension. *Reading in a Foreign Language, 22*(1), 15-30.

Laufer, B. & Nation, I.S.P. (2012). Vocabulary. In S. Gass, & A. Mackey (Eds.), *The Routledge Handbook of Second Language Acquisition* (pp. 163-176). New York: Routledge.

Lieber, R. (2010). *Introducing morphology*. Cambridge University Press.

Laufer, B., & Ravenhorst-Kalovski, G. C. (2010). Lexical threshold revisited: Lexical text coverage, learners' vocabulary size and reading comprehension. *Reading in a Foreign Language, 22*(1), 15-30.

Lewis, M. (1993). *The lexical approach*. Hove: Language Teaching Publications.

Lieber, R. (2016). *On the interplay of facts and theory: Revisiting synthetic compounds in English*. John Benjamins.

Magnussen, E. S., & Sukying, A. (2021). The impact of songs and TPR on Thai preschoolers' vocabulary acquisition. *THAITESOL Journal*, *34*(1), 71-92.

Matwangsaeng, R., & Sukying, A. (2023). The Effects of Morphological Awareness on L2 Vocabulary Knowledge of Thai EFL Young Learners. *World Journal of English Language*, *13*(2), 51-63.

McBride-Chang, C., Cho, J. R., Liu, H., Wagner, R. K., Shu, H., Zhou, A., & Muse, A. (2005). Changing models across cultures: Associations of phonological awareness and morphological structure awareness with vocabulary and word recognition in second graders from Beijing, Hong Kong, Korea, and the United States. *Journal of Experimental Child Psychology*, *92*(2), 140-160.

Mochizuki, M., & Aizawa, K. (2000). An affix acquisition order for EFL learners: An exploratory study. *System*, *28*(2), 291-304.

Nation, I. S. P. (1983). Testing and teaching vocabulary. *Guidelines*, 5, 12-25.

Nation, I. S. P. (1990). *Teaching and learning vocabulary*. Heinle and Heinle.

Nation, I. S. P. (1998). Helping learners take control of their vocabulary learning. *GRETA, 6*(1), 9-18.

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

Nation, I. S. P. (2006). How large a vocabulary is needed for reading and listening?. *Canadian Modern Language Review*, *63*(1), 59-82.

Nation, I. S. P. (2012) Teaching language in use: Vocabulary. In M. Eisenmann, & T. Summer (Eds.) *Basic issues in EFL teaching and learning* (pp. 103-116). University Winter Verlag.

Nation, I. S. P. (2013). *Learning vocabulary in another language* (2nd ed.). Cambridge University Press.

Nation, I. S. P. (2016). *Making and using word lists for language learning and testing*. Amsterdam: John Benjamins Publishing Company.

Nation, I. S. P., & Meara, P. (2010). Vocabulary. In N. Schmitt (Ed.), *An introduction to applied linguistics* (pp. 44-45). London: Hodder Education.

Nation, I. S. P., & Webb, S. (2011). *Content-based instruction and vocabulary learning*. Handbook of Research in Second Language Teaching and Learning. https://doi.org/10.4324/9780203836507.ch38

Nisa, B. (2020). A Morphological process of derivational affixes in popular Line Webtoon: The Annarasumanara. *Journal of Research and Innovation in Language*, *2*(2), 85-92.

Nirattisai, S., & Chiramanee, T. (2014). Vocabulary learning strategies of Thai university students and its relationship to vocabulary size. *International Journal of English Language Education*, *2*(1), 273-287.

Nontasee, W., & Sukying, A. (2020). The acquisition of vocabulary knowledge in Thai EFL high school students. Journal of Humanities and Social Sciences, 6(1), 63-87.

Nontasee, W., & Sukying, A. (2021). The learnability of word knowledge aspects in Thai EFL high school learners. *Journal of Language and Linguistic Studies*, *17*(1), 34-55. https://doi.org/10.5430/wjel.v12n5p306

Nunnally, J. C., & Bernstein, I. H. (1994). The assessment of reliability. *Psychometric Theory*, 3, 248-292.

Nurweni, A., & Read, J. (1999). The English vocabulary knowledge of Indonesian university students. *English for Specific Purposes*, *18*(2), 161-175.

Ozturk, M. (2015). Vocabulary growth of the advanced EFL learner. *The Language Learning Journal*, *43*(1), 94-109.

Plag, I. (2002). *The role of selectional restrictions, phonotactics and parsing in constraining suffix ordering in English.* Yearbook of Morphology 2001, Springer, Dordrecht.

Phakiti, A. (2014). Experimental research methods in language learning. *London: Bloomsbury Academic*.

Phakiti, A. (2015). Quantitative research and analysis. *Research Methods in Applied Linguistics*: *A Practical Resource*, 27-48.

Promluan, Y., & Sukying, A. (2021). The impact of extensive reading on Thai primary school children's vocabulary knowledge. *Journal of Modern Learning Development, 6*(5), 209-223.

Read, J. (1993). The development of a new measure of L2 vocabulary knowledge. *Language Testing*, *10*(3), 355-371.

Read, J. (2000). *Assessing vocabulary*. Cambridge University Press.

Read, J. (2004). Researching in teaching vocabulary. *Annual Review of Applied Linguistics, 24*, 146-161.

Richards, J. C. (1976). The role of vocabulary testing. *TESOL Quarterly, 10*(1), 77-89.

Rai sa-nguan, P. S., & Sukying, A. (2021). Narrow reading and EFL learners' vocabulary learning in a Thai Buddhist university. *Journal of Buddhist Education and Research, 7*(1), 1-15.

Sasao, Y. & Webb, S. (2017). The Word Part Levels Test. *Language Teaching Research. 21*(1), 12-30.

Schmidt, R. (2010). *Attention, awareness, and individual differences in language learning*. Singapore: National University of Singapore.

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

Schmitt, N. (2008). Review article: Instructed second language vocabulary learning. *Language Teaching Research, 12*(3), 329-363.

Schmitt, N. (2010). *Researching vocabulary*: *A vocabulary research manual*. Basingstoke: Palgrave Macmillan.

Schmitt, N. (2014). Size and depth of vocabulary knowledge: What the research shows. *Language Learning, 64*(4), 913-951.

Schmitt, N., & Meara, P. (1997). Researching vocabulary through a word knowledge framework: Word associations and verbal suffixes. *Studies in Second Language Acquisition, 19*(1), 17-36.

Schmitt, N., Schmitt, D., & Clapham, C. (2001). Developing and exploring the behavior of two new versions of the Vocabulary Levels Test. *Language Testing, 18*, 55-88.

Schmitt, N., & Zimmerman, C. B. (2002). Derivative word forms: What do learners know?. *TESOL Quarterly*, *36*(2), 145-171.

Schmitt, N., Jiang, X., and Grabe, W. (2011). The percentage of words known in a text and reading comprehension. *Modern Language Journal*, *95*(1), 26-43.

Sritulanon, A. (2013). The effects of morphological instruction on reading abilities of low proficiency adult EFL learners at a university in Thailand. *Learn Journal: Language Education and Acquisition Research Network*, *6*(1), 49-65.

Sukying, A. (2017). The relationship between receptive and productive affix knowledge and vocabulary size in an EFL Context. [Doctoral dissertation, University of Sydney]. https://ses.library.usyd.edu.au/handle/2123/17630

Sukying, A. (2018a). Investigating receptive and productive affix knowledge in EFL learners. In D. Hirsh (Ed.), *Explorations in second language vocabulary research* (pp. 183-218). Peter Lang.

Sukying, A. (2018b). The acquisition of English affix knowledge in L2 learners. NIDA Journal of Language and Communication, 23(34), 89-102.

Sukying, A. (2020). Word knowledge through morphological awareness in EFL learners. *TESOL International Journal, 15*(1), 74-85.

Sukying, A. (2022). A taxonomy of English affix acquisition in EFL learners. In D. Hirsh (Ed.). *Research perspectives in language and education* (pp. 49-82). Peter Lang.

Sukying, A., & Matwangsaeng, R. (2022). Exploring primary school students' morphological awareness in Thailand. *World Journal of English Language, 12*(6), 388-401.

Sukying, A., & Nontasee, W. (2022). The acquisition order of vocabulary knowledge aspects in Thai EFL learners. *World Journal of English Language*, *12*(5).

Tabrizi, A. R. N., & Feiz, F. S. (2016). The effect of deliberate versus incidental vocabulary learning strategy on Iranian high school students' vocabulary learning. *World Wide Journal of Multidisciplinary Research and Development*, *2*(3), 1-8.

Thangaroonsin, H. (2016). *Investigation of receptive vocabulary size of Thai EFL graduate students*. Thammasat University.

