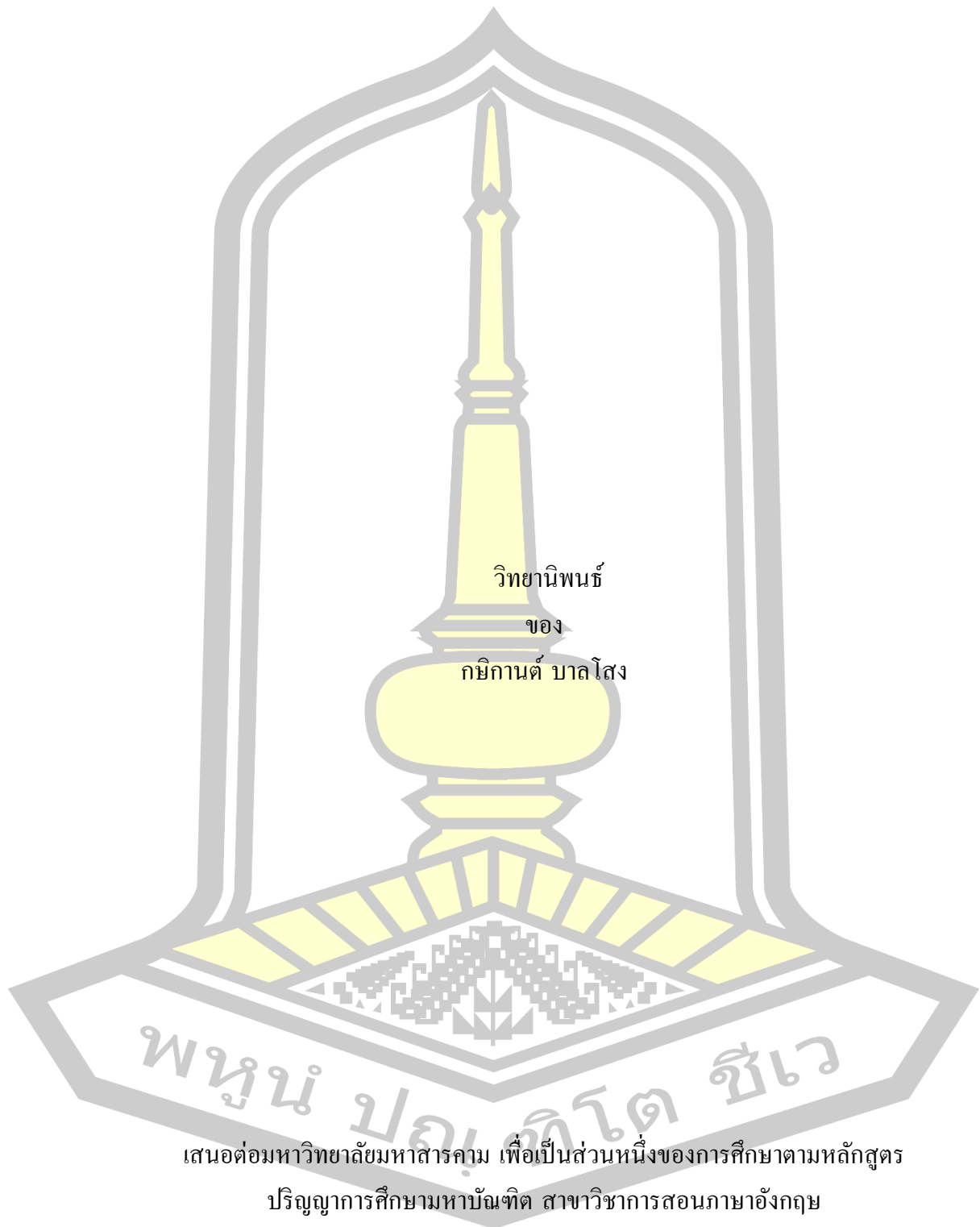The Effects of Multimodal Teaching on English Vocabulary Knowledge of Thai
Primary School Students

Kasikarn Bansong

A Thesis Submitted in Partial Fulfillment of Requirements for

degree of Master of Education in English Language Teaching

May 2023

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The examining committee has unanimously approved this Thesis, submitted by Mr. Kasikarn Bansong , as a partial fulfillment of the requirements for the Master of Education English Language Teaching at Mahasarakham University

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ABSTRACT

It is increasingly prevalent in digital learning research to embrace various meanings, spaces, processes and teaching strategies for discerning a global perspective on creating the student learning experience. Multimodality is an emergent phenomenon that may influence how digital learning is designed, especially during the Covid-19 pandemic in which immersive learning environments, such as a virtual learning platform, were employed. This immersive platform may assist learners in engaging in, paying attention to, and reflecting on their learning. This quasi-experimental study examined the effects of multimodal teaching on primary school learners' English vocabulary and their attitude toward the learning environment. The participants were 59 primary school students in the northeastern part of Thailand. They were divided into two groups: the experimental and the control group. The former consisted of 33 students, while the latter comprised 26. Following Nation's (2013) word knowledge framework, two tests were developed to measure participants' receptive and productive knowledge of the words. L2 vocabulary scholars validated the tests, and the reliability of the tests was checked using Cronbach's alpha coefficient. The questionnaire was also developed to explore the participants' attitudes toward using multimodal teaching methods to improve their vocabulary knowledge. The results showed that although both groups increased their vocabulary knowledge, the statistical analysis revealed that the multimodal teaching technique significantly enhanced participants' receptive and productive vocabulary knowledge. The results also indicated that primary school participants had a positive attitude toward using multimodal teaching methods to improve their vocabulary knowledge. Overall, the current study suggests that the multimodal teaching method effectively improves Thai primary school learners' receptive and productive word knowledge and helps them learn new vocabulary. Other relevant contributions and implications for pedagogical practices are also addressed.

Keyword : multimodal teaching, modality, vocabulary knowledge, Thai primary school learners, classroom contents communication

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

1.1 Background of the study

In language learning, learners usually aim to improve language features (Klein, 1986). Studies in second language acquisition (SLA) offered support for language learning. Such examples are corrective feedback (Li, 2010), second language (L2) strategy instruction (Plonsky, 2011), and L2 grammar acquisition (Shintani, 2015). SLA researchers argue that the vocabulary of the target language is a crucial component of L2 learning (Fehr et al., 2012; Ko, 2012; Nation, 2001; Schmitt, 2008; Yousefi & Baria, 2018). Researchers also suggest that the lexicon is the learners' most crucial language component (Hamada & Koda, 2008; Yamamoto, 2013). Moreover, lexical knowledge plays a vital role in language learning, and it helps increase students' comprehension and efficiency of L2 teaching (Crossley et al., 2009; Hunt & Beglar, 2005). Teaching and learning is the primary activity that all people experience. They learn to know and memorize the alphabet, take notes, and exchange knowledge through books and interaction between the teachers and the learners. Unfortunately, in primary school contexts are hard and tough to keep the class proceed by easily. The students decrease their concentration after the beginning for small durations due to the lack of motivation, boredom, dullness, and attitudes toward language learning. Some students also did not want to raise their hands when the writer or the teacher asked some questions. It was because of students' lack of self-confidence. They were shy and afraid to make mistakes in learning English. They would look down to their table and pretend not to see the teacher. The students were also lazy to memorize the words and mostly depend on their teacher to find the meaning of the word. It can cause the inadequate of words to use English effectively in examinations and completely failing. And some difficulties to understand the reading text and applying appropriate vocabulary in their sentences or paragraphs because of limited vocabulary.

Since the development of teaching approaches has been growing, researchers argue that the educational circle has demonstrated that building the knowledge of young students is quite significant, especially in the era when teaching approaches have been integrated with technology to assist language learning (Kalantzis & Cope, 2008;

MacKenzie & Bathurst-Hunt, 2018). Visual projectors, portable microphones, presentation slides, and software materials are the most common teaching tools found at primary and secondary schools. Therefore, innovation can bridge the real world and the classroom together. Thus, the teachers must create and provide an authentic, seamless, and well-blended education while reinforcing students' autonomy and assisting their keen engagement in the learning procedure (Papadopoulou, 2019). The teacher needs to prepare to initiate the classroom by integrating resources to enhance their lessons. In addition, teaching contents launched differently for each class session, called multimodality or multimodal teaching.

Multimodality means interplaying different representational modes between images, written/spoken words, visuals, symbols, and signs that are as significant as written or spoken (Gee, 2003). Words and images are frequently found on web pages, newspapers, magazines, textbooks or documents. However, conventional curricula mainly provide lessons that are only found in textbooks. That is the only way to enter into the sources of knowledge by reading, writing, memorizing, listening, and imagining. Content is created, argued, and transformed in specific domains via unique ways of thinking, talking, valuing, acting, writing and reading. The multimodal principle refers to the notion that the learners are aware of knowledge and scaffolding of what they gained through various modalities, not only through texts or writing. Indeed, a single textbook might not be sufficient to encourage the students to gain abundant target language input. Therefore, the teachers must move on from old standard indicators or traditional norms to control the direction of teachings in the classroom and cover most of the students.

From this perspective, multimodal teaching offers a notion of using more than one pedagogy. By engaging learners' minds in multiple learning forms simultaneously, the learners experience a diverse learning style that collectively suits all of them. The modes/perception channels to receive and unleash information, such as speech by speaking words or sentences in which learning; audio by listening to words or sentences in which learning and written and print by doing or producing products from what was learned. Furthermore, illustrations may help cultivate the learners to memorize and create images in their minds. That is, learners learn by reacting to

visual cues such as images and diagrams and learning from kinesthetics by responding to tactile cues such as actions and movement (Jewitt, 2008). In brief, multiple modes of illustration include combinations of oral and written language, pictorial, gestural, physical, and spatial representations (Cope & Kalantzis, 2009).

In the EFL context, the popularity of the multimodal teaching in language learning is now increasing, and people find more access to sources of knowledge and information than before (Eisenmann & Summer, 2020). Teachers and instructors have powerful resources to conduct classes or provide high-quality lesson materials. With this in mind, the multimodal teaching would provide innovative teaching strategies for developing language abilities: reading, writing, listening and speaking for the students. Primary students should acquire listening and speaking skills before advancing into structure or grammar. This study emphased on conveying information through the learner's senses using various materials to attract and develop the student's vocabulary knowledge. In general, the learners are satisfied with hearing sounds or seeing the story's images, graphs, videos, and detail. The learner's attention and interaction are the priority to engage. They easily lose concentration when the lessons begin for a small duration and sometimes refuse to cooperate with their teachers or classmates. Thus, the teachers must lead the students to learn how to build meaning and communicative concerns that different audiences might be accessing the particular texts; teachers can provide a route to higher ranks of understanding of language, culture, and communication. (Kern, 2000). Multimedia technologies also motivate and support learners to contrive superior educational directions. Thus, the multimodal teaching has promoted new profits for teachers and learners (Shih & Mills, 2007). In other words, it should increase learners' attention and open their senses to receive teachers' content.

Research shows that multimodal materials play essential roles in teaching, and the multimodal teaching helps relieve difficulty in language learning (Boshrabadi & Biria, 2014; Emerson et al., 2020; Ganapathy, 2016; Johnson et al., 2020). Studies also indicated that the multimodal teaching help attract learners and create short-term memories. Indeed, the multimodal teaching can enhance the student's learning capability and reinforce the student's ability to memorize. Thus, mastery of

vocabulary achieves with teaching methods that apply to various learning styles (Tosun, 2015). The multimodal teaching could be captured through the learners' memories. Active or short-term memory (STM) is the procedure's core (Atkinson & Shiffrin, 1986; Mayer, 2005). The drills or repeating exercises can be engaged after the first teaching orientation to transform the knowledge from STM to passive memory or long-term memory (LTM). Therefore, the process of memorization in a multimodal teaching initiate by two things simultaneously: words and visuals. The transfer from words is moved into the eyes and ears. Visuals are only transferred into learners' eyes. The sounds and images are organized into verbal and pictorial models. These two models are integrated into memory. Therefore, the learners might master the topic the instructors have provided and develop into the LTM by completing many exercises relevant to the lessons.

Therefore, this study focusses on vocabulary development by engaging the students with multimodality to catalyst STM of the students that assisted from visuals and audio. Using multimodal teaching in the language classroom may help the teacher engage the students and encourage students to be more involved and retain more information from the lesson. Students are constantly bombarded with technology and are accustomed to receiving knowledge and information immediately in our fast-paced society. In addition, teaching with a multimodal teaching (videos, audio and images) has become an essential and integrated part of modern learners' learning process.

1.2 Purposes of the study
This study explored the impacts or effects of incorporating multimodal teaching in enhancing students' vocabulary learning. More importantly, the research focused on techniques and tools to improve primary school students' vocabulary learning and learning satisfaction in the classroom. More specifically, the study utilizes various multimodal teaching that include auditory and visual modes encompassing video recording, YouTube videos, Microsoft PowerPoint, animations and songs. Indeed, the study respond to the following research questions:

1. What are the effects of multimodal teaching on vocabulary enhancement among Thai primary school learners?

2. What are the students' attitudes of using multimodal teaching to learning English vocabulary in the classroom?

1.3 Scope of the study

Vocabulary research has shown that EFL learners have inadequate vocabulary knowledge to use English effectively (e.g., Laufer, 2000; Sukying, 2017, 2018a) and no consensus on the best way of learning vocabulary. This study focused primarily on incorporating the multimodal teaching to enhancing vocabulary learning among Thai primary school students, in which English is learned as a foreign language. The participants in the study were from a regional and provincial school located in the countryside of the Northeastern part of Thailand. The instruments were developed based on previous studies and validated before the implementation in the main study. The findings of this study might not be generalizable to other EFL contexts and other education levels. Instead, the study's primary aim was to improve the student's vocabulary knowledge in the classroom, where English is learned as a foreign language, specifically in the regional area of Northeastern Thailand.

1.4 Significance of the study

The study yielded some fruitful information for pedagogical practices. First, the results provided evidence that the multimodal teaching method was an effective tool for improving vocabulary learning among Thai EFL primary school participants. The study also pointed out that multimodal teaching technique benefited L2 vocabulary learning, in both receptive and productive knowledge aspects. Moreover, the results indicated that multimodal teaching helped students engage in and stay focused on their learning. Indeed, the multimodal teaching method highlighted the role of attention, memory functions, and distributed practice that were necessary for vocabulary learning. Memory aids, such as video clips, PowerPoints and visual imagery might help learners remember the concept easily. Furthermore, the study might yield fruitful information for researchers and practitioners, including teachers and students, especially in EFL contexts.

1.5 Definitions of key terms

The multimodal teaching refers to the multi-forms used in classroom teaching to motivate and encourage the students (Sankey, Birch, and Gardiner 2010, p. 853).

Receptive vocabulary knowledge is knowing and remembering language input through listening or reading to comprehend it.

Productive vocabulary knowledge refers to the ability to recall language forms from speaking and writing to expressing messages to others.

Thai primary school learners are Thai students studying in grade six at a small school with less than 100 students. Their age is between 11-12 years old.

Vocabulary knowledge refers to the ability to recognize and know the form, meaning, and use of a word in the learning process.

1.6 Structure of the proposal

This thesis consists of five chapters. Chapter One presents the background of the study, the purposes of the study, the scope of the study, the significance of the research and definitions of key terms. Chapter Two presents the definition of vocabulary, the theoretical frameworks of knowing a word, goals of vocabulary learning, vocabulary learning strategies (VLSs), and word parts strategy. 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 interpretation of those findings to answer research questions. Finally, Chapter five shows the conclusion and discussion of the study, implications of the current study, limitations and recommendations for future research are also presented.

CHAPTER II
LITERATURE REVIEW

This chapter provides the theoretical framework of the current study. The chapter also reviews related studies in order to provide justifications for the study. Specifically, the chapter starts with types of vocabulary (unit of counting) (See 2.1). The chapter follows with the vital concept of knowing a word (See 2.2), the notion of vocabulary learning (See 2.3) and the idea of multimodal teaching (See 2.4). The current chapter also reviews the previous studies to identify the gap and frame the study (See 2.5). The chapter ends with a summary of the chapter (See 2.6).

2.1 Types of vocabulary

Types of vocabulary can be divided by several experts. Every kind of vocabulary has a different purpose such as Aeborsold and Lee (1997) distinguish vocabulary into active vocabulary and passive vocabulary. Active vocabulary cites to vocabulary that utilizes correctly in speaking or writing. In other words, this type of vocabulary indicates productive vocabulary. Nevertheless, putting words of this type into reality is more challenging because abilities to use or comprehend the language's grammar in EFL learners. Passive vocabulary can be known while reading or listening, and it is also mentioned in receptive vocabulary. Passive vocabulary is made up of terms that learners understand while they read and listen.

Lauber (2014) differentiates various types of vocabulary, such as Academic vocabulary, content vocabulary, and support vocabulary are every type of vocabulary. Academic vocabulary refers to words that students use in academic conversations. Content vocabulary is only employed in a specific place or topic and is infrequently utilized outside of that area or topic. Support vocabulary is applied to assist a concept to be easier to understand. Support vocabulary might be found in a passage or text. Moreover, Haycraft and Nation both say the same thing, according to Hatch and Brown (1995). According to Nation, the text contains four types of vocabulary (2001). The first are high-frequency words, which account for over 80% of all written material. The second category is academic words, which account for approximately 9% of all words. Technical terms, which account for about 5% of all words, fall into the third category. The final category is low-frequency words, which occur

moderately frequently. Nation (1994:3) classified vocabulary into two sets based on frequency: high-frequency vocabulary and low-frequency vocabulary.

High-frequency words

High-frequency word is the vocabulary that usually occurs in all kinds of language uses. Those words are part of the 2,000 most common word families in the General Service List (West & West, 1953). The high-frequency words are widely used in written and spoken texts such as newspapers, conversations, novels, academic texts, and informal and casual situations. (Nation, 2008). It covers 80% of most written texts and 90% of spoken texts (Nation, 2008). Most high-frequency lists of words consist of 2,000-word families and are minimal. Apart from that, there are 169 words from the list that are function words such as numbers (one, two, three), pronouns (I, you, she, it), and conjunction (and, or, but). Nation (2008) says that the first list of the target words in any kind of vocabulary, the high-frequency words, should be put on the development program.

Academic words

The Academic Word List is a list of 570 words that frequently appear in academic texts. However, these words are frequently used in academic texts that are less frequently used in writing or speech in casual situations. This is why academic words are difficult to learn, and it is crucial because university coursework is more challenging if the students do not know these words. By the way, studying becomes easier, and the students might succeed more in their studies if they comprehend and use these words easily.

Low-frequency words

Low-frequency words indicate the word families in a continuous text rarely used in everyday English language activities. It only points to the lesser part of the word families in a constant text. This group contains over 100,000-word families.

2.2 The conceptual framework of knowing a word

Vocabulary refers to knowledge of words and meanings. Vocabulary knowledge requires more than simply reciting words meaning. It requires the learner to use the word accurately in context. It is still a multidimensional concept that needs the

acquisition of multiple-word knowledge components (Fernandez & Schmitt, 2020; Henriksen, 1999; Read, 2000; Nation, 2013; Schmitt, 2014).

Anderson and Freebody (1981) give a concept of knowing a word that includes depth and breadth. "Depth" refers to the quality of understanding of a particular word or lexicon. "Breadth" is termed as the amount of individual vocabulary that the students can be comprehended. Compared with the depth of knowledge, breadth of knowledge is easy to describe and construct because the conceptualizations of word knowledge cover numerous associative networks and plentiful polysemous meanings. Henriksen (1999) claims that knowing a word includes three proportions of word knowledge: the knowledge scales of partial-precise features, the depth of knowledge, and the knowledge of receptive versus productive. In general, partial-precise knowledge includes various degrees of word knowledge. Henriksen highlights the points of the acknowledgment of word meaning and form and promotes that vocabulary knowledge contains diverse aspects of knowing a word about the depth of knowledge. Similarly, receptive-productive are slightly differentiated lexical items that are related to the ability to employ and comprehend an individual word.

Nation (2013) gives a framework of the components involved in the acquisition of words. It consists of three major types of word knowledge aspects; form, meaning, and use. In the context of EFL learners, students might initiate scaffolding their knowledge with new knowledge to build stronger background experience at form to meaning and meaning to use. However, human learning techniques depend on personal traits, experiences, and backgrounds. There are neither strategies to claim that what is the best way to deploy in the classroom than multiple techniques. Table 1 illustrates Nation's (2012, p. 49) framework of knowing a word.

Table 1: Knowing a word (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 the meaning?
Meaning	Form and meaning	[R] What meaning does this word form signal?
		[P] What word form can be used to express this meaning?
	Concept and referents	[R] What is included in the concept?
		[P] What items can the concept refer to?
	Associations	[R] What other words does this make us think of?
		[P] What other words could we use instead of this one?
Use	Grammatical function	[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?

According to Nation (2013), knowing a word consists of spoken form, written form, and word parts. Spoken and written form is primary knowledge that assists students in continuing literacy. It allows the students to decipher the meaning and use the word related in a diverse situation. In addition, in receptive, the spoken form is an ability to function a particular word. For instance, people can hear a sound, realize a meaning, and then be able to convey both sound and meaning that make other people comprehend the conversation, branded in place of productive knowledge. It requires words recall knowledge to distribute meaningful communication in properly speaking or writing, which is more challenging either in speech or writing for EFL learners

(Sukying, 2021; Sukying & Yowaboot, 2022). To develop the students' productive skills, teachers should significantly focus on speaking and writing practice (Thornbury, 2002). For receptive knowledge, knowing the written form is an ability to recognize the written form, while for productive knowledge, understanding the written form is an ability to spell precisely the written form that is productive knowledge (Bubchaiya & Sukying, 2022; Schmitt, 2000). Especially grammar and collocations are part of the essential linguistic constraints in selecting a word to use. The grammatical function refers to word classes and grammatical patterns the word can fit into based on rules and concepts of sentences. For example, there are normal to speak or write, 'I bite a lot, I eat a lot, I speak a lot, but there are weird to speak or write,' I bitten a lot, I eaten a lot, I spoken a lot. (Bubchaiya & Sukying, 2022; Schmitt, 2000:31).

In summary, this study follows Nation's (2013) Framework and proceeds with the concept of vocabulary size. The vocabulary size was related to receptive vocabulary knowledge, which focuses on the number of words the learner knows, and productive vocabulary knowledge focuses on assessing the student's understanding of the individual lexical items.

2.3 Deliberate vocabulary learning

Deliberate vocabulary learning is a methodical approach to learning new words and phrases in a second language. It entails making a concerted effort to memorize and practice new vocabulary rather than relying solely on incidental learning (learning new words through context exposure). As a result, the teacher chooses appropriate vocabulary: Learners should concentrate on developing vocabulary pertinent to their needs and interests. This could include words and phrases from their job, hobbies, or areas of study. L2 learners and teachers seek the most efficient method of learning new words because learning a second language entails studying thousands of words. Schmidt's (1990) noticing hypothesis, which states that noticing is required for L2 vocabulary acquisition, underpins deliberate vocabulary teaching. Vocabulary learners who consciously notice L2 features in the input and pay close attention to the form-meaning link of vocabulary items improve their L2 vocabulary learning. Vocabulary is commonly taught explicitly and directly in foreign language classrooms

to compensate for the limited exposure and resources that may otherwise be available. Deliberate vocabulary teaching and learning techniques, according to research, are effective approaches for acquiring L2 vocabulary. (Elgort, 2011; Elgort & Nation, 2010; Hung, 2017; Magnussen & Sukying, 2021). Furthermore, Nation (2013, p. 536) claims that word card-based directed deliberate vocabulary learning is far more effective and efficient than teaching and vocabulary exercises. He also claims that, among other vocabulary learning techniques, teachers should encourage their students to use word cards in learner-centered ways. Oxford and Crookall (1990: p.9-10), on the other hand, denied learning from word cards because using flashcards is a decontextualizing technique that focuses solely on a word and is ineffective in a communicative context. They state that deliberate learning only provides explicit knowledge, which is insufficient for fluent language use, and intentional learning is effective only for a small number of words, which is insufficient for communication. According to Judd (1978; 73), word card learning is isolated, and thus words are not remembered, because learning in sentence context helps associate words - form and meaning. Many academics, on the other hand, advocate flashcard learning, claiming that students can remember the words even after 6 to 42 days (Thorndike, 1908; Webb 1962; Anderson & Jordan, 1928; De Groot, 2006). However, Nation (2013: p.441-442) does mention the drawbacks or the scope of word knowledge that is not covered by flashcard learning as in Table 2.