Thiendathong, P., & **Sukying, A.** (2021). Vocabulary learning strategies used by Thai high school students in science, language, and English programs. *Arab World English Journal (AWEJ)*, *12*(2), 306 -317. https://dx.doi.org/10.24093/awej/vol12no2.21

Van Hees, J., & Nation, P. (2017). *What every primary school teacher should know about vocabulary*. NZCER Press.

Ward, J., & Chuenjundaeng, J. (2009). Suffix knowledge: Acquisition and applications. *System*, *37*(3), 461-469.

Wan-a-rom, U. (2012). The effects of control for ability level on EFL reading of graded readers. *English Language Teaching*, *5*(1), 49-60.

Webb, S. (2005). Receptive and productive vocabulary learning: The effects of reading and writing on word knowledge. *Studies in Second Language Acquisition*, *27*(1), 33-52.

Webb, S. (2007). The effects of repetition on vocabulary knowledge. *Applied linguistics*, *28*(1), 46-65.

Web, S. & Nation, P. (2017). *How vocabulary is learned. Oxford*: Oxford University Press.

Wero, Y., Machmud, K., & Husain, N. (2021). The study on students' vocabulary size. *Jambura Journal of English Teaching and Literature, 2*(1), 22-34. https://doi.org/10.37905/jetl.v2i1.10279

Vadasy, P. F., & Nelson, J. R. (2012). *Vocabulary Instruction for struggling students*. London: Guilford.

Vidal, K. (2011). A comparison of the effects of reading and listening on incidental vocabulary acquisition. *Language Learning*, *61*(1), 219-258.

Yowaboot, C. (2022). *Using digital flashcards to enhance Thai EFL primary school students' vocabulary knowledge* (Doctoral dissertation, Mahasarakham University).

Yowaboot, C. & **Sukying, A**. (2022, online first). Using digital flashcards to enhance Thai EFL primary school students' vocabulary knowledge. *English Language Teaching 15*(7), pp. 61-74 https://doi.org/10.5539/elt.v15n7p61

Yunus, K., & Mohammad, A. B. (2016). The breadth of receptive vocabulary knowledge among English major university student. *Journal of Nusansara Studies*, *1*(1), 7-17.

Yu, F., & Sukying, A. (2021). English Vocabulary Learning by Smartphones of Chinese EFL Learners in Thailand. *Journal of Modern Learning Development*, *6*(1), 149-163.

Zhang, X. L., & Sukying, A. (2021). Receptive and productive knowledge of lexical collocations in Thai university learners of English. *European Journal of English Language Teaching, 6*(6), 266-285.

Zhong, H. F. (2014). The interface between receptive and productive vocabulary knowledge: Vocabulary knowledge as a multi-aspect construct. [Doctoral dissertation, University of Sydney].

Zhong, H. F. (2018). The relationship between receptive and productive vocabulary knowledge: A perspective from vocabulary use in sentence writing. *The Language Learning Journal, 46*(4), 357-370.

APPENDICES
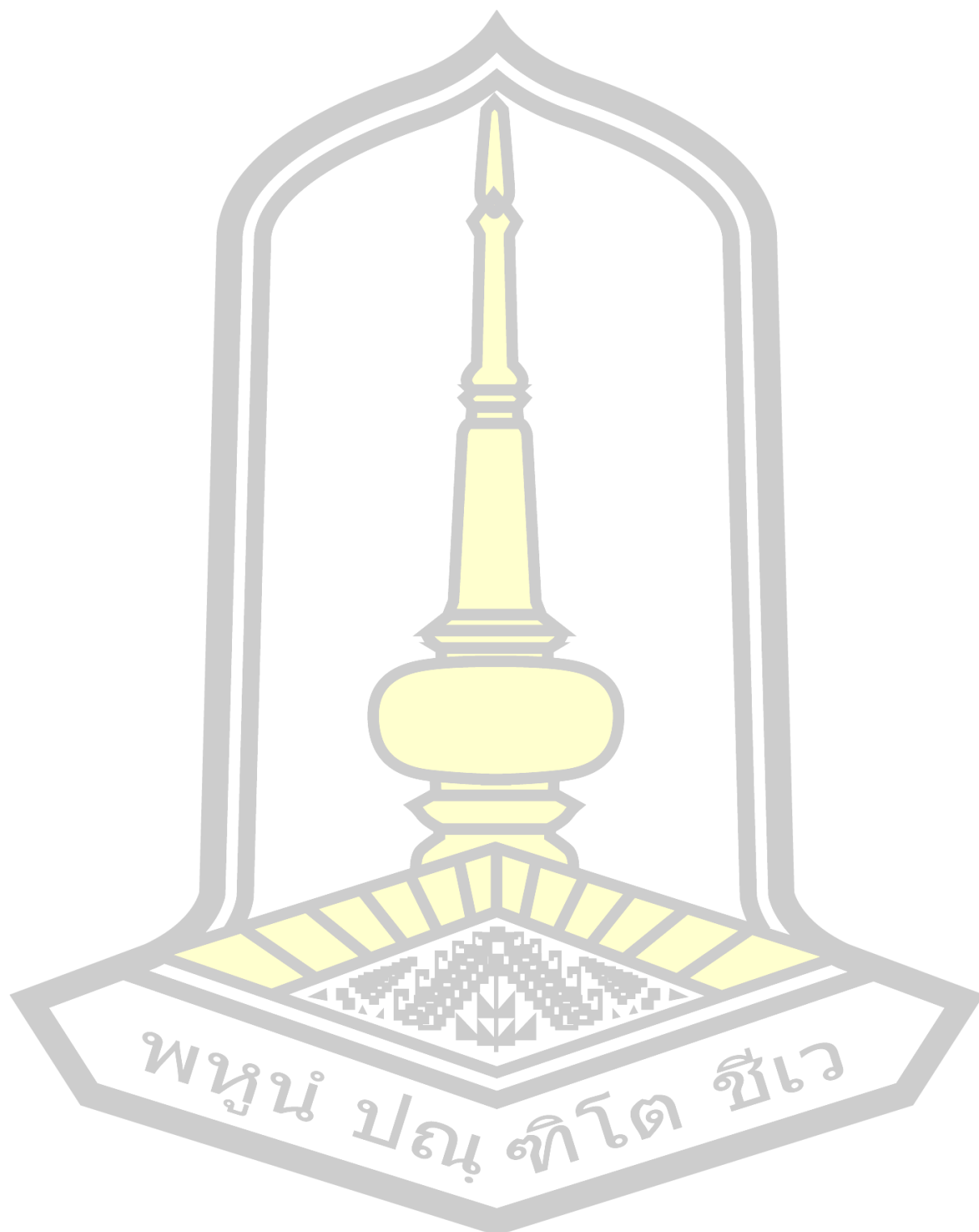
Appendix I-A: Vocabulary Levels Test

This is a vocabulary test. You must choose the right word to go with each meaning. Write the number of that word next to its meaning. Here is an example.

1. business
2. clock   _____ part of a house
3. horse   _____ animal with four legs
4. pencil   _____ something used for writing
5. shoe
6. wall

You answer it in the following way.

1. business
2. clock   ____6___ part of a house
3. horse   ____3___ animal with four legs
4. pencil   ____4___ something used for writing
5. shoe
6. wall

2000 level

1. copy
2. event   _____ end or highest point
3. motor   _____ this moves a car
4. pity   _____ thing made to be like another
5. profit
6. tip

1. coffee
2. disease   _____ money for work
3. justice   _____ a piece of clothing
4. skirt   _____ using the law in the right way
5. stage
6. wage

1. dozen
2. empire   _____ chance
3. gift   _____ twelve
4. opportunity _____ money paid to the government
5. relief
6. tax

1. arrange
2. develop   _____ grow
3. lean   _____ put in order
4. owe   _____ like more than something else
5. prefer
6. seize

1. ancient
2. curious   _____ not easy
3. difficult   _____ very old
4. entire   _____ related to God
5. holy
6. social

1. accident
2. debt   _____ loud deep sound
3. fortune   _____ something you must pay
4. pride   _____ having a high opinion of yourself
5. roar
6. thread

1. clerk
2. frame   _____ a drink
3. noise   _____ office worker
4. respect   _____ unwanted sound
5. theatre
6. wine