Form	Spoken	R		
		P		
	Written	R	/	/
		P	/	/
	Word parts	R		
		P		
Meaning	Form and meaning	R	/	/
		P	/	/
	Concept and referents	R	/	
		P		
	Association	R		
		P		
Use	Grammatical functions	R	/	
		P	/	
	Collocations	R	/	
		P	/	
	Constraints on use (register, frequency)	R		
		P		

Notes: R = Receptive knowledge, P = productive knowledge

According to Nation (2013: p. 442-443), flashcard learning is effective for both receptive and productive knowledge in written form, form, and meaning (Table 2). Furthermore, flashcard learning is less effective in receptive spoken form, receptive concept and referents, and grammatical function and collocation use. Flashcard learning, on the other hand, is ineffective in productive spoken form, word parts form, association meaning, and use constraints. To summarize, a flashcard is an effective deliberate vocabulary learning tool for both receptive and productive learning (Yowaboot & Sukying, 2021).

Deliberate vocabulary learning and multimodal teaching can be enhanced by incorporating Nation's (2013) concept of word aspect knowledge. By focusing on the different aspects of words, learners can gain a more comprehensive understanding of new vocabulary and retain it more effectively. ways in which deliberate vocabulary learning, multimodal teaching, and word aspect knowledge can be integrated: using visuals to support word aspect knowledge: Multimodal teaching often involves the use of visual aids, which can be used to support word aspect knowledge by providing learners with a visual representation of the word's form, meaning, collocation, or use. For example, learners may be shown images that illustrate the meaning of a word, or they may watch a video that demonstrates how the word is used in context.

2.4 The underlying notion of vocabulary learning
2.4.1 Information processing theory

Information processing (IP) theory is a theoretical framework based on the idea that humans actively process the information they receive from their senses (e.g., hearing and seeing). Learning is what happens when the brain receives information, records it, molds it and stores it. In information processing theory, as the student takes in new information or knowledge, that information is first briefly stored as sensory storage, then moved to the short-term or working memory and then either forgotten or transferred to the long-term memory (e.g., semantic memories, concepts and general information, procedural memories and images). For learning to occur, information is transmitted from short-term memory to long-term memory because if learners have more than seven pieces of information in their short-term memory at one time, they get an overload called cognitive overload. Indeed, humans cannot process all

information simultaneously as they, by nature, are limited processors; therefore, controlled processing is limited in number as it exerts higher demand on cognitive skills (Saville-Troike & Barto, 2017).

According to IP theory, language skills are learned in three stages: input, processing and output (production). Input involves any representative samples of the target language that learners come across. Indeed, Schmidt (2001) suggests that learners must first pay attention to any aspects of the language they are trying to learn or produce. More precisely, the input can be anything that uses up the learner's mental processing space and can contribute to learning, even if the learner is unaware of it or attending to it intentionally. Therefore, learners initially tend to use most of their resources to understand the main words in a message. In this regard, learners may overlook the grammatical morphemes attached to some of the words, especially those that do not substantially affect meaning. Through experience and practice, new information becomes easier to process, and learners can access it quickly and automatically. This frees up cognitive processing resources to notice other aspects of the language that, in turn, gradually become automatic. Information processing approaches to second language acquisition (SLA) have been studied by many researchers (Anderson, 1995; DeKeyser, 2007; Lightbown & Spada, 2013). Research suggests that most learning starts with declarative knowledge, that is, the knowledge they are aware of, for example, a grammar rule. The hypothesis is that, through practice, declarative knowledge may become procedural knowledge or the ability to use the knowledge. With continued practice, procedural knowledge can become automatized, and the learner may forget having learned it first as declarative knowledge.

2.4.2 Noticing hypothesis

In learning vocabulary, Nation (2001) gives a strategy in which a learner writes a foreign word on one side of a small card and its translation in the first language, called the flashcard strategy (Nation, 2001; Yowaboot & Sukying, 2022). Schmidt's (1990) perceiving hypothesis for vocabulary teaching. Noticing is a primary concept for L2 vocabulary acquisition (Schmidt, 2001). Learners consciously notice language characteristics and pay attention to the form-meaning. Thus, vocabulary is generally

taught explicitly and directly in classrooms to compensate for the inadequate resources that may make available. The previous study pointed out that careful vocabulary teaching and learning techniques, such as notebooks, word lists, and word cards, are beneficial approaches for acquiring L2 vocabulary (Elgort, 2011; Elgort & Nation, 2010; Hung, 2017; Magnussen & Sukying, 2021; Yowaboot & Sukying, 2022).

In this study, the multimodal teaching consists of three teaching themes: visual aids learning, music lessons, and classroom activities. Firstly, visual aids learning is similar to a digital flashcard. Still, the researcher improves it into animated images and provides audio of those words in the lessons through sound recording. So, the noticing hypothesis of the first theme is "did the visual aids could be enhanced the vocabulary knowledge of the primary school students than memorizing it from their notebook?"

Secondly, the music lesson aims to improve the students' memorization through a lyric and by using the tone of the music to create an earworm situation for the students. In the second theme, the hypothesis is "did the music lesson improves students' confidence to say the words in English or meaning in L1 than repeating drills?"

Lastly, the classroom activities focus on communication, and the students have to cooperate and complete the task within a limited time. At this theme, "did the classroom activities increase the student's awareness of the target words than keep asking the students individually?"

2.5 The concept of the multimodal teaching approach

Multimodality can be described as the multiple human sensory organs interacting with the outside world (Yueguo, 2007), which can stimulate different human senses. There are generally five communication modalities: visual modality, auditory modality, tactile modality, olfactory modality and gustatory modality.

Additionally, the researchers define multimodality as a way of characterizing a communicative situation that is considered very broadly, relying upon combinations of different 'forms of communication to be effective. It showed that people use

multimodal teaching to communicate by simultaneously using different modes, such as moving images, speech, writing, layout, gesture, or proxemics. Besides, the methods of communication can be divided into two types: verbal, spoken, and written. And non-verbal, including pictures, emojis, sounds, animation, and gestures (Adami, 2016; Bateman et al., 2017; Sharples, Rooc, & Ferguson, 2016).

Several researchers reflect and emphasize multimodality as a communication training using modes of benefits to develop and convey a subject or content. In the classroom, the teachers use speech and gestures when explaining or giving knowledge by giving coursework or quizzes, which clarify multimodality is a more collaborative, constructive, and interactive way of teaching. Thus, the learning process was more meaningful and can improve students' understanding, and it could motivate the students to engage more in a class with numerous modalities. From the previous literature review, it emphasizes that multimodal teaching has a significant impact on student's motivation (Beetham & Sharpe, 2013; Falk-Ross & Evans, 2014; Ganapathy & Seetharam, 2016; Papageorgiou & Lameras, 2017; Varaporn & Sitthitikul, 2019b; Marantika et al. 2021).

Li (2022) claims that integrating a multimodal teaching emphasizes the relationships between task-based and communication. This study requires the integration of various communication modes in teaching by using multiple senses simultaneously. Hence, English teachers would apply theoretical knowledge to practical teaching to train students' practical abilities. The process of learning English is also a process in which students acquire information Teachers can use scientific teaching methods to enable students to efficiently acquire what teachers teach to learn English efficiently. To design the multimodal teaching, teachers would assimilate teaching environments, contents, purposes, and additional factors to design interactive and scene simulation activities to convey knowledge by listening, speaking, reading, writing, and participating in classrooms. At the same time, body language teachers can be used to assist in teaching. For Example, stance, movement, facial appearance, and eye contact can convey different visual signals to stimulate students' visual senses and deepen their understanding of lessons (Li, 2022).

In teaching and learning contexts, explicating "different aspects of multimodality with diverse epistemological and methodological approaches" (Yi et al., 2019, p. 164). These contain, but are not restricted to, social semiotics, systemic functional linguistics, and multiliteracies. For example, potentials for making meaning a social semiotic perspective focuses on the affordances or the social and cultural practices surrounding the procedure and creation of multimodal texts, with a particular focus on identity development. Despite these differences, researchers working within this umbrella of theories converge in their common focus on the "meaning of all its appearances, social occasions, and cultural sites.

2.5.1 Multimodal approach principles

Traditionally, the term modality has been used in L2 education to refer to channels of linguistic communication (e.g., speaking, writing). This perspective relates to the connection among modalities of language (e.g., speaking-writing connections; Hirvela & Belcher, 2016). Further, lately, the term mode increases social and cultural shape resources for creating meaning which includes linguistic and nonlinguistic modes such as visual image and gesture. Thus, multimodality refers widely to the arrangement of multiple modes that are linguistic and nonlinguistic together in communication events. For clarity, the following terminology was divided into two groups such as mode (e.g., language, visual image, gesture) and modality (e.g., listening, reading, speaking, writing) (Grapin & Llosa, 2020).

From Syodorenko's (2010) perspective, multiple modalities are believed to improve language acquisition. This view is reinforced by Paivio's (1986, 1991, 2007) Dual Coding Theory; the main hypothesis is that two different schemes handle verbal and non-verbal motivations, and then these verbal and non-verbal systems act together. The initiation of both systems together results in good remembrance. This clarifies why L2 learning can be enlarged by combining visual images with verbal information. Vocabulary learning from written text (Al-Seghayer, 2001; Chun & Plass, 1996a, 1996b; Plass et al., 1998, 2003) and auditory passages (Jones & Plass, 2002) can be improved if new words have descriptions or subtitles with both verbal input and images input than only one input. Conversely, there are conflicting results on the effect of static images against dynamic images. Al-Seghayer found that

multimedia subtitles of video and text can be directed the students to superior vocabulary learning than pictures and text.

Nevertheless, the contrary was found by Chun and Plass (1996a). A potential purpose for the mixed results is the features of the images for sample, concreteness or familiarity. In studies with video input, gestures and facial expressions have been found to assist listening comprehension in the L2 (Hernandez, 2005; Sueyoshi & Hardison, 2005; Syodorenko, 2010). However, Baltova (1994) argues that authentic videos help students to comprehend information through visual images but do not increase their understanding of the language. To support the students, videos are regularly amplified with text that appears in the video in various forms, such as subtitles (L1 text, L2 sound), reversed subtitles (L1 sound, L2 text), and captions (sound in the same language as the text). Regarding comprehension, it is not guaranteed that on-screen text appearances are most advantageous (Baltova, 1999; Lambert, Boehler, & Sidoti, 1981; Markham & Peter, 2003; Markham, Peter, & McCarthy, 2001; Nation, 2013). Danan (2004) recommends that L1 caption be a procedure with tough material; then, captions in L2 are used. In vocabulary learning, L2 text results in similar improvements and is better than subtitles for recall and recognition (Baltova, 1999; Danan, 1992; Lambert et al., 1981).

Numerous studies inspected the impact of captions on learning vocabulary as evaluated by written tests (Baltova, 1999; Danan, 1992; Neuman & Koskinen, 1992). At least one study evaluated learning through aural tests (Markham, 1999). These scholars' examinations follow Nation (2001), which can be classified as recognition of form, recall of form (c-cloze, fill-in-the-blank, free recall), and recall of meaning (L2 to L1 translation). The results indicate that video, audio, and captions (VAC) create directions to enhanced performance on written and aural tests. The appearance of video and audio (VA) found at least two gaps which make it challenging to simplify the results. First, the studies begin with the participants' different ages and proficiency levels. It is hard to determine from the participants' descriptions to compare proficiency. The study participants are categorized as beginning, intermediate, and advanced. For this grouping, it seems that the auditory vocabulary achievement of beginning and intermediate learners was not studied. Moreover,

previous research has only investigated aural vocabulary recognition but not recall. Form recognition remains unlike form recall or translation because less cognitive processing is necessary for form recognition. To decide which is being learned from the VAC input, the researchers should evaluate the student's performance on recognition and recall vocabulary tests in written and aural modalities (Nation, 2001).

According to Li (2022), the multimodal teaching aims to enlighten students' perceptions of language learning by using modern science and technology to apply the multimodal teaching to a classroom, making students' English learning more efficient and scientific. It could change English from mind-numbing to energetic, boring to enjoyable, and passive to active (Li, 2022).

In this study, the multimodal teaching used more than senses for collaboration in language teaching. The method of the current study emphasizes the refinement of students' abilities and promotes the use of images, role play, and other passages to organize the students' senses. In the process of multimodal teaching, students can recognize, comprehend, translate and store the input, which lay a basis for awareness and automatic output of information. In summary, a multimodal teaching mainly uses diagrams, words, colors, pictures, symbols, movements, auditory clips, videos, or tangible objects to construct teaching material and explain or organize classroom interaction.

2.5.2 Benefit of the multimodal approach

Multimodal can engage all students in the learning process, and every student has at least one modality learning preference at some point during the lesson. From the principles stated in 2.4.1, most results show that learning through multiple communication modalities improves content retention, such as enhanced written and aural recognition and recall performance. It also brings real-world content into classroom interactions. Pictures, sounds, words, and movements create an immersive for the students to attract them with what is in the monitor that can describe words through captions or clarify the captions through videos. Moreover, those profits might be improved the student's skills in all modes. In addition, without variety, learning can be predicted and causes the students to disengage from the content. Introducing students to all modalities prepares the world of diversity into the lessons to break the

classroom walls into universities, relationships, and careers. Also, it increases the creativity of teachers and students. Creativity could be inspired by cooperative learning by teachers and students. Through peer interactions, teachers can conduct a discussion time or presentation according to their learning styles for the students and their classmates to reinforce their learning and gain a new perspective and motivation to improve their proficiency (Ferguson, 2022).

2.6 Relevant studies

Many studies have been done using the multimodal teaching to improving students' vocabulary knowledge. This section will outline previous studies in multimodal teaching.

The multimodal teaching could draw the student's attention and promote vocabulary learning. Zarei and Khazaie (2011) used different content delivery modes through the laptop-based delivery of multimodal items to improve vocabulary learning among 158 Iranian learners of English. They found that adequately programming mini-laptops could encourage the student's learning conditions, and their findings also rendered fruitful information for developing teaching lessons and modes. Moreover, Gilakjani & Ismai (2011) indicated that multimodal designs helped language learners to cope more efficiently as they faced new modes of information presentation. Gilakjani and Ismai (2011) also noted that multimodal teaching methods encouraged cognitive involvement and social interactions through digital online communications.

Boshrabadi and Biria (2014) investigated the effects of multimodality on EFL learners' reading comprehension and vocabulary retention in the context of Iran. The results demonstrated the effectiveness of using multimodality in L2 reading classrooms and EFL learners' vocabulary retention. The qualitative data analysis also revealed that learners preferred texts to be accompanied by visual images. Another study by Ganapathy and Seetharaam (2016) explored Malaysian students' perspectives on the use of multimodal teaching using focus group interviews. The results confirmed the need to reorientation the teaching and learning of ESL with a focus on multimodal pedagogical practices as it promoted positive learning outcomes among students. The study also suggested that the multimodal teaching integrated into

the teaching and learning of ESL could encourage students' autonomy in learning, improve motivation to learn, and facilitate various learning styles.

Keough et al. (2019) investigated learning effects in multimodal perception with real and simulated faces. Fifty-six native English speakers, 31 females and 25 males, participated in this research. The experiment was continued with an iMac PC that used a program called PsychoPy. The result showed that there was no variance between the virtual face, voice "pa", and voice "ba". It was also found that computer-generated and voice faces were biased towards "pa" equally well with virtual and real faces. Kayumova and Sadykova (2019) investigated Educators' perspectives on implementing a multimodal online program for kindergarten learners. The results showed that multimodal content presentation allowed the teachers to engage their students and suggested that the study results were restricted overall because of the fewer applicants.

Lan, Shih, & Wang (2018) probed into vocabulary and reading performance using a multimodal learning analytics approach. Seventy students participated in this study and were divided into two groups: an experimental group and a control group. The results showed that the multimodal teaching was found to have significant learning outcomes. It was also found that the multimodal method could motivate and enhance students' vocabulary learning and reading performance. In addition, Pintado and Fajardo (2021) examined the multimodal teaching effects on teaching English idioms at the University of Cuenca, Ecuador. The results showed that the multimodal teaching had positive outcomes when teaching English idioms to EFL students. The findings also indicated that the activities used during the classes were dynamic and broke the traditional practices used to teach these non-formal words. Furthermore, Cárcamo et al. (2016) examined the influence of multimodality on vocabulary acquisition among 8th, 9th, 10th, and 11th graders, from two semi-public schools in Chile. They found that multimodality significantly improved vocabulary acquisition among 145 school students. Together, these studies prove that multimodality greatly benefits students learning new vocabulary and language skills.

Recently, Harchegani and Sherwan (2021) investigated the impact of multimodal discourse on Iraqi EFL learners' writing skills. They found that the experimental

group significantly outperformed their control peers in writing. Moreover, Laadem and Mallahi (2019) found that multimodal modes positively affect students" motivation and teacher-student interaction from multimodal pedagogy articles. They also argued that multimodal pedagogy was better than traditional teaching methods.

In the Thai context, Yimwilai and Phusri (2018) studied the effectiveness of a multimodal teaching to reading ability. The participants consisted of 30 students majoring in science at a university in Thailand. The findings showed that a multimodal teaching significantly improved Thai non-English major students' reading skills. The results also demonstrated the university participants' satisfaction with the multimodal teaching method. Ronglong (2019) analyzed the translation strategy by investigating and reviewing the literature on multimodal to find appropriate ways to improve the further translation of children's pictorial books focusing on picture books for children, multimodalities in picture books, and interpreting multimodal elements. The study showed that multimodalities of picture books benefited students' language skills. More recently, Sakulprasertsri (2020) explored the integration of multimodality into English classroom practices among ten English teachers and 317 students through the use of different semiotic modes such as scripts, voice, music, and images through multiple semiotic resources. The questionnaire analysis revealed that integration could provide many benefits, and the results pointed out that integrating different modes impacted students' engagement in the lesson. One study by Panyasorn and Suksakulchai (2018) found that the use of visual aids, such as pictures, diagrams, and videos, along with traditional classroom teaching, can improve students' vocabulary acquisition. The study found that the use of visual aids increased student engagement and motivation, which in turn led to greater retention of vocabulary words.

Another study by Chomchaiya and Intraprasert (2019) investigated the use of songs in multimodal teaching to improve vocabulary acquisition among primary school students. The study found that songs can be an effective tool for vocabulary learning as they engage students in a fun and interactive way. The study also found that songs can help students remember new vocabulary words and their meanings.

In addition to visual aids and songs, other modes of communication can also be incorporated into multimodal teaching to enhance vocabulary learning. For example, a

study by Pornrattanacharoen and Vongurai (2017) investigated the use of games in multimodal teaching to enhance vocabulary acquisition among primary school students. The study found that games can be an effective way to teach vocabulary as they create a more engaging and interactive learning environment.

In summary, the conclusions of the earlier studies offer a practical indication that many related characteristics of word knowledge can simplify vocabulary acquisition and language improvement. These results show that multimodal teaching support and increase students' vocabulary acquisition. The relationship of the previous study presented helpful effects of teaching multimodal by using numerous learning strategies. Numerous researchers strongly suggest the multimodal teaching because it can apply to various learning styles. Therefore, the capability supports the three main learning styles: auditory, visual, and kinesthetic (Kahn and Kellner, 2008; Kress, 2000; Jewitt, 2008; Yimwilai and Phusri, 2018). These acknowledgments lead to better academic achievement. Students received information from one or more modalities through which they learn best. Overall, the literature suggests that multimodal teaching can be an effective approach to vocabulary enhancement among Thai primary school learners. By incorporating multiple modes of communication, teachers can create a more engaging and interactive learning environment that can help improve student motivation and vocabulary learning outcomes. The use of visual aids, songs, and games are just some of the many ways in which multimodal teaching can be implemented in the classroom to enhance vocabulary acquisition among primary school learners in Thailand.

2.7 Chapter summary

Vocabulary is a crucial part of language learning processes, especially in English, all four skills: listening, speaking, reading, and writing. Vocabulary knowledge includes three core aspects: form, meaning, and use, and two procedures: receptive and productive. Based on the literature review, this research focused on grade five primary learners at a private school in Thailand, and vocabulary knowledge aims at CEFR – A1 level of 1,050 English words compared and selected from the student's textbook. To achieve this level of work knowledge, the multimodal teaching is used in this study because the multimodality teaching strategy significantly increases learning

capability and gives positive outcomes through the overall results of the previous studies. Research also shows that multimodal strategies could enhance lesson materials to raise learners' motivation to learn and interact with communication channels that bridge outer sources and classrooms. It is assumed that the multimodal teaching is a better way to increase vocabulary knowledge by using multiple ways to engage the students' modality. Furthermore, the literature still raises questions about whether multimodality could have better motivation for students, whether using multimodal is better for primary students than using the traditional method, and how to design the study to attract and enhance the vocabulary learning ability of students. The following chapter will present the research methodology for the study.
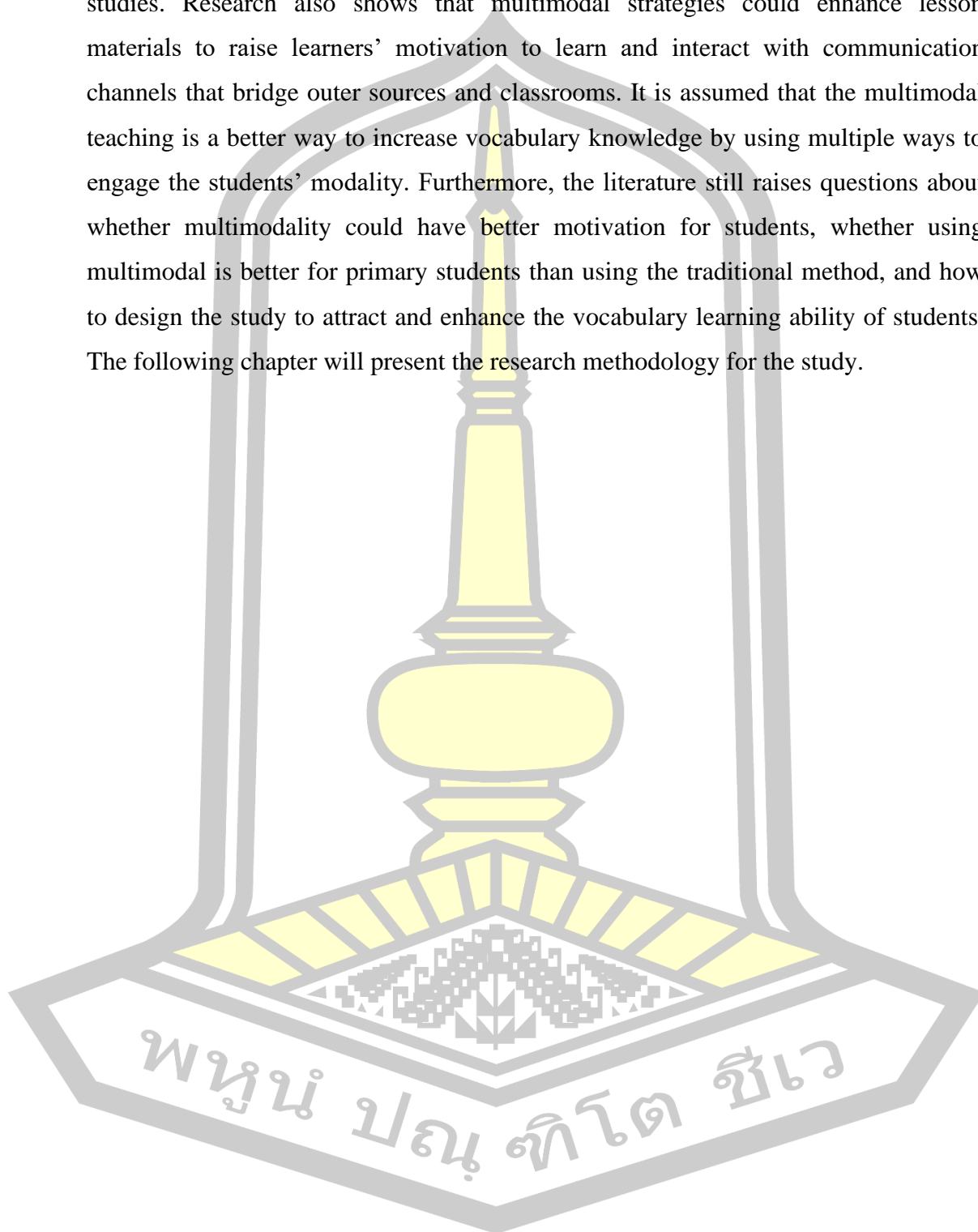
CHAPTER III
RESEARCH METHODOLOGY

This chapter presents the research methodology of the study. The chapter begins with a general description of the research design (3.1) and research methods (3.2). The research methods consist of participants and setting (3.2.1), instruments or techniques (3.2.2), test development (3.3), data collection procedure (3.4) and data analysis (3.5). The chapter ends with a chapter summary (3.6). Other detailed descriptions of each section will be presented in the following sections.