1. admire
2. complain   _____ make wider or longer
3. fix   _____ bring in for the first time
4. hire   _____ have a high opinion of someone
5. introduce
6. stretch
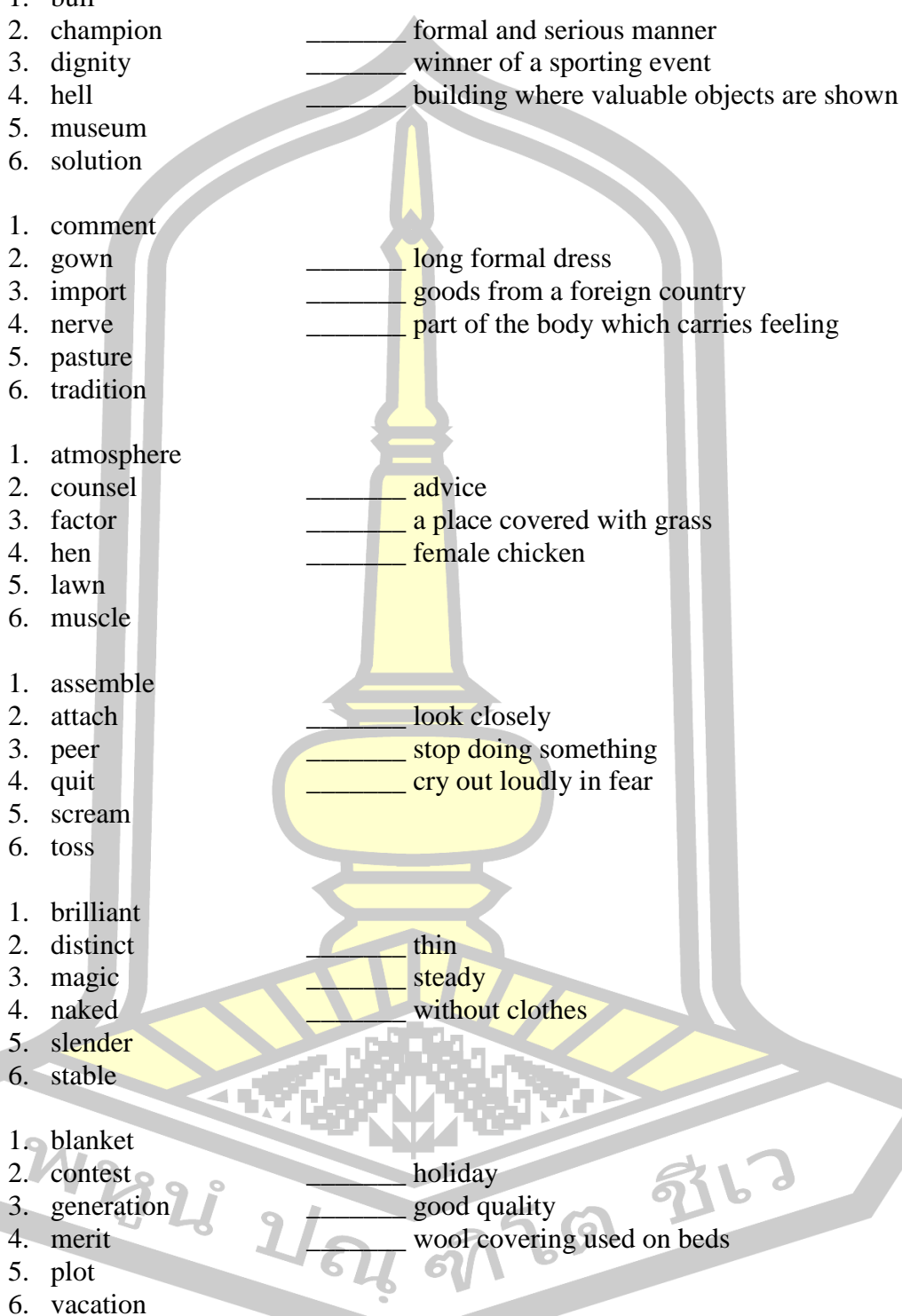
1. blame
2. elect   _____ make
3. jump   _____ choose by voting
4. manufacture _____ become like water
5. melt
6. threaten

1. bitter
2. independent _____ beautiful
3. lovely   _____ small
4. merry   _____ liked by many people
5. popular
6. slight
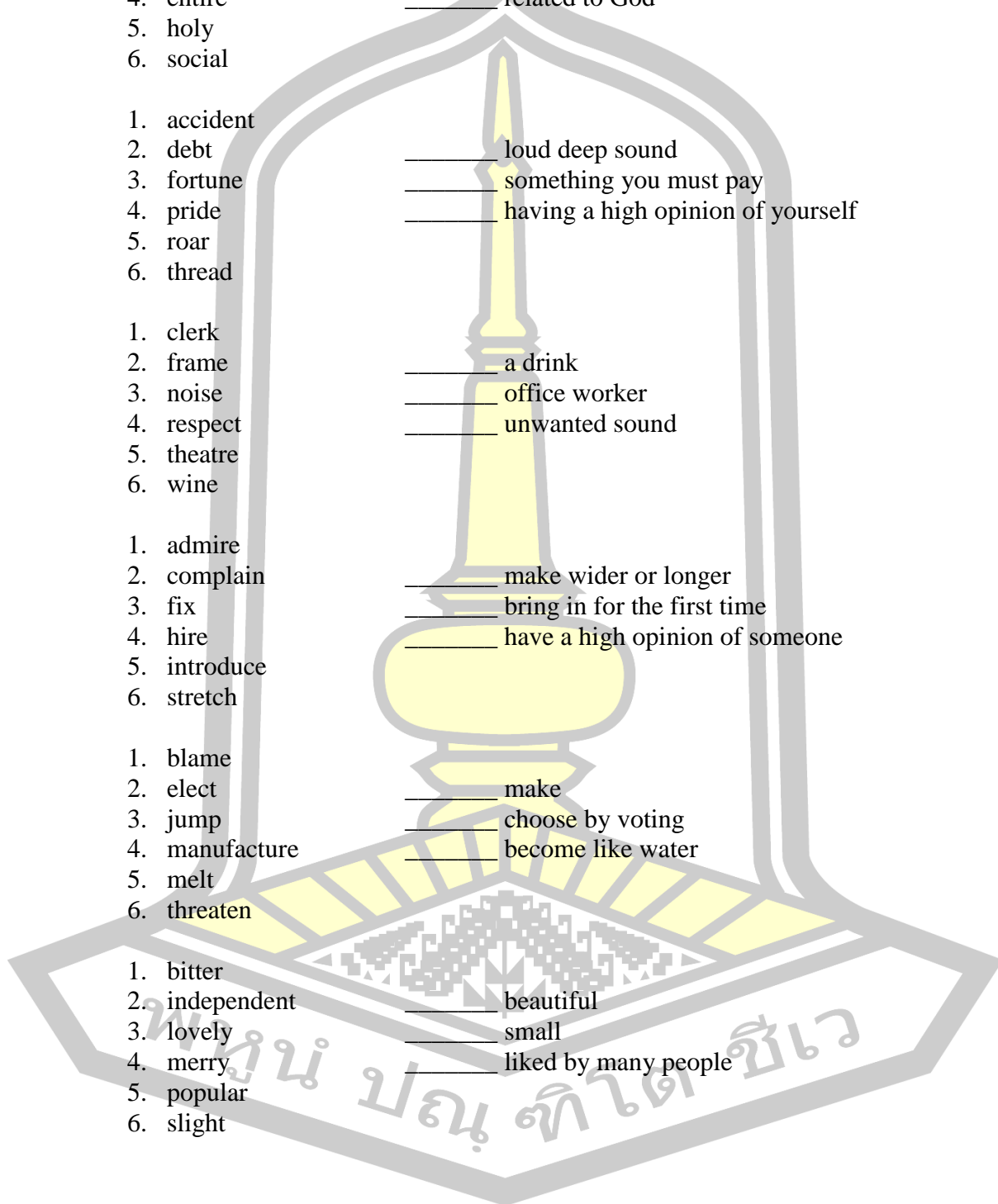
3000 Level

1. bull
2. champion   _____ formal and serious manner
3. dignity   _____ winner of a sporting event
4. hell   _____ building where valuable objects are shown
5. museum
6. solution

1. comment
2. gown   _____ long formal dress
3. import   _____ goods from a foreign country
4. nerve   _____ part of the body which carries feeling
5. pasture
6. tradition

1. atmosphere
2. counsel   _____ advice
3. factor   _____ a place covered with grass
4. hen   _____ female chicken
5. lawn
6. muscle

1. assemble
2. attach   _____ look closely
3. peer   _____ stop doing something
4. quit   _____ cry out loudly in fear
5. scream
6. toss

1. brilliant
2. distinct   _____ thin
3. magic   _____ steady
4. naked   _____ without clothes
5. slender
6. stable

1. blanket
2. contest   _____ holiday
3. generation   _____ good quality
4. merit   _____ wool covering used on beds
5. plot
6. vacation

1. administration
2. angel   _____ group of animals
3. frost   _____ spirit who servers God
4. herd   _____ managing business and affairs
5. fort
6. pond

1. abandon
2. dwell   _____ live in a place
3. oblige   _____ follow in order to catch
4. pursue   _____ permanently
5. quote
6. resolve

1. drift
2. endure   _____ suffer patiently
3. grasp   _____ join wool threads together
4. knit   _____ hold firmly with your hands
5. register
6. tumble

1. aware
2. blank   _____ usual
3. desperate   _____ best or most important
4. normal   _____ knowing what is happening
5. striking
6. supreme
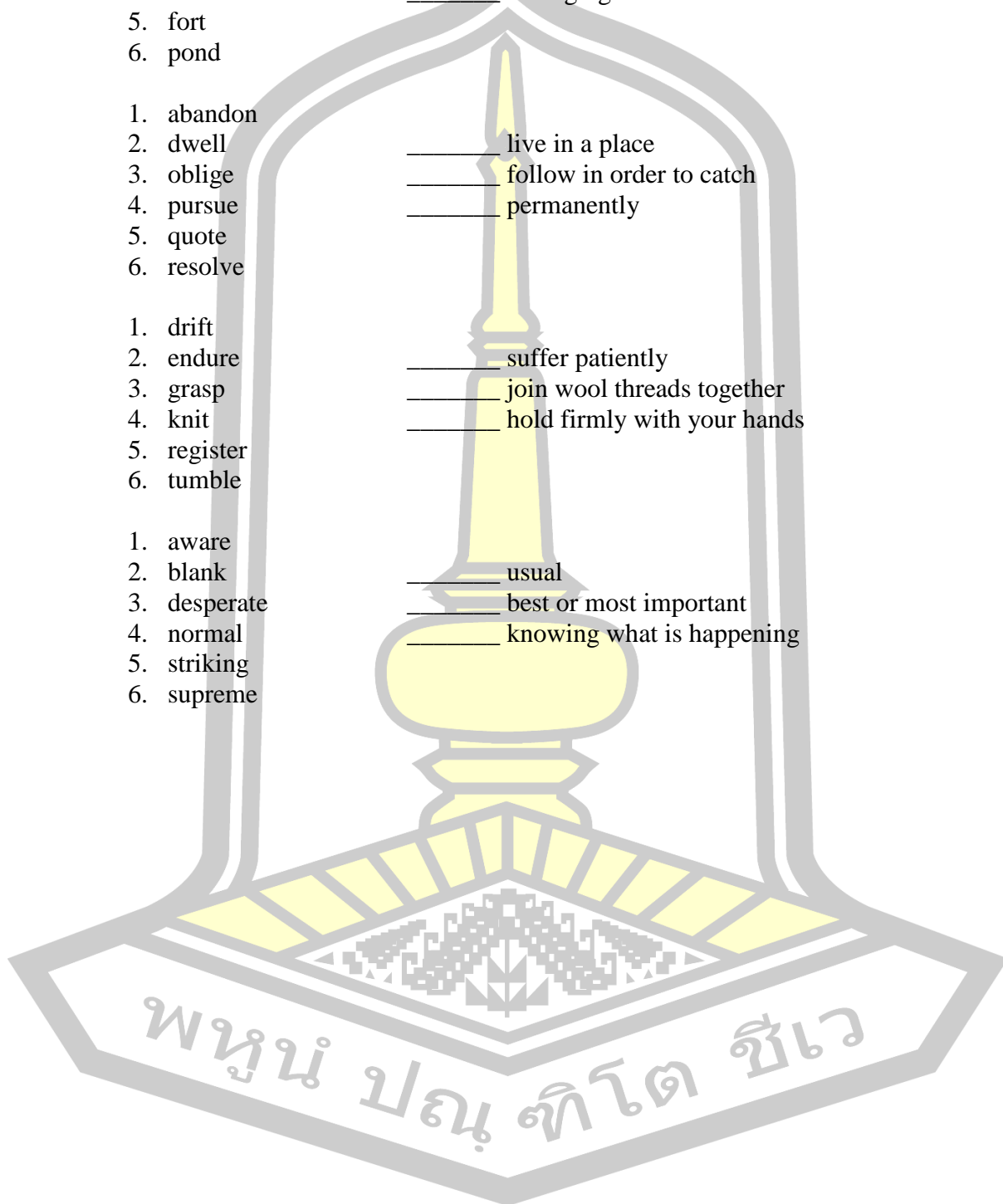
Appendix I-B: The Word Segmentation Task
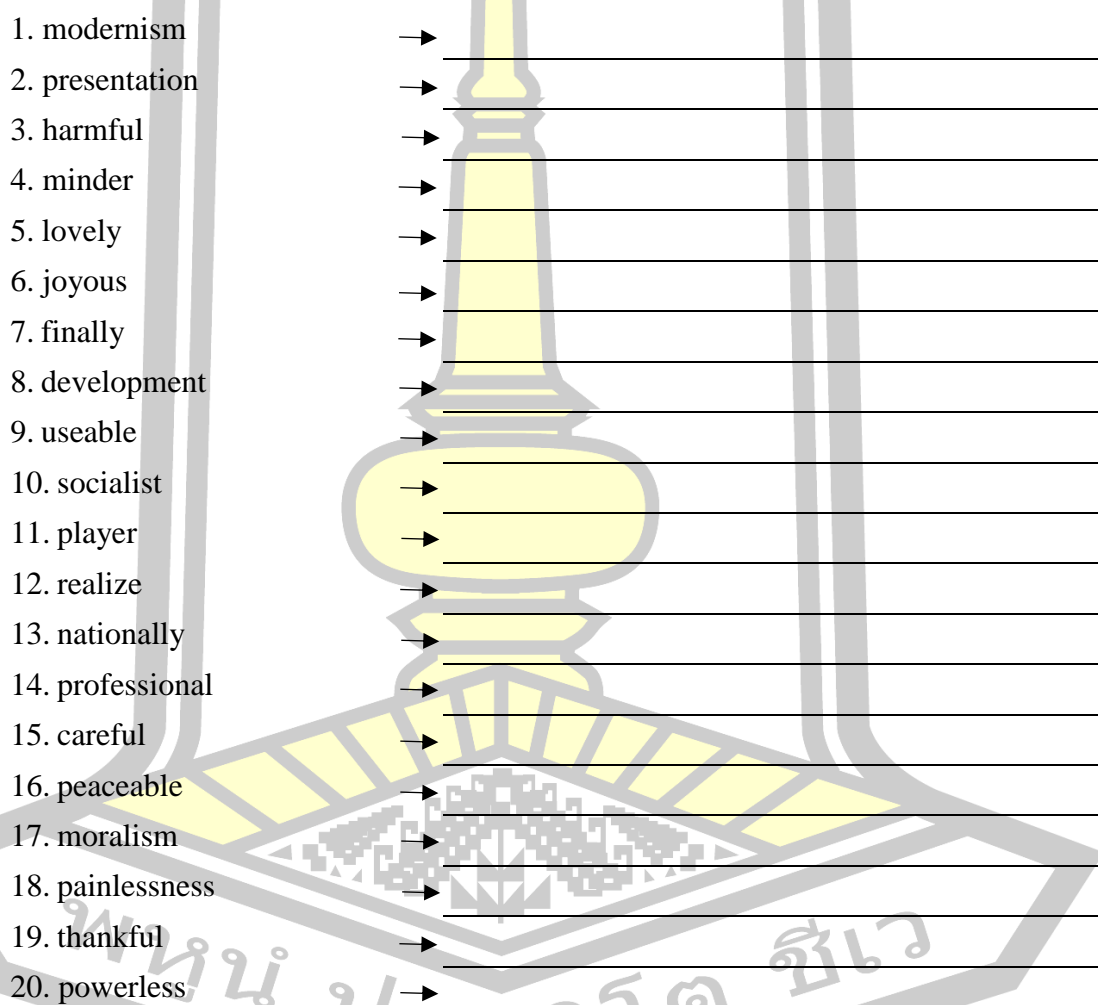
Introductions: Break down a word into the smallest parts. (คำชี้แจง ให้นักเรียนแยก
ส่วนประกอบของคำที่กำหนดให้)

E.g.,　adventurous　→　adventur + ous

　　　　brightness　→　bright + ness

　　　　moveable　→　move + able

　　　　plantation　→　plant + ation

1. modernism　→ _____

2. presentation　→ _____

3. harmful　→ _____

4. minder　→ _____

5. lovely　→ _____

6. joyous　→ _____

7. finally　→ _____

8. development　→ _____

9. useable　→ _____

10. socialist　→ _____

11. player　→ _____

12. realize　→ _____

13. nationally　→ _____

14. professional　→ _____

15. careful　→ _____

16. peaceable　→ _____

17. moralism　→ _____

18. painlessness　→ _____

19. thankful　→ _____

20. powerless　→ _____

Appendix I-C: The Derivational Suffix Task

Instructions: Write a correct form of a word in the blanket for each blank in the sentence and choose an appropriate classification for the word you provided. (คำชี้แจง นำคำศัพท์ที่กำหนดให้ในวงเล็บเติมลงในช่องว่างให้ถูกต้อง พร้อมระบุชนิดของคำ)

E.g.
A: the necklace is …**beautiful**... (beauty), the bead reminds me of ancient China.