3.1 Research design

This quasi-experimental research in language classrooms is popular in applied linguistics and educational research. This study employs action learning in a language education context broadly underpinned by the assumption and approach embodied in action research. Educational practitioners and professionals often use this research to examine and improve their pedagogy and practice in language classrooms. In this regard, the primary aim of this design is to conduct research to bring about positive change and improvement in the student participants' classroom and enhance the collaboration and involvement of student participants who are actors in the classroom and most likely to be affected by changes. It also established an attitudinal stance of continual change, self-development and growth. Theoretically, when students are actively engaged in learning, the classroom can be dynamic and uncertain, demanding the constant attention of the teachers. Considering these demands, teachers can often only engage in fleeting reflection for accommodation, modification or formative assessment. As such, this design offers one path to a more deliberate, substantial and critical review that can be documented and analyzed to improve a teacher's pedagogical practice in language classrooms.

With this deductive reasoning, the current study used a quasi-experimental design to determine the effect of pedagogical practice in a language classroom. The study is considered a quasi-experiment because the participants cannot be randomly selected into groups. Instead, the researcher takes up the intact class as a pre-and post-test study to see the influence of multimodal teaching approaches. Deductively, it is hypothesized that the multimodal teaching would improve primary school students'

vocabulary knowledge. However, the current study takes nine weeks to determine whether a multimodal teaching can enhance primary school students' vocabulary knowledge with an emphasis on the form and meaning link of the word.

3.2 Research methods

3.2.1 Participants and setting

The study was initiated at a private primary school in the northeastern part of Thailand. The participants were 59 Thai students from primary school grade 5 as an experimental group (n = 33), grade 6 as a control group (n = 26) from the private school-age ranges between 10 - 12 years old. Participants were selected by the classroom context. They lived in the same environment where most parents had to work far from home in an industrial province. All students had a similar language proficiency level in this study. They learned English as a foreign language, and they met the teacher twice per week, one hour at a time. Thus, this study discussed the effects of the multimodal teaching on the students' vocabulary improvement and their attitudes toward the multimodal approach. In this study, L1 was the primary vehicle to communicate with their friends or classmates at school, and none of the students had studied English in an English-speaking country.

The study took nine weeks and was only set at a private primary school in Thailand's Northeastern region. All participants took two hours per week to study in a multimodal context. They rarely accessed vital sources like the internet, news articles, and movies. More than half of the participants lived with their grandparents due to the father and mother having to go to work at the factory in the capital or industrial area. They also reported that the community around them was rural, which caused difficulty in improving their vocabulary knowledge or fossilization.

3.2.2 Instruments/techniques

Two research instruments were deployed to investigate the effects of the multimodal approach. The first instrument is a Vocabulary Knowledge Test (Receptive and Productive) to assess the student's vocabulary knowledge before and after the multimodal orientation, and the second was an attitude questionnaire. The information about the instruments is provided in detail in the following sections.

3.2.2.1 Receptive Vocabulary Knowledge Test

This study used the Vocabulary Knowledge Test (VKT), adapted from Promluan & Sukying (2021), to measure the students' vocabulary knowledge. The students' receptive knowledge test was presented in multiple-choice for 20 items to measure spelling and understanding of the target word from the L1 text (See Appendix B).

The test included only the vocabulary from the extra book for primary school level 5. All questions asked for the most corrected spelling of English words from Thai meaning with four choices. The samples of receptive vocabulary knowledge test followed:

1. จงหาคำแปลที่ถูกต้องของคำว่า "หิมะ"/ Find the correct translation of the word

    ก. Snew

    ข. Snow

    ค. Snuw

    ง. Snaw

2. จงหาคำแปลที่ถูกต้องของคำว่า "เผาไหม้"/ Find the correct translation of the word

    ก. Born

    ข. Brunt

    ค. Burn

    ง. Bern

3.2.2.2 Productive vocabulary knowledge test

The productive vocabulary knowledge test were adjusted from the Expressive One-Word Picture Vocabulary Test (Brownell, 2000), Adapted from Magnussen & Sukying (2021). The test procedure begins with a picture representing the target word presented to each student (See Appendix C).

The teacher was provided images and the meaning of words in L1 on the projector screen for 20 pictures (1 picture/ 3 minutes) and let the students write down the answer in their answer sheets. They were supported to produce the word they thought toward the picture represented. A pretest and posttest results were used to compare and discuss the multimodal approach's effects on vocabulary knowledge development in Thai primary school EFL learners. The samples of productive vocabulary knowledge test are as follows:

1. จงเขียนความหมายของภาพที่กำหนดให้เป็นคำภาษาอังกฤษ/Write the meaning of the picture given in English words.

   ภาพ/image = กล้องถ่ายรูป/a camera

   คำตอบ = camera, a camera คำแปล กล้อง, กล้องถ่ายรูป

2. จงเขียนความหมายของภาพที่กำหนดให้เป็นคำภาษาอังกฤษ/Write the meaning of the picture given in English words.

   ภาพ/image = ร่ม/ an umbralla

   คำตอบ = umbralla, a umbralla an umbralla คำแปล ร่ม

3.2.2.3 The questionnaire

The survey was modified from Yamashita (2013); extensive reading by Promluan & Sukying (2021) into a multimodal teaching context. The attitude questionnaire was based on the Index of Item-Objective Congruence (IOC). Each question was rated on a 3-point scale, with +1 indicating congruence, 0 indicating uncertainty, and -1 indicating incongruence. The questionnaire in this study consists of 15 questions that examined the students' attitudes toward multimodal teaching. The students are going to fill the 5-point Likert scale ranging from 1=strongly disagree to 5=strongly agree, which contain the same questions and have the same format twice in the first week as a pretest of their attitude and the last week as a posttest to inform their attitude change towards the multimodal approach.

Table 2: Example of the attitude questionnaires

*(**Instructions**: ให้นักเรียนทำเครื่องหมาย (/) ลงในช่องที่ตรงกับความรู้สึกหรือความคิดเห็นของนักเรียน แต่ละคำถามสามารถเลือกตอบได้เพียงคำตอบเดียวเท่านั้น)*

ข้อความ	ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง
1.ฉันเข้าใจคำศัพท์ในหนังสือเพิ่มขึ้นหลังจากเรียนด้วยการสอนหลายรูปแบบ			/		
2. สื่อการสอนเหมาะสมกับเนื้อหาและตัวชี้วัด			/		

3.3 Test development

To find out the effects of multimodal strategy instruction. The researcher designs the vocabulary tests, namely the Vocabulary Knowledge Test (VKT) and the Expressive

One-Word Picture Vocabulary Test (Brownell, 2000), Adapted from Magnussen & Sukying (2021), to measure students' vocabulary knowledge in two aspects; form, and meaning. The test was deployed before and after the teaching with the approach. Each test contained 20 questions. All the vocabulary was picked from students' textbooks for grade 5. The test-developing process begins with specifying the purpose of the tests, followed by the researcher creating the test and scoring rubrics. After that, the tests had been reviewed and piloted. Lastly, all instruments were evaluated the quality by experts.

Word selection criteria

Laufer and Nation (2012) suggested that vocabulary selection criterion consisted of frequency, usefulness, and learnability/difficulty. In this current study, the frequency was used as a criterion for selecting the target words. Words with high frequency were more likely to provide a better return (Laufer, 2014; Nation & Webb, 2011; Nation, 2011, 2013b; Promluan & Sukying, 2021). In general, high-frequency words frequently appear in all kinds of situations, such as speaking and writing, without context awareness (Nation, 2013). Therefore, high-frequency words should be lined up in language teaching, particularly for lower-level EFL learners (Laufer, 2014; Nation & Webb, 2011; Nation, 2011, 2013a, 2013b; Promluan & Sukying, 2021). However, without understanding these words, the students agonized over their L2 comprehension and production (Nation, 2013a, 2016; Promluan & Sukying, 2021). The criteria for selecting the target words for the current study based on Promluan & Sukying (2021) is following by five steps such as:

1. The target words were selected from the reading part in the Extra and Friends 5 student textbook.
2. All the target words must appear in the student textbook for the current study.
3. The list of the target words with a different group of students with similar circumstantial English skills.
4. Participants in the pilot study rated known words as excluded from the target words.
5. The final list of target words was used to assess participants' vocabulary knowledge in the vocabulary knowledge scale test.

To discover the multimodal instruction on the student's receptive and productive vocabulary, the teacher runs the vocabulary tests; namely the L1 translation test, word segmentation test, and word part use, to assess students' vocabulary knowledge in two aspects; form and meaning. The test launches before and after the instruction. Each test consisted of 20 questions, and all the vocabulary was selected from students' textbooks for grade 5. The procedure when developing the tests begins with specifying the purpose of the tests, followed by the teacher creating the test and scoring rubrics.

Table 3: Example of the vocabulary checklist test

Vocabulary	Know	Unknown	Meaning
Above		/	-
Answer	/		คำตอบ
Art	/		ศิลปะ
Actor	/		นักแสดง
Africa		/	

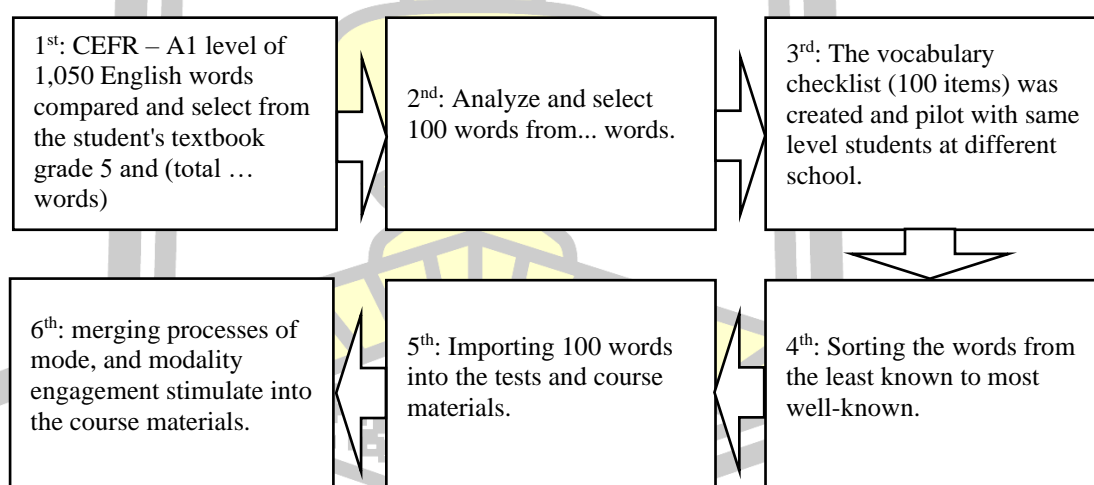|		
1st: CEFR – A1 level of 1,050 English words compared and select from the student's textbook grade 5 and (total … words)	2nd: Analyze and select 100 words from... words.	3rd: The vocabulary checklist (100 items) was created and pilot with same level students at different school.
6th: merging processes of mode, and modality engagement stimulate into the course materials.	5th: Importing 100 words into the tests and course materials.	4th: Sorting the words from the least known to most well-known.

Figure 1: A summary of the process used to select and promote words into course materials

The procedure of the current study consists of three multimodal instruction formats: first, visual aids language learning classroom. Second, music-based language learning, and lastly, competitive classroom activities. The visual aids language learning is to present the visual slides from the CANVA application that can integrate sounds and video in the drops. This method aims to emphasize the students' memorization and increase their capability to notice words. Music-based learning uses CANVA to integrate songs and lyrics into the presentation. This method focuses on listening and pronouncing from the rhyme, melody, and rhythm. The competitive activities are to decrease stress and anxiety. Therefore, the activities are still covered with the vocabulary in the material called "Board race game". The Board race initiate by breaking the students into three groups, each group have to complete the word on the board, and the winner received rewards such as snacks or milk-tea. However, this is not often focused on in classrooms, especially in Thai EFL contexts. Multimodality can easily define as practicing in terms of the textual, aural, linguistic, spatial, and visual resources used to compose messages. So, teachers would apply more multimodal tasks to raise the students' awareness.

Figure 2: A CANVA slide for visual aids learning example.