Missing derivational suffix			
N	V	Adj.	Adv.
		×	

B: This was not the film in which everyone lived .…**happily**… (happy) ever after.

Missing derivational suffix			
N	V	Adj.	Adv.
			×

Context	Classification			
	N.	**V.**	**Adj.**	**Adv.**
1. Some teenagers …………………..… disregard the basic rules for wearing contact lenses. (care)				
2. We will …………………..…. our decision for the summer trip this afternoon. (final)				
3. Doctors have warned against the ……………………… effect on the environment. (harm)				
4. My right wrist is so ……………………... at times I nearly faint. (pain)				
5. He is a …………………….. and very playful puppy. (love)				
6. The school director will raise the money to ……………………. classrooms. (modern)				
7. Jones advised us to slowly and ………………….. add cooked food and grains back into our diet. (mind)				

Context	Classification			
	N.	V.	Adj.	Adv.
8. Others …………………. (moral) the faithful in light of her virtuous life. (moral)				
9. She has a British …………………... (nation)				
10. Sunday was so …………………. in our home. (peace)				
11. I do not say he is not a good ………………...., just not great. (play)				
12. She's singing ………………… anthems for a new generation. (power)				
13. He shows us an impressive PowerPoint ……………..... (present)				
14. I am a ……………… photographer. (profession)				
15. We try to help all students …………………. their full potential desire. (real)				
16. They are trying to build.…………….…… in their own country. (social)				
17. There were no …………………. prints on the teapot or bowl. (use)				
18. I feel a sense of …….………….., a peace that I knew him. (thank)				
19. It is necessary for computer software ………………… . (develop)				
20. A …………………. crowd eagerly awaiting the countdown to midnight on New Year's Eve. (joy)				

Appendix III: Ethics Approval

บันทึกข้อความ

ส่วนราชการ กองส่งเสริมการวิจัยและบริการวิชาการ มหาวิทยาลัยมหาสารคาม **โทร** 1758

ที่ อว 0605.1(9)/44   **วันที่** 5 มกราคม 2566

เรื่อง ขอส่งหนังสือรับรองจริยธรรมการวิจัยในคน

เรียน คณบดีคณะมนุษยศาสตร์และสังคมศาสตร์

　　　　ตามที่นิสิตในสังกัดของท่านได้ยื่นโครงการวิจัยเพื่อขอรับการพิจารณาจริยธรรมการวิจัยในคน
จำนวน 1 เรื่อง ดังนี้

　　1.　ผลของการสร้างคำที่เกี่ยวข้องกันต่อความรู้เรื่องคำศัพท์ภาษาอังกฤษของนักเรียนชั้น
　　　　มัธยมศึกษาไทย : The Effects of Derivational Suffixes on English Vocabulary
　　　　Knowledge in Thai High School Learners. (No.426/65)

　　　　บัดนี้ ที่ประชุมคณะกรรมการจริยธรรมการวิจัยในคน มหาวิทยาลัยมหาสารคาม ครั้งที่ 12/2565
ได้พิจารณาโครงการวิจัยข้างต้นบนพื้นฐานด้านจริยธรรมการวิจัยในคนแล้ว เมื่อวันที่ 28 ธันวาคม 2565
พร้อมทั้งมีมติอนุมัติรับรองโครงการวิจัยแบบเร่งรัด (Expedited Review) ตามเอกสารใบรับรองจริยธรรม
การวิจัยในคนที่ส่งมาพร้อมกันนี้ ทั้งนี้หากมีการเปลี่ยนแปลงใดๆ ในโครงการวิจัย ผู้วิจัยจักต้องยื่นขอรับการ
พิจารณาใหม่

　　　　จึงเรียนมาเพื่อโปรดทราบและดำเนินการต่อไป

(นางฉวีวรรณ อรรคะเศรษฐัง)
เลขานุการคณะกรรมการจริยธรรมการวิจัยในคน
มหาวิทยาลัยมหาสารคาม

คณะกรรมการจริยธรรมการวิจัยในคน มหาวิทยาลัยมหาสารคาม

เอกสารรับรองโครงการวิจัย

เลขที่การรับรอง : 415-426/2565

ชื่อโครงการวิจัย (ภาษาไทย) ผลของการสร้างคำที่เกี่ยวข้องกันต่อความรู้เรื่องคำศัพท์ภาษาอังกฤษของนักเรียน
ชั้นมัธยมศึกษาไทย

ชื่อโครงการวิจัย (ภาษาอังกฤษ) The Effects of Derivational Suffixes on English Vocabulary Knowledge
in Thai High School Learners.

ผู้วิจัย : นางสาวภัทธิรา สุมาลี

หน่วยงานที่รับผิดชอบ : คณะมนุษยศาสตร์และสังคมศาสตร์

สถานที่ทำการวิจัย : จังหวัดสุรินทร์

ประเภทการพิจารณาแบบ : แบบเร่งรัด

วันที่รับรอง : 28 ธันวาคม 2565   วันหมดอายุ : 27 ธันวาคม 2566

      ข้อเสนอการวิจัยนี้ ได้รับการพิจารณาและให้ความเห็นชอบจากคณะกรรมการจริยธรรมการวิจัยในคน
มหาวิทยาลัยมหาสารคามแล้ว และอนุมัติในด้านจริยธรรมให้ดำเนินการศึกษาวิจัยเรื่องข้างต้นได้ บนพื้นฐานของ
โครงร่างงานวิจัยที่คณะกรรมการฯ ได้รับและพิจารณา เมื่อเสร็จสิ้นโครงการแล้วให้ผู้วิจัยส่งแบบฟอร์มการปิด
โครงการและรายงานผลการดำเนินงานมายังคณะกรรมการจริยธรรมการวิจัยในคน มหาวิทยาลัยมหาสารคาม หรือ
หากมีการเปลี่ยนแปลงใดๆ ในโครงการวิจัย ผู้วิจัยจักต้องยื่นขอรับการพิจารณาใหม่

(ผู้ช่วยศาสตราจารย์ เภสัชกรหญิงราตรี สว่างจิตร)
ประธานคณะกรรมการจริยธรรมการวิจัยในคน
มหาวิทยาลัยมหาสารคาม

ทั้งนี้ การรับรองนี้มีเงื่อนไขดังที่ระบุไว้ด้านหลังทุกข้อ (ดูด้านหลังของเอกสารรับรองโครงการวิจัย)

MAHASARAKHAM UNIVERSITY ETHICS COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS

Certificate of Approval

Approval number: 415-426/2022

Title : The Effects of Derivational Suffixes on English Vocabulary Knowledge in Thai High School Learners.

Principal Investigator : Miss. Pattira Sumalee

Responsible Department : Faculty of Education

Research site : Surin Province

Review Method : Expedited Review

Date of Manufacture : 28 December 2022   **expire :** 27 December 2023

This research application has been reviewed and approved by the Ethics Committee for Research Involving Human Subjects, Mahasarakham University, Thailand. Approval is dependent on local ethical approval having been received. Any subsequent changes to the consent form must be re-submitted to the Committee.

Ratree S.