Figure 3: A CANVA slide with a question.

LET HER GO'S LYRIC

*Well, you only n____d the light when it's burning l___
Only m_ss the s___ when it starts to s___w
Only know you love her when you let her go
Only know you've been h___h when you're feeling l___
Only ha___ the road when you're missing home
Only know you l___ her when you let her go

Staring at the bottom of your g___s
Hoping one day, you'll make a ___am last
But dreams come slow, and they go so f___
You see her when you close your ___es
Maybe one day, you'll understand why
Every___ you touch surely dies

But you only need the l___ when it's b___ing low
Only miss the sun when it's ___ to snow
Only know you l___ her when you let her go
Only know you've been high ____ you're feeling low
Only hate the r___ when you're missing h___
Only know you love her when you let her ___

Staring at the ceiling in the ___k
Same old ___y feeling in your heart
'Cause love c___s slow, and it goes so fast
Well, you see her when you fall asleep
But ___ to touch and never to keep
'Cause you loved her too much, and you dived too d___
*

Figure 4: A lyric exercise example

3.4 Data collection procedure

Data collection took about two months and takes place during class. The two vocabulary knowledge tests were given on different days. Given that form vocabulary knowledge can be transferred to other aspects (Laufer & Goldstein, 2004; Magnussen & Sukying, 2021 and that 'meaning'' knowledge; Webb, 2005), the Vocabulary Knowledge Test was given first, and followed by the One-Word Picture Test. After the pre-testing, students received multimodal instruction for 16 hours or eight weeks. All participants received an average of 4 hours of English instruction per week, including 2 hours of multimodal instruction per week. The day after the final lesson, all students were again given the two tests. Then, all students who participate in this study were requested to complete an attitude questionnaire. Participants are allowed to use dictionaries.

The quantitative data was retrieved from a vocabulary knowledge test based on the Vocabulary Knowledge Test (VKT), adapted from Promluan & Sukying (2021). The posttest has the same procedure as the pretest at the beginning of the study. Thus, the test results lead to discussions on the effectiveness and appropriateness of the multimodal teaching for primary students that might answer Question 1. The qualitative data was collected from the 15 questionnaires in L1 based on the Likert scale. The questionnaires ask about the student's satisfaction and attitude toward multimodality. The qualitative analysis was interpreted by measuring the attitudes and satisfaction level, which is the overall significance, gaps, and limitations that might answer question#2.

3.5 Data analysis

The raw pretest and posttest scores were interpreted as results by the SPSS statistics software. After that, comparing the interpreted results might lead to a discussion on the approaches and provide sufficient information to answer the first question. The attitude data was collected by deploying the questionnaire for all participants. The collected data focuses on the student's attitudes to synthesize the results into answering the second question. The students' attitudes were analyzed and interpreted as the students' learning styles that are suitable to find out the appropriate direction of language teaching that might be useful in this century.

3.6 Establishing the reliability and validity of the instruments

The reliability and validity of the instruments were assessed by using the Index of Item-Objective Congruence (IOC) system. Three Thai experts who have been teaching English at the school and university for more than five years were requested to rate the congruence between objectives and items in the test. These ratings were then used to calculate the IOC as follows:

+1 means   a test item is considered congruent with the objectives

 0 means   a test item is considered neutral in terms of whether it is congruent with the object

-1 means   a test item is deemed not congruent with the objective

The IOC (Index of Item-Objective Congruence) is then used to measure the consistency of each item.

$$10C = \frac{\sum R}{N}$$

IOC   means   the index of congruence

R   means   the overall score from the experts

N   means   experts

The reliability of the instruments were measured via a pilot study with 37 grade five students from another private school with the same background. The students in the pilot study have similar characteristics in terms of educational background. The pilot study students have to complete the word segmentation tests and ten questionnaires. The results were analyzed using the Cronbach alpha coefficient; Cronbach's alpha is a measure of internal consistency or reliability, that is, how closely related a set of items are as a group.

3.7 Chapter summary

This chapter explains the methodology of the present study, such as the procedure of making and designing the instruments, including the word selection criteria and data collecting procedure. In the main study, all participants completed two vocabulary tests before 16 hours of orientation multimodal. Following this instruction, the participants completed the two tests

with the attitude questionnaire towards the multimodal teaching approach in the classroom. This study is a quasi-experimental research design using a quantitative method study.
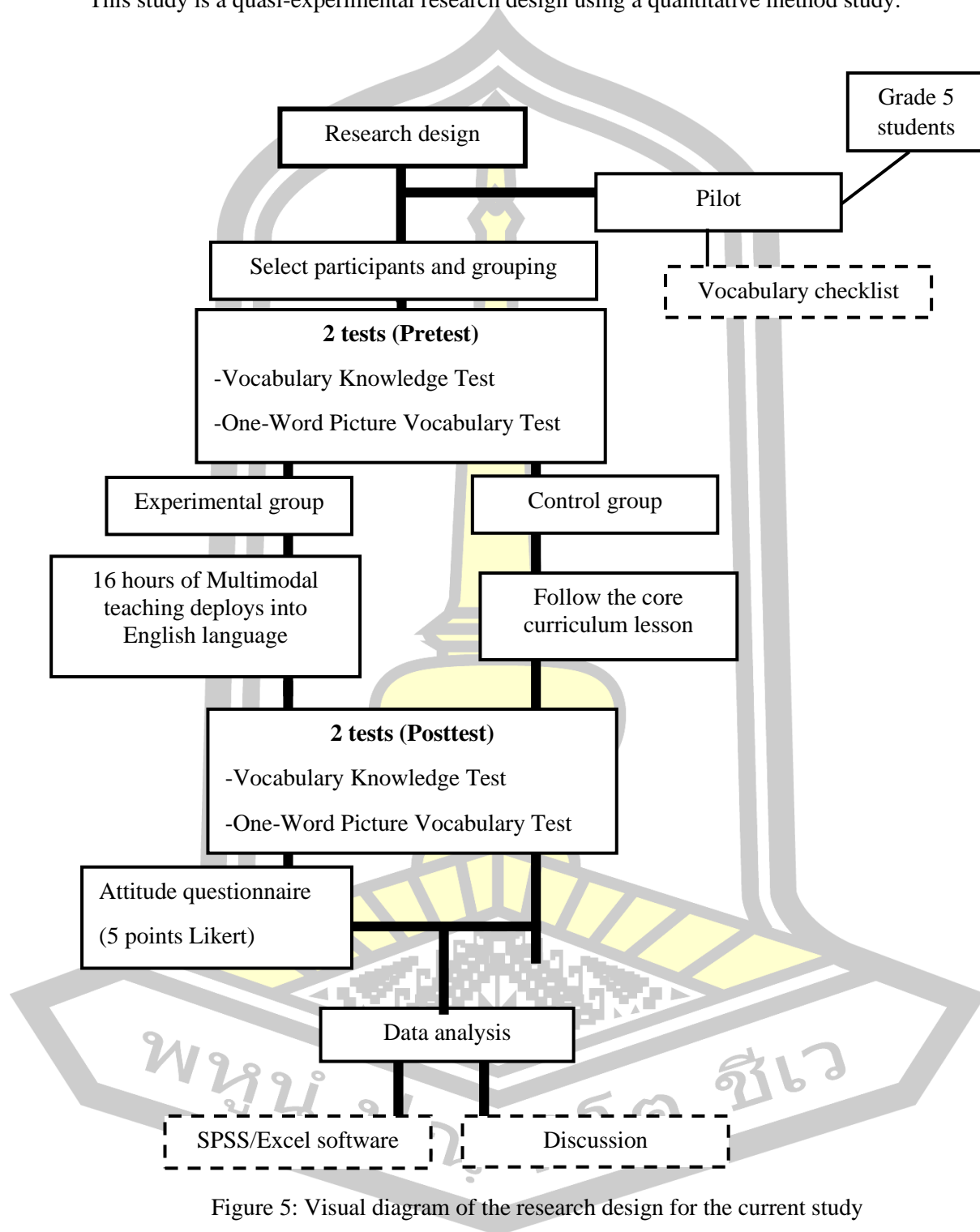

Figure 5: Visual diagram of the research design for the current study

CHAPTER IV
RESEARCH RESULTS

This chapter presents the results of the study. The chapter begins with a general description of the Receptive test results (4.1) and Productive test results (4.2). The following sections will present a summary of the overall quantitative data (4.3), 4.4 Students' attitudes toward multimodal teaching approach (4.4), and other detailed descriptions of each section.

4.1 The effect of multimodal teaching on English vocabulary knowledge of Thai primary school learners

This quasi-experimental study attempted to determine the effect of multimodal teaching on Thai primary school learners' English vocabulary knowledge. The receptive and productive vocabulary knowledge tests were developed and piloted before the main study, and the data were analyzed using descriptive and inferential statistics. The analysis of the results showed that participants scored higher on post-test than pre-test performance.

Receptively, the analysis showed that the experimental group (0.56) had the most considerable effect size, following by the control group (-0.02). Suggesting that the multimodal teaching approach was more effective in teaching vocabulary compared with the control group individually. Therefore, the results designate that no teaching approach was significantly more beneficial than the others in enhancing the participants' receptive vocabulary knowledge. The receptive vocabulary knowledge test (RVKT) assessed participants' receptive knowledge of the form-meaning aspect at the primary level. This test measured the participants' capability to distinguish an L2 meaning in multiple choice by recognizing L1 target words. Table 5 shows the summary of Thai primary school teaching's effects and students' performance on the RVKT. The results show the experimental group reached their performance of 43.33% (S.D. = 4.73) and 55.61% (S.D. = 4.81), and the control group succeeded performance of 46.41 (S.D. = 3.85) for pretest and 47.43% (S.D. = 3.60) on the posttest. A dependent-samples *t*-test specified that posttest scores were significantly higher than pretest scores for participants in the experimental group (*t*-test = 4.73, *p*-value < 0.00) except the control group that the result indicated no significant and

negative of *t*-test (*t*-test = -0.08, p-value < 0.93). The independent *t*-test compare between group with same test shows no significant in receptive pretest and posttest (*t*-test = .1.32 for pretest, 1.06 for posttest. *P*-value = 0.19 for pretest, and 0.29 for posttest).

Table 4: Students' overall performance on the receptive vocabulary knowledge test

Group	Pretest			Posttest			*t*- test	*p*	*d*
	$\bar{x}$	%	S.D.	$\bar{x}$	%	S.D.			
Experimental (n=33)	8.67	43.33	3.83	11.12	55.61	4.81	4.73	0.00	0.56
Control (n=26)	10	46.41	3.85	9.96	47.73	3.60	-0.08	0.93	-0.02
t-test	-1.32			1.06					
p- value	0.19			0.29					

Figure 6 shows the experimental group's performance on form-meaning aspects. The graph revealed that the control group differ in their pre-test performance ($\bar{x}$=2). In contrast, there was a significant difference in the posttest performance of the control group ($\bar{x}$=9.96), and the experimental group ($\bar{x}$=11.12). The experimental group improved their receptive form-meaning skill significantly; the multimodal teaching approach completed their total outstripped the control group significantly. It can be determined that the current study offers evidence that the multimodal teaching approach amended vocabulary learning and development among Thai primary school students in receptive vocabulary knowledge.
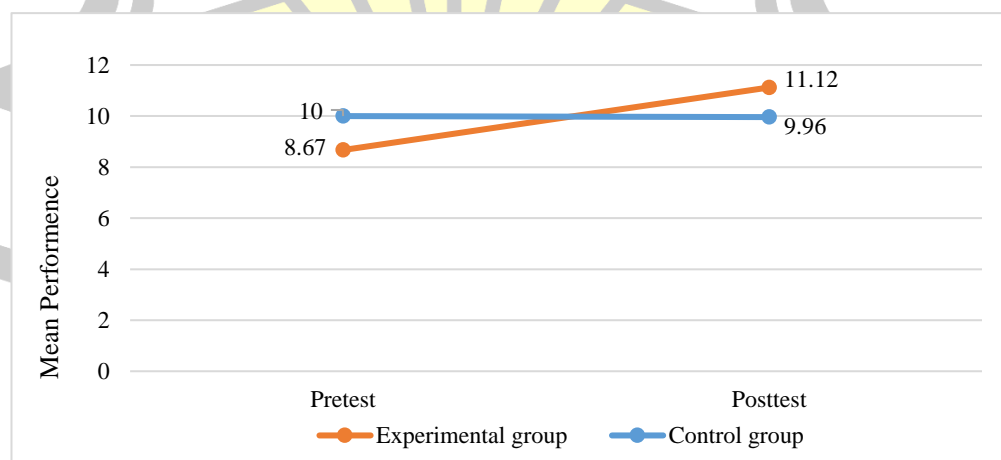

Figure 6: Students' overall performance on receptive vocabulary knowledge

4.2 Productive test results

The productive vocabulary knowledge test evaluated primary school students' productive knowledge of the form-meaning aspect. Specifically, this test assessed the participants' ability to write an L2 vocabulary and L1 meaning of the target word by looking at the picture/video in visual slides. Table 5 summarizes Thai primary school student's performance on the productive test. The experimental group students accomplished an average performance of 22.12% (S.D. = 2.10) on the pretest and 37.12% (SD = 3.47) on the posttest, while the control group reached the performance of 24.83 (S.D. = 1.30) and 30.67% (S.D. = 1.9). A dependent-samples t-test indicated that posttest scores were significantly higher than pretest scores for participants in the experimental group (t-value = 8.29., p-value < 0.00) and the control group (t-value = 2.77, p-value < 0.01). The independent t-test compare between group with same test shows no significant in productive pretest (t-test = -1.72 for pretest, P-value = 0.09 for pretest). By the way, there is significant in the posttest t-test = 2.11 for posttest P-value = 0.04 for posttest. These outcomes indicated a significant rise in the knowledge of productive vocabulary connections over time.

Table 5: Students' overall performance on the productive vocabulary knowledge test

Group	Pretest			Posttest			t-value	p	d
	$\bar{x}$	%	S.D.	$\bar{x}$	%	S.D.			
Experimental (n=33)	4.42	22.12	2.1	7.42	37.12	3.47	8.29	0.00	1.10
Control (n=26)	5.19	24.83	1.3	5.92	30.67	1.9	2.77	0.01	0.45
t-test	-1.72			2.11					
p- value	0.09			0.04					

Figure 7 shows the control group performance ($\bar{x}$= 5.19) and the post-test performance ($\bar{x}$= 5.92), while the experimental group pretest performance ($\bar{x}$= 4.42) was lower than the control group but higher in posttest ($\bar{x}$=7.42). The whole classroom significantly improved their productive vocabulary knowledge focus on form and meaning proficiency; the P5 outperformed the control group. It can be decided that the present study positively affected Thai primary school students' productive vocabulary knowledge.
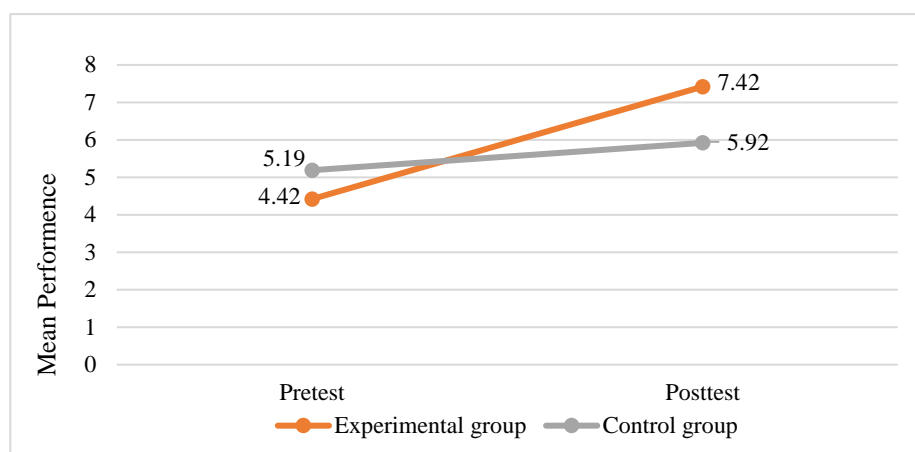
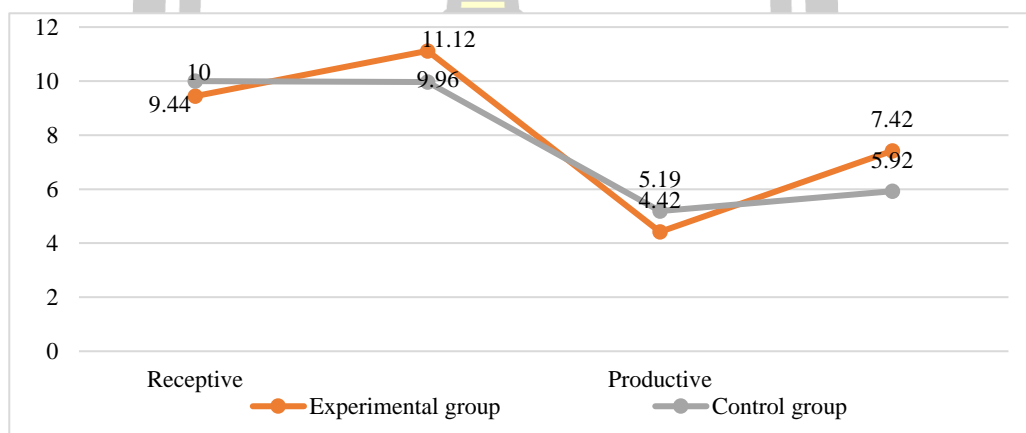Figure 7: Students' overall performance on productive vocabulary knowledge

Figure 8: Summary of the results based on the pretest and posttest performance

4.3 Students' perceptions toward multimodal teaching approach

To answer Research question two, this section investigated Thai primary school learners' attitudes toward multimodal teaching by analyzing the data from the attitude questionnaires administered at the end of this study for the Experimental group. Students were asked to rate a 15-item questionnaire to measure their five attitudinal variables from 'strongly disagree' (1 point), 'disagree' (2 points), 'neutral' (3 points), 'agree' (4 points), and 'strongly agree' (5 points). Table 7 describes the results of the closed-ended statement items in the questionnaires related to the students' attitudes towards the multimodal teaching approach.

Table 6: Student's attitudes questionnaire analysis

No.	Items	Mean	%	S.D.	Meaning
1	I enjoy using multimodal teaching to learn vocabulary	**3.55**	**70.91**	0.86	High
2	I think multimodal teaching assists me in recognizing the meanings of words.	3.91	78.18	0.29	High
3	I think the multimodal teaching guides me in spelling the words.	2.79	55.76	1.20	Medium
4	I think the pictures in multimodal teaching enable me to recall the words.	3.85	76.97	0.89	High
5	I think multimodal teaching is a good way to learn vocabulary.	3.70	73.94	0.94	High
6	I feel motivated to study with multimodal teaching to learn spelling and meaning.	3.91	78.18	0.93	High
7	I feel much better using multimodal teaching to learn spelling and meaning.	3.73	74.55	1.33	High
8	I enjoy learning vocabulary through multimodal teaching from the CANVAs application.	3.73	74.55	1.11	High
9	I think the pictures from multimodal teaching assist me in recalling the words.	3.70	73.94	1.00	High
10	I think multimodal teaching facilitates me in becoming familiar with words.	3.79	75.76	0.81	High
11	I feel that learning vocabulary by categorizing words into themes would help me recognize words faster easily	3.79	75.76	1.04	High
12	Multimodal teaching is appropriate for learning vocabulary at my level.	3.82	76.36	1.00	High
13	I feel comfortable when I learn vocabulary through the multimodal approach.	**4.27**	**85.45**	0.71	High
14	Multimodal teaching helps me to improve my recognition and recall of words.	3.64	72.73	1.20	High
15	The multimodal teaching allows me to learn new vocabulary	**4.27**	**85.45**	0.83	High
Total		**3.76**	**75.20**	**0.94**	**High**

As shown in Table 7, 14 statements had a high mean score between 3.55 - 4.27, and the remaining one had a medium mean score of only 2.79. The overall mean of the attitude questionnaire was 3.72 (S.D. = 0.94). The highest mean score was 4.27, obtained by two statements such as 13 (I feel comfortable when I learn vocabulary by the multimodal approach.) and 15 (Multimodal teaching allows me to learn new vocabulary). This shows that almost the entire class enjoys learning vocabulary using multimodal in the English classroom. This highest score is followed by the score of statement 2 for 3.91 (I think the multimodal teaching assists me in recognizing the meanings of the words.) and statement 6 (I feel motivated when I study with multimodal teaching to learn spelling and meaning.). It showed that students agree that multimodal teaching increased word memorizing, especially sound and meaning,

by using pictures or short videos to emphasize their memorable. According to statement 6, it also stimulates the students by pointing out their spelling problems. Their spelling issue can be represented clearly during exercises session and classroom activities. Statement 4 (I think the pictures in multimodal teaching enable me to recall the words.) was rated 3.85, suggesting that multimodal significantly supported the students to recall and recognize the studied vocabulary.

The lowermost mean score was 2.79, acquired by statement 3 (I think the multimodal teaching guided me to spell the words.) due to the fast pace of the slides and the content that the teacher provided, spelling sessions had been decreased priority in multimodal but connected within the statement 6 that they recognize their issue and process to solve. Moreover, statement 1, which scored 3.55 (I enjoy using multimodal teaching to learn vocabulary), indicates that some students did not enjoy their multimodal learning.

 In summary, the recent discoveries indicate that eight weeks of multimodal teaching improved the students' vocabulary knowledge. Most applicants were satisfied with the contents and activities of the approach, and it helped them learn new vocabulary and enhance their vocabulary knowledge.

4.4 Summary of the chapter

This chapter presented the findings and analyses of Thai primary school learners' test performance. The statistical analyses revealed that the multimodal teaching method improved the participants' vocabulary knowledge receptively and productively. The next chapter will discuss the results with conceptual frameworks underlying the study. It will also discuss the findings with previous studies, whether consistent results exist and how the study's findings contribute to the current body of knowledge in the field.

CHAPTER V
DISCUSSION AND CONCLUSION

The previous chapter suggested the study outcomes and answered the research questions. This chapter further clarified and discoursed the current results in the context of prior studies. Overall, the present study's outcomes revealed a bottomless understanding of the effectiveness and effects of using multimodal teaching in English vocabulary to L2 learners, especially in a Thai EFL context. This chapter discussed the contributions of these findings and proposed the implications for multimodal and recommendations for future studies.

5.1 The effects of multimodal teaching on English vocabulary knowledge among Thai EFL primary school students

The current study investigated the effect of multimodal teaching on the English vocabulary knowledge of Thai primary school learners. Two measures were developed and validated to tap the participants' receptive and productive knowledge of English vocabulary. The analysis of the results showed the significant effects of multimodal teaching on Thai primary school learners. Specifically, primary school participants' vocabulary knowledge measured by two tests significantly increased. From the study, the experimental group increased their word knowledge and gained higher average scores than the control group and higher average scores than their control peers. These findings suggest the benefits of multimodal teaching in enhancing vocabulary learning among Thai primary school students and also align with previous studies of multimodal benefit vocabulary learning processes by using three main learning styles: auditory, visual, and kinesthetic (Kahn and Kellner, 2008; Kress, 2000; Jewitt, 2008; Yimwilai and Phusri, 2018).

The students' significant increase in vocabulary knowledge through multimodal teaching is the outcome of the effectiveness of deliberate vocabulary learning. Intentional vocabulary learning speeds up learners' vocabulary development process due to visual aids to assist short-term memory into long-term memory. These strategies can be completed individually in a short time. The result also argues that multimodal teaching through interactive multimedia presentations, songs, and online resources has been found to improve students' motivation, engagement, and retention

of new vocabulary words. The findings align with previous studies that using different learning modes promotes vocabulary acquisition (Chen & Chang, 2013; Huang, Huang, & Huang, 2018; Magnussen & Sukying, 2021; Sukying & Yowaboot, 2022). These propose that cautious attempted to learn vocabulary are effective and worthwhile.

Besides, Schmidt's (2010) Noticing Hypothesis indicated the necessary condition for L2 vocabulary learning. As applied to vocabulary learning by multimodal teaching, primary school participants must consciously see L2 features or characteristics of the target words in the input activities and pay deliberate attention to form-meaning links of lexical items to optimize their learning. For these explanations, vocabulary is commonly taught clearly in foreign language classrooms to compensate for the limited exposure and resources that may otherwise be available. These findings align with previous studies that multiple modes (e.g., songs, visuals, word cards, and digital flashcards) are effective (Magnussen & Sukying, 2021; Nation, 2011; Patthong & Panjaburee 2019 Yowaboot & Sukying, 2021). The improvement in vocabulary knowledge of the target words could be explained by the deliberate learning of vocabulary input that allows learners to practice the target words using multimodal teaching. In this concern, the focused conscious vocabulary learning through the multimodal facilitate students better remember and recall L2 vocabulary.