(Asst. Prof. Ratree Sawangjit)

Chairman

Approval is granted subject to the following conditions: (see back of this Certificate)

426/65

เอกสารชี้แจงสำหรับผู้ปกครองอาสาสมัครที่ตอบแบบสอบถาม (เด็กอายุ 7-18 ปี)

(สำหรับการตอบแบบสอบถามอายุต่ำกว่า 18 ปี)

เรียน   ผู้ปกครองของผู้ตอบแบบสอบถามทุกท่าน

เนื่องด้วยข้าพเจ้า นางสาวภัทธิรา สุมาลี นิสิตปริญญาโท สาขาวิชาการสอนภาษาอังกฤษ คณะมนุษยศาสตร์และสังคมศาสตร์ มหาวิทยาลัยมหาสารคาม กำลังดำเนินการวิจัย เรื่อง ผลของการสร้างคำที่เกี่ยวข้องกันต่อความรู้เรื่องคำศัพท์ภาษาอังกฤษของนักเรียนชั้นมัธยมศึกษาไทย (The Effects of Derivational Suffixes on English Vocabulary Knowledge in Thai High School Learners) โดยมีวัตถุประสงค์ของการวิจัย เพื่อศึกษาเรื่องผลของการเรียนรู้คำศัพท์ผ่านการสอนโดยใช้โสตทัศนูปกรณ์ในผู้เรียนภาษาอังกฤษในฐานะภาษาต่างประเทศของนักเรียนระดับชั้นประถมศึกษา

ท่านอาจจะไม่ได้รับประโยชน์โดยตรงจากการเข้าร่วมโครงการวิจัยนี้ แต่ข้อมูลที่ได้จะมีประโยชน์ต่อทางวิชาการ หากท่านตัดสินใจให้เด็กในปกครองของท่านเข้าร่วมการวิจัยแล้ว ผู้วิจัยจะขอให้เด็กในปกครองของท่านทำแบบทดทอบวัดความรู้เกี่ยวกับวงคำศัพท์ ความรู้คำศัพท์ภาษาอังกฤษทั้งด้านการรับสารและการส่งสาร จำนวน 2 ชุด โดยข้อสอบทั้ง 2 ชุด จะใช้เวลาชุดละ 60 นาที ในวันเวลาที่ต่างกัน และจะขอรับแบบทดสอบวัดความรู้โดยผู้วิจัยจะไปเก็บด้วยตนเอง

หากเด็กในปกครองของท่านรู้สึกอึดอัด หรือรู้สึกไม่สบายใจกับบางคำถาม เด็กในปกครองของท่านมีสิทธิ์ที่จะไม่ตอบคำถามเหล่านั้นได้ รวมถึงเด็กในปกครองของท่านมีสิทธิ์ถอนตัวออกจากโครงการนี้เมื่อใดก็ได้ โดยไม่ต้องแจ้งให้ทราบล่วงหน้า และการไม่เข้าร่วมวิจัยหรือถอนตัวออกจากโครงการวิจัยนี้ จะไม่มีผลกระทบต่อผลการเรียนของเด็กในปกครองของท่าน

ข้อมูลในการตอบแบบสอบถามของเด็กในปกครองของท่านจะถูกเก็บรักษาไว้ ไม่เปิดเผยต่อสาธารณะเป็นรายบุคคล แต่จะรายงานผลการวิจัยในภาพรวมเท่านั้น และจะดำเนินการทำลายข้อมูลที่เกี่ยวข้องภายหลังเสร็จสิ้นการวิจัย

การวิจัยครั้งนี้เด็กในปกครองท่านจะไม่ได้รับค่าตอบแทนและไม่เสียค่าใช้จ่ายใด ๆ ทั้งสิ้น

หากท่านและเด็กในปกครองของท่านมีข้อสงสัยเกี่ยวกับงานวิจัย โปรดติดต่อได้ที่

นางสาวภัทธิรา สุมาลี คณะมนุษศาสตร์และสังคมศาสตร์ มหาวิทยาลัยมหาสารคาม เบอร์โทรศัพท์ 082-864-8861 และหากท่านและเด็กในปกครองของท่านได้รับการปฏิบัติไม่ตรงตามที่ระบุไว้หรือต้องการทราบสิทธิของท่านและเด็กในปกครองของท่านขณะเข้าร่วมการวิจัยนี้ สามารถติดต่อได้ที่ "คณะกรรมการจริยธรรมการวิจัยในคนมหาวิทยาลัยมหาสารคาม กองส่งเสริมการวิจัยและบริการวิชาการ มหาวิทยาลัยมหาสารคาม" โทร. 043-754416 เบอร์ภายใน 1755

ขอขอบพระคุณอย่างสูง

....

(นางสาวภัทธิรา สุมาลี)

ผู้วิจัย

The Research Instruments

Student instruction sheet for the Levels Test

This is a vocabulary test. You must choose the right word to go with each meaning. Write the number of that word next to its meaning. Here is an example.

1 business
2 clock   _____ part of a house
3 horse   _____ animal with four legs
4 pencil   _____ something used for writing
5 shoe
6 wall

You answer it in the following way.

1 business
2 clock   __6__ part of a house
3 horse   __3__ animal with four legs
4 pencil   __4__ something used for writing
5 shoe
6 wall

Some words are in the test to make it more difficult. You do not have to find a meaning for these words. In the example above, these words are *business*, *clock* and *shoe*.

   If you have no idea about the meaning of a word, do not guess. But if you think you might know the meaning, then you should try to find the answer.

Appendix 2   The Vocabulary Levels Test: Version 2
(© Norbert Schmitt)

The 2000 word level

1 copy   _____ end or highest   1 accident   _____ loud deep
2 event   point   2 debt   sound
3 motor   _____ this moves a   3 fortune   _____ something you
4 pity   car   4 pride   must pay
5 profit   _____ thing made to   5 roar   _____ having a high
6 tip   be like   6 thread   opinion of
                  another   yourself

1	coffee	_____ money for work	1	arrange	_____ grow
2	disease		2	develop	_____ put in order
3	justice	_____ a piece of clothing	3	lean	_____ like more than something
4	skirt		4	owe	else
5	stage	_____ using the law in the right way	5	prefer	
6	wage		6	seize	

1	clerk	_____ a drink	1	blame	_____ make
2	frame	_____ office worker	2	elect	_____ choose by voting
3	noise	_____ unwanted sound	3	jump	
4	respect		4	threaten	_____ become like water
5	theater		5	melt	
6	wine		6	manufacture	

1	dozen	_____ chance	1	ancient	_____ not easy
2	empire	_____ twelve	2	curious	_____ very old
3	gift	_____ money paid to the government	3	difficult	_____ related to God
4	tax		4	entire	
5	relief		5	holy	
6	opportunity		5	social	

1	admire	_____ make wider or longer	1	slight	_____ beautiful
2	complain		2	bitter	_____ small
3	fix	_____ bring in for the first time	3	lovely	_____ liked by many people
4	hire		4	merry	
5	introduce	_____ have a high opinion of someone	5	popular	
6	stretch		6	independent	

The 3000 word level

1	bull	_____ formal and serious manner	1	muscle	_____ advice
2	champion		2	counsel	_____ a place covered with grass
3	dignity	_____ winner of a sporting event	3	factor	
4	hell		4	hen	_____ female chicken
5	museum	_____ building where valuable objects are shown	5	lawn	
6	solution		6	atmosphere	
			5	lawn	
			6	atmosphere	

1 blanket _____ holiday
2 contest _____ good quality
3 generation _____ wool covering
4 merit used on
5 plot beds
6 vacation

1 abandon _____ live in a place
2 dwell _____ follow in
3 oblige order to catch
4 pursue _____ leave
5 quote _____ something
6 resolve permanently

1 comment _____ long formal
2 gown dress
3 import _____ goods from a
4 nerve foreign
5 pasture country
6 tradition _____ part of the
body which
carries feeling

1 assemble _____ look closely
2 attach _____ stop doing
3 peer something
4 quit _____ cry out loudly
5 scream in fear
6 toss

1 pond _____ group of
2 angel animals
3 frost _____ spirit who
4 herd serves God
5 fort _____ managing
6 administration business and
affairs

1 drift _____ suffer
2 endure patiently
3 grasp _____ join wool
4 knit threads
5 register together
6 tumble _____ hold firmly
with your
hands

1 brilliant _____ thin
2 distinct _____ steady
3 magic _____ without
4 naked clothes
5 slender
6 stable

1 aware _____ usual
2 blank _____ best or most
3 desperate important
4 normal _____ knowing what
5 striking is happening
6 supreme

Academic Vocabulary

1 area _____ written
2 contract agreement
3 definition _____ way of doing
4 evidence something
5 method _____ reason for
6 role believing
something is
or is not true

1 adult _____ end
2 vehicle _____ machine used
3 exploitation to move
4 infrastructure people or
5 termination goods
6 schedule _____ list of things
to do at
certain times

1	debate	_____ plan
2	exposure	_____ choice
3	integration	_____ joining
4	option	something
5	scheme	into a
6	stability	whole

1	alter	_____ change
2	coincide	_____ say something
3	deny	is not true
4	devote	_____ describe
5	release	clearly and
6	specify	exactly

1	access	_____ male or
2	gender	female
3	psychology	_____ study of the
4	license	mind
5	orientation	_____ entrance or
6	implementation	way in

1	correspond	_____ keep
2	diminish	_____ match or be
3	emerge	in agreement
4	highlight	with
5	invoke	_____ give special
6	retain	attention
		to something

1	edition	_____ collecting
2	accumulation	things over
3	guarantee	time
4	media	_____ promise to
5	motivation	repair a
6	phenomenon	broken
		product
		_____ feeling a
		strong reason
		or
		need to do
		something

1	bond	_____ make smaller
2	channel	_____ guess the
3	estimate	number or
4	identify	size of
5	mediate	something
6	minimize	_____ recognizing
		and naming
		a person or
		thing

1	explicit	_____ last
2	final	_____ stiff
3	negative	_____ meaning
4	professional	'no' or 'not'
5	rigid	
6	sole	

1	abstract	_____ next to
2	adjacent	_____ added to
3	neutral	_____ concerning
4	global	the whole
5	controversial	world
6	supplementary	

The 5000 word level

1	analysis	_____ eagerness
2	curb	_____ loan to buy a
3	gravel	house
4	mortgage	_____ small
5	scar	stones
6	zeal	mixed with
		sand

1	artillery	_____ a kind of tree
2	creed	
3	hydrogen	_____ system of
4	maple	belief
5	pork	_____ large gun
6	streak	on wheels

58

Appendix B: The Word Segmentation Task

Introductions: Break down a word into the smallest parts. (คำชี้แจง ให้นักเรียนแยกส่วนประกอบ ของคำที่กำหนดให้)

E.g., adventurous → adventur + ous

brightness → bright + ness

moveable → move + able

plantation → plant + ation

1. careless → _____

2. finalize → _____

3. harmfulness → _____

4. painlessly → _____

5. lover → _____

6. materialization → _____

7. minder → _____

8. moralist → _____

9. nationalism → _____

10. peaceable → _____

11. playfulness → _____

12. powerfully → _____

13. presenter → _____

14. romantically → _____

15. realize → _____

16. sociable → _____

17. useful → _____

18. thankfully → _____

19. developmental → _____

20. joyousness → _____

Appendix C: The Derivational Suffix Task

Instructions: Write a correct form of a word in the blanket for each blank in the sentence and choose an appropriate classification for the word you provided. (คำชี้แจง นำ คำศัพท์ที่กำหนดให้ในวงเล็บเติมลงในช่องว่างให้ถูกต้อง พร้อมระบุชนิดของคำ)

E.g.   A: She is a ...*beautiful*...

Missing derivational suffix			
N	V	Adj.	Adv.
		×	

(beauty) girl.

B: She was ...***happily***... (happy) married by that time to Tom Redfern.

Missing derivational suffix			
N	V	Adj.	Adv.
			×

Context	Classification			
	N.	V.	Adj.	Adv.
1. I think some people haven't read .... (care) the job posting.				
2. Before I .... (final) the list, I want to hear from you.				
3. This was a little .... (harm) fun, no feelings involved.				
4. Peace and .... (pain): a feeling that the ties that bind one to the world have been cut.				
5. He is a .... (love) and very playful puppy.				
6. The Bible had that right. And the .... (material) scientists are deluding themselves				
7. You still have to be .... (mind) that you're on TV and you're saying things.				
8. .... (moral) is not merely a practice that results in an individual, group, or activity				

Context	Classification			
	N.	V.	Adj.	Adv.
9. The park is listed as a .... (national) Registered 3686484 Mercedes				
10. The silence and .... (peace) were gone.				
11. I'm a soccer .... (play) and not the most dainty of runners.				
12. He's so timid with such a .... (power) voice.				
13. He shows us an impressive PowerPoint .... (present).				
14. Oh, my God! That's so .... (romantic).				
15. This is a .... (real) desire.				
16. He is a .... (social) which is whatever socialist does when they get into power.				
17. People hand out their .... (use), expired shit.				
18. I am .... (thank) we have a small house.				
19. The later .... (develop) by Smith almost led to schism and later to persecution.				
20. We are happy and .... (joy) about the life they had and hope that they will continue to be happy wherever				

แบบยินยอมให้ทำการวิจัยสำหรับอาสาสมัครอายุ 7-18 ปี

ข้าพเจ้า (นาย /นาง /นางสาว)..นามสกุล............................อายุ................ปี เกี่ยวข้อง
เป็นบิดา/มารดา/ผู้ปกครองของ (ด.ญ./ด.ช./นาย/นางสาว)..............................นามสกุล............................อายุ............ปี

<u>ขอแสดงความยินยอมให้เด็กในปกครองของข้าพเจ้าเข้าร่วมการวิจัย</u> ในโครงการวิจัยเรื่อง "ผลของการสร้างคำที่เกี่ยวข้อง
กันต่อความรู้เรื่องคำศัพท์ภาษาอังกฤษของนักเรียนชั้นมัธยมศึกษาไทย (The Effects of Derivational Suffixes on English
Vocabulary Knowledge in Thai High School Learners)"

     ข้าพเจ้าและ<u>เด็ก</u>ในปกครอง/ในความดูแลของข้าพเจ้า ได้รับทราบรายละเอียดเกี่ยวกับที่มาและวัตถุประสงค์ใน
การทำวิจัย รายละเอียดขั้นตอนต่าง ๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง/อันตราย และประโยชน์ซึ่งจะ
เกิดขึ้นจากการวิจัยเรื่องนี้ ข้าพเจ้าได้อ่านรายละเอียดในแบบชี้แจงสำหรับอาสาสมัครหรือผู้มีส่วนร่วมในการวิจัยโดยตลอด
และได้รับคำอธิบายจากผู้วิจัย จนเข้าใจเป็นอย่างดีแล้ว

     ตลอดจนการรับรองจากผู้วิจัยที่จะเก็บรักษาข้อมูลของเด็กในปกครองของข้าพเจ้าไว้เป็นความลับ และจะไม่ระบุ
ชื่อหรือข้อมูลส่วนตัวเป็นรายบุคคลต่อสาธารณชน โดยผลการวิจัยจะนำเสนอในลักษณะภาพรวมที่เป็นการสรุป
ผลการวิจัยเพื่อประโยชน์ทางวิชาการเท่านั้น

     ข้าพเจ้าจึงสมัครใจให้<u>เด็ก</u>ในปกครอง/ในความดูแลของข้าพเจ้าเข้าร่วมในโครงการวิจัยนี้ ภายใต้เงื่อนไขที่ระบุไว้
ในแบบชี้แจงอาสาสมัคร โดยข้าพเจ้ายินยอมให้<u>เด็ก</u>ในปกครอง/ในความดูแลของข้าพเจ้า เข้าร่วมในการวิจัย และเด็กใน
ปกครอง/ในความดูแลของข้าพเจ้าสมัครใจเข้าร่วมการวิจัยนี้ ภายใต้เงื่อนไขที่ระบุไว้ในแบบชี้แจงอาสาสมัคร

     ข้าพเจ้ามีสิทธิให้ผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าหรือเป็นความประสงค์ของผู้ที่อยู่ในปกครอง/ใน
ความดูแล ถอนตัวออกจากการวิจัยเมื่อใดก็ได้ โดยไม่ต้องแจ้งเหตุผล ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลกระทบ
ในทางใด ๆ ต่อผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าและตัวข้าพเจ้าทั้งสิ้น

     ข้าพเจ้าได้รับคำรับรองว่า ผู้วิจัยจะปฏิบัติต่อผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้า ตามข้อมูลที่ระบุไว้
ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย และข้อมูลใดๆที่เกี่ยวข้องกับผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้า ผู้วิจัยจะ
เก็บรักษาเป็นความลับ โดยจะนำเสนอข้อมูลจากการวิจัยเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่
การระบุตัวผู้ที่อยู่ในปกครอง/ในความดูแลของข้าพเจ้าและตัวข้าพเจ้า

     หากข้าพเจ้าและผู้ที่อยู่ในความปกครองของข้าพเจ้ามีข้อข้องใจเกี่ยวกับขั้นตอนของการวิจัย ข้าพเจ้าสามารถ
ติดต่อกับ นางสาวภัทธิรา สุมาลี คณะมนุษยศาสตร์และสังคมศาสตร์ มหาวิทยาลัยมหาสารคาม เบอร์โทรศัพท์ 082-
8648861 ได้ตลอด 24 ชั่วโมง

     ข้าพเจ้าและผู้ที่อยู่ในปกครองของข้าพเจ้าเข้าใจข้อความในแบบคำชี้แจงอาสาสมัคร และแบบยินยอมนี้โดย
ตลอดแล้ว จึงลงลายมือชื่อไว้

ลงชื่อ................................อาสาสมัคร   ลงชื่อ................................ผู้ปกครอง
(................................)   (................................)
วันที่........เดือน...............พ.ศ........   วันที่........เดือน...............พ.ศ........

ลงชื่อ................................ผู้ให้ข้อมูลและขอความยินยอม
(นางสาวภัทธิรา สุมาลี)
วันที่........เดือน...............พ.ศ........

Appendix IV: Item difficulty and item discrimination
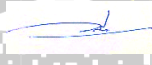
Test	item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
WST	H	14	13	16	14	13	12	14	12	16	16	15	14	16	14	14	12	15	10	13	15
	L	5	5	4	7	2	7	5	5	5	2	3	5	6	2	5	5	1	5	2	1
	p	0.633	0.6	0.667	0.7	0.5	0.633	0.633	0.567	0.7	0.6	0.6	0.633	0.733	0.533	0.633	0.567	0.533	0.5	0.5	0.533
	r	0.6	0.533	0.8	0.467	0.733	0.333	0.6	0.467	0.733	0.933	0.8	0.6	0.667	0.8	0.6	0.467	0.933	0.333	0.733	0.933
SRT	H	12	11	12	12	14	13	12	10	12	14	16	12	12	12	12	11	15	14	10	10
	L	4	2	3	2	1	2	3	2	3	4	4	1	4	2	1	4	3	2	2	2
	p	0.533	0.433	0.5	0.467	0.5	0.5	0.5	0.4	0.5	0.6	0.667	0.433	0.533	0.467	0.433	0.5	0.6	0.533	0.4	0.4
	r	0.533	0.6	0.6	0.667	0.867	0.733	0.6	0.533	0.6	0.667	0.8	0.733	0.533	0.667	0.733	0.467	0.8	0.8	0.533	0.533
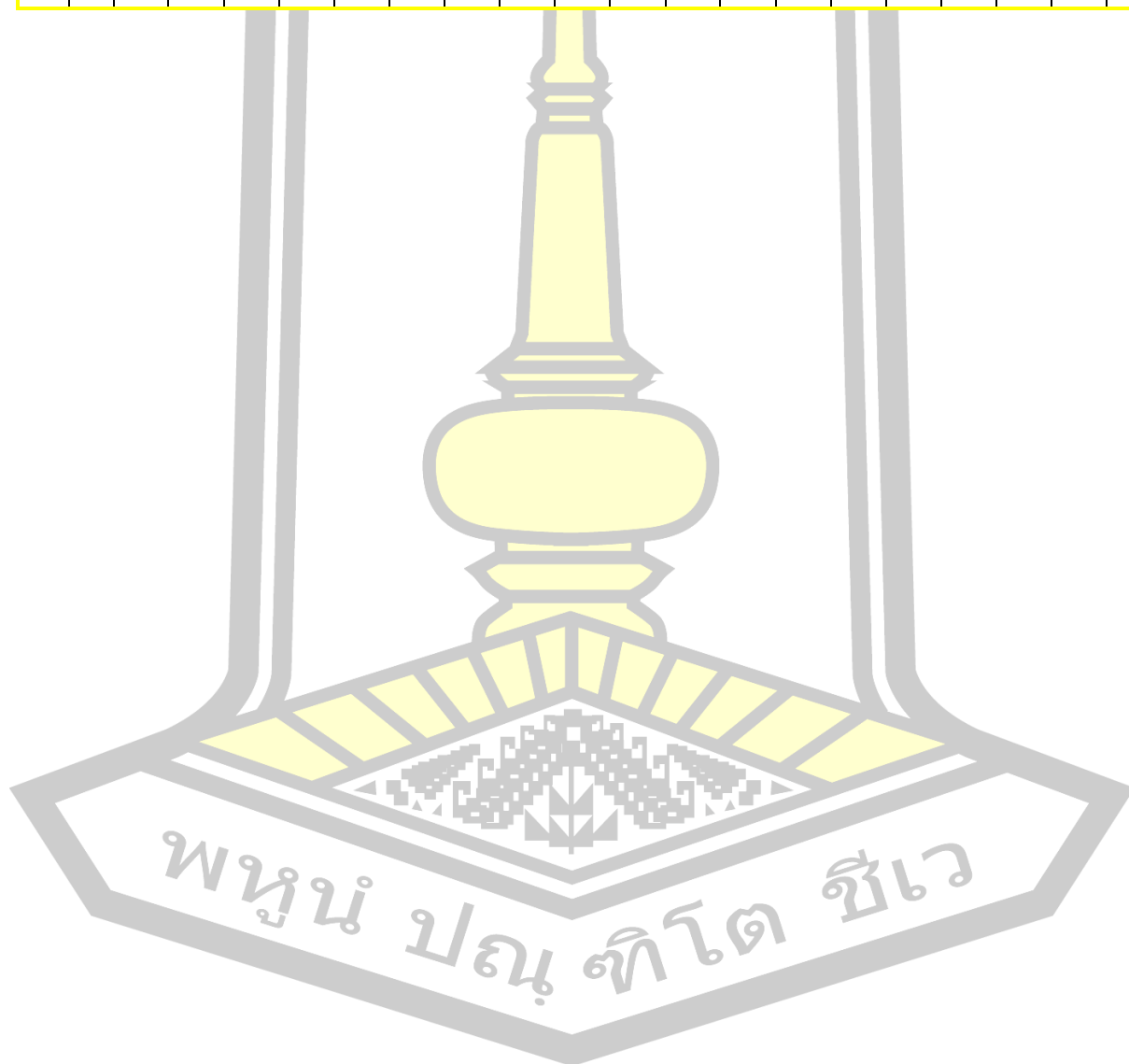
Appendix V-A: IOC (Word Segmentation Test)

Items	Experts			ค่าเฉลี่ย
	1	2	3	
1	1	1	1	1
2	0	1	1	0.666667
3	1	1	1	1
4	1	1	1	1
5	1	1	1	1
6	1	1	1	1
7	1	1	1	1
8	1	1	1	1
9	1	1	1	1
10	1	1	1	1
11	0	1	1	0.666667
12	0	1	1	0.666667
13	1	1	1	1
14	1	1	1	1
15	1	0	1	0.666667
16	1	1	1	1
17	1	1	0	0.666667
18	1	1	1	1
19	1	1	1	1
20	1	1	1	1

ค่า IOC ของข้อสอบ WST

ลงชื่อ
(นางสาวสรินญา พิมพ์ทอง)
ผู้เชี่ยวชาญคนที่ 1

ลงชื่อ
(นางสาวปัณณ์ดิยา เงางาม)
ผู้เชี่ยวชาญคนที่ 2

ลงชื่อ
(นางสาวปริศนา สุขเกษม)
ผู้เชี่ยวชาญคนที่ 3

Appendix V-B: IOC (Suffix Recall Test)

ค่า IOC ของข้อสอบ SRT			
	Experts		
Items	1	2	3	ค่าเฉลี่ย
1	1	1	1	1
2	0	1	1	0.666667
3	1	1	1	1
4	1	1	0	0.666667
5	1	1	1	1
6	1	1	1	1
7	1	1	1	1
8	1	0	1	0.666667
9	1	1	1	1
10	1	1	1	1
11	1	1	1	1
12	1	1	1	1
13	1	1	1	1
14	1	1	1	1
15	1	0	1	0.666667
16	1	1	1	1
17	1	1	0	0.666667
18	1	1	1	1
19	1	1	1	1
20	0	1	1	0.666667

ลงชื่อ

(นางสาวสรินญา พิมพ์ทอง)

ผู้เชี่ยวชาญคนที่ 1

ลงชื่อ

(นางสาวปัณณ์ติยา เงางาม)

ผู้เชี่ยวชาญคนที่ 2

ลงชื่อ

(นางสาวปริศนา สุขเกษม)

ผู้เชี่ยวชาญคนที่ 3

Appendix V-C: IOC (Questionnaires)

ค่า IOC ของ Questions					
Items	Questions	Experts			ค่าเฉลี่ย
		1	2	3	
1	Derivational suffixes knowledge helps develop word knowledge	1	1	1	1
2	Derivational suffixes instruction is a useful approach for vocabulary learning	1	1	1	1
3	Word family construct is beneficial for English language learning and teaching	1	1	1	1
4	Knowledge of derivational suffixes enhances English grammar	1	1	1	1
5	Derivational suffixes knowledge enhances writing skill	1	1	1	1
6	Derivational suffixes foster a reading ability	1	1	1	1
7	My vocabulary is improved through derivational suffixes instruction	1	1	1	1
8	The notion of word families promotes vocabulary learning	1	1	1	1
9	The notion of word families is not helpful to me	1	1	1	1
10	Word families enhance my knowledge of grammar	1	1	1	1
11	Word families help me see the relationship of form-meaning of a word	1	1	1	1
12	Derivational suffixes knowledge enhances my English language ability (e.g., grammar, meaning, and use of a word)	1	1	1	1

ลงชื่อ
(นางสาวสรินญา พิมพ์ทอง)
ผู้เชี่ยวชาญคนที่ 1

ลงชื่อ
(นางสาวปัณณ์ติยา เงางาม)
ผู้เชี่ยวชาญคนที่ 2

ลงชื่อ
(นางสาวปริศนา สุขเกษม)
ผู้เชี่ยวชาญคนที่ 3

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