The Noticing Hypothesis posits that second language learners need to consciously notice features of the target language to acquire them. This means language learning involves active engagement with the language and attention to its features. Schmidt (2001) noted that noticing is an initial stage for L2 vocabulary learning. In the current study, learners consciously see salient features of the word and pay attention to the form-meaning link of it through multimodal teaching strategies. That is, animated images integrated into classroom activities help students notice a word and retrieve its meaning, which promotes word acquisition. The audio input with the animated pictures boosts the learners' memorization through a lyric and tone of the word. These findings support the claim that audio-visual aids promote L2 vocabulary acquisition and expansion (Magnussen & Sukying, 2021; Yowaboot & Sukying, 2022). In this regard, the multimodal approach advocated using multiple modes of representation,

such as text, images, sound, and movement, to engage learners and facilitate learning. This approach recognizes that learners have different learning styles and preferences and that using multiple modes of representation can help to address these differences and provide multiple pathways to understanding. In conclusion, the Noticing Hypothesis, Constructivism Theory, and Multimodal Approaches aim to facilitate effective language learning through engagement and interaction.

The increased vocabulary knowledge can be due to cognitive processes: noticing and retrieval. Seeing the lexical item leads to learning a novel word in a language classroom. As such, retrieval reinforces the word's meaning in a learner's mind. For example, it is easily noticed when students have presented a word through multiple modes of teaching platforms. Accordingly, it is likely to be learned. That is, the more frequently a lexical item is retrieved during a learning process, the more likely the target word will become deeply embedded in the learner's memory. Indeed, these new encounters force learners to reconsider their understanding of such words. When the students received multimodal teaching in the classroom and advanced vocabulary knowledge, this phenomenon helped students establish the memory of this word. On vocabulary tests, the multimodal classroom outperformed the incidental group significantly in digital flashcards, songs, and previous studies of multimodal (Harchegani & Sherwan, 2021; Panyasorn & Suksakulchai, 2018; Magnussen & Sukying, 2021; Yowaboot & Sukying, 2022; Tabrizi & Feiz, 2016; Yimwilai & Phusri, 2018). Deliberate efforts to learn vocabulary are effective and worthwhile (Nation & Meara, 2010). These discoveries are consistent with previous research indicating that duplication and reclamation of the L2 word extend its meaning or definition and that repeated exposure to and use of it leads to the learner better understanding each sense of the word encountered by the students (Elgort, 2011; Elgort & Nation, 2010; Hung, 2017; Hustijn, 2003; Kerdmuenwai, 2018; Magnussen & Sukying, 2021; Nation, 2013; Nation & Meara, 2010; Vidal, 2011; Waring & Donkaewbua, 2008; Yowaboot & Sukying, 2022). In short, the current study supports the effectiveness of multimodal for vocabulary learning and teaching.

The constructivism theory could explain the significant gains in vocabulary knowledge among Thai primary school students. Multimodal teaching techniques

used in this study promote learning by constructing knowledge and understanding of new vocabulary. The theory suggests that learners build their understanding through experiences and interactions with the environment, and they use prior knowledge and experiences to help make sense of new information (Abdal-Haqq, 1998; Duffy, 2006; Hein, 2007; Mogashoa, 2014). The relationship between multimodal teaching and constructivism theory can be seen in the way that multimodal teaching supports the active construction of knowledge through the use of multiple modes of representation and interaction. By providing learners with various ways of engaging with information, multimodal teaching can help to support the process of constructing meaning and understanding.

Additionally, by incorporating hands-on and interactive experiences, multimodal teaching can provide opportunities for learners to actively engage with and create their knowledge, which aligns with the principles of constructivism (Hein, 2007; Mogashoa, 2014). In brief, multimodal teaching and constructivism theory are compatible and complementary approaches to education that support the active construction of knowledge by the learner. Using multiple modes of representation and interaction, multimodal teaching can help support the learning process described by constructivism theory.

Multimodal teaching can be effectively merged with constructivism theory in English language learning by creating learning environments that support the active construction of knowledge. This can be achieved by incorporating multiple modes of representation and interaction, including visual, auditory, and kinesthetic, into the teaching process. According to Li (2022), teachers can use various teaching methods, such as role-playing, games, songs, videos, and discussions, to provide students with multiple ways of engaging with the language and each other. This helps keep students interested and motivated and allows them to build their understanding of the language by actively constructing their knowledge (Cárcamo et al., 2016; Fajardo & Pintado, 2021; Lan et al., 2018).

In addition, constructivism theory emphasizes the importance of allowing students to work with and manipulate language in real-life situations (Cole, 1996). This can be accomplished through pair work, group work, and projects using English in context.

These types of activities not only help students to internalize the language but also allow them to build their understanding of the language through their own experiences. Another explanation is that the principles of constructivism can be integrated into assessment practices by providing students with opportunities to reflect on their learning, engage in self-assessment, and set their own learning goals (Bodner, 1986). This type of assessment not only supports the active construction of knowledge but also helps students to develop a deeper understanding of the language and to take greater ownership of their learning.

The multimodal teaching approach can be merged with constructivism theory in English language learning. For instance, role-playing activities allow students to practice using English in real-life situations. Students could role-play a job interview or a conversation between friends. This activity helps students develop their language skills and supports their active construction of knowledge as they engage with the language meaningfully. In addition, using games can effectively engage students and provide them with multiple ways of engaging with the language. Indeed, word games, language puzzles, and memory games help students build their vocabulary, grammar, and comprehension skills (Pornrattanacharoen & Vongurai, 2017). This activity allows students to internalize the language through play and develop their understanding of the language in a fun and interactive way (Chomchaiya & Intaraprasert, 2019; Panyasorn & Suksakulchai, 2018; Pornrattanacharoen & Vongurai, 2017; Sakulprasertsri, 2020).

Using songs as another teaching mode provides students with an engaging and memorable way of learning vocabulary, grammar, and pronunciation. For example, teachers can use English songs to teach students new vocabulary words or use songs to help students practice their pronunciation and intonation. This activity allows students to build their language skills and supports the active construction of knowledge as they engage with the language through music. Likewise, videos can provide students with visual and auditory representations of the language, which can help to support their active construction of knowledge (Magnussen & Sukying, 2021). For example, teachers can use videos to introduce new vocabulary, grammar structures, or cultural concepts. This type of activity not only helps students to

internalize the language but also allows them to engage with the language in a meaningful and memorable way. Together, by merging the multimodal teaching approach with constructivism theory, English language teachers can create learning environments that are engaging, effective, and supportive of their students' active construction of knowledge (Hung, 2015; Magnussen & Sukying, 2021; Nation, 2011; Yowaboot & Sukying, 2022).

In conclusion, the use of multimodal teaching has been found to have a beneficial effect on vocabulary improvement among Thai primary school learners. Several studies have investigated the use of multimodal teaching in the Thai context and have found that it can significantly improve students' vocabulary acquisition.

5.2 Thai EFL primary school students' attitude towards using multimodal teaching

In response to Research Question 2, the quantitative data were derived from the questionnaire given to the participants from the experimental group to explore their attitudes toward using multimodal teaching to improve vocabulary knowledge. The study used the five-point Likert scale questionnaires to indicate that, on average, primary school students are delighted with multimodal teaching. The current findings showed positive attitudes towards deliberate vocabulary learning through multimodal due to communication features, a wide range of techniques to apply, and convenience to use or change according to the current context. Multimodal teaching is semi-contextualizing. Multimodal learning increases effectiveness in a short period and can provide vocabulary knowledge to learners through retrieval on reviewing lessons or usage in activities or completing their assignments. However, the teacher tries to decrease boredom and focus on word acquisition. The students feel their spelling practice is less than core-curriculum teaching. The current findings are consistent with previous studies that multimodal aids learners to focus on form and meaning simultaneously for constant retrieval of vocabulary items (Dizon & Tang, 2017; Magnussen & Sukying, 2021; Yuksel et al., 2020; Wilkinson, 2017; Yowaboot & Sukying, 2021). The benefits of multimodal teaching in rushing deliberate vocabulary learning among Thai primary school students could be because of their usefulness, broad scope & context, and entertainment value. It includes visual images and sounds,

which could motivate students to learn the meaning and spelling of individual words. In addition, it could assist students in memorizing and recalling vocabulary items more effectively. To conclude, the current findings offer provision to the existing literature that multimodal teaching is an effective tool for thoughtful vocabulary learning (Chomchaiya & Intarapraert, 2019; Kahn and Kellner, 2008; Kayumova & Sadykova, 2019; Kress, 2000; Jewitt, 2008; Lan et al., 2018; Pintado & Fajardo, 2021; Pornrattanacharoen and Vongurai, 2017; Sakulprasertsri, 2020; Yimwilai and Phusri, 2018).

5.3 Conclusion of the study

The current study yielded some fruitful information for L2 vocabulary acquisition and development. Indeed, the study pointed out that multimodal teaching techniques benefited vocabulary learning among Thai EFL primary school learners. The study also indicated that the use of multiple modes of teaching strategies facilitated Thai primary school learners' vocabulary acquisition and development. Moreover, the current findings also showed that Thai primary school students had a high attitude towards using multimodal teaching methods; that is, they perceived those multimodal modes of teaching engaged and benefited their vocabulary acquisition and development. Overall, the multimodal teaching method is effective for L2 vocabulary acquisition and allows teachers to engage students in learning new vocabulary.

5.4 Implications of the study

This study yielded several important implications. First, since vocabulary is a crucial element of language learning, practitioners require to equip themselves with up-to-date technological instructive approaches. Specifically, the results can oblige language teachers at all education levels. The present study could also benefit practitioners with foreign language teachings, such as curriculum planners, material creators, and test developers. Furthermore, the recent findings are also appropriate to learning language skills and sub-skills, including listening, speaking, pronunciation, vocabulary, and cooperating skills. Specifically, this study proved multimodal's effectiveness in facilitating vocabulary learning and teaching.

**5.5 Limitations of the study**

Due to the wide range of techniques, certain limitations are imposed on the current research. First, the preparation session of the multimodal lessons is pointless to initiate because the ready-made classroom materials can be adapted to provide content in language learning anytime. Therefore, the preparation stage could be created by considering the school's and students' context. The impact of the first limitation causes less time to develop and refine strategy effectively. Second, the duration in the classroom is shorter than the core-curriculum teaching due to the explanation of each slide, classroom activities, and setting classroom before initiating that can be absorbed more than twenty minutes per class.

5.6 Suggestions for further studies

Multimodal teaching and constructivism theory are both concerned with the active construction of knowledge by the learner. Both approaches emphasize the importance of incorporating multiple modes of representation and interaction in the learning process. Besides, multimodal teaching is an instructional approach that recognizes the importance of using various presentation methods to support learning, including visual, auditory, and kinesthetic. This approach acknowledges that different learners may have different strengths and preferences for learning and that by incorporating multiple modes of representation, teachers can help learning for a broader range of learners. Future studies may benefit multimodal pedagogical practices by examining the different aspects of vocabulary knowledge and other language skills. Further studies may call for the need to reorient the teaching and learning of L2 vocabulary and EFL, focusing on multimodal pedagogical practices. Thus, this study emphasize previous studies that support the use of constructivism theory and multimodal teaching for EFL learners. There are some examples of explicit evidence:

Alqahtani (2015) conducted research on the use of multimedia technology to improve the listening comprehension of EFL learners. He discovered that using multimedia resources, such as videos, audio recordings, and interactive activities, assisted students in better understanding and remembering new vocabulary and concepts. Gao and Zhang (2018) investigated the impact of multimodal teaching on EFL learners' reading comprehension. They discovered that using a variety of multimodal resources,

such as videos, images, and audio recordings, improved learners' understanding and retention of new vocabulary and concepts. Kiliçkaya and Krajka (2017) investigated the effects of a constructivist approach on the writing performance of EFL learners. They discovered that using a constructivist approach, which emphasized learner autonomy and collaborative learning, resulted in better writing skills and higher learner motivation. Hsieh (2019) investigated the effect of a constructivist approach on the speaking proficiency of EFL learners. He discovered that by giving students opportunities to participate in interactive and collaborative activities, they were able to improve their speaking skills and confidence.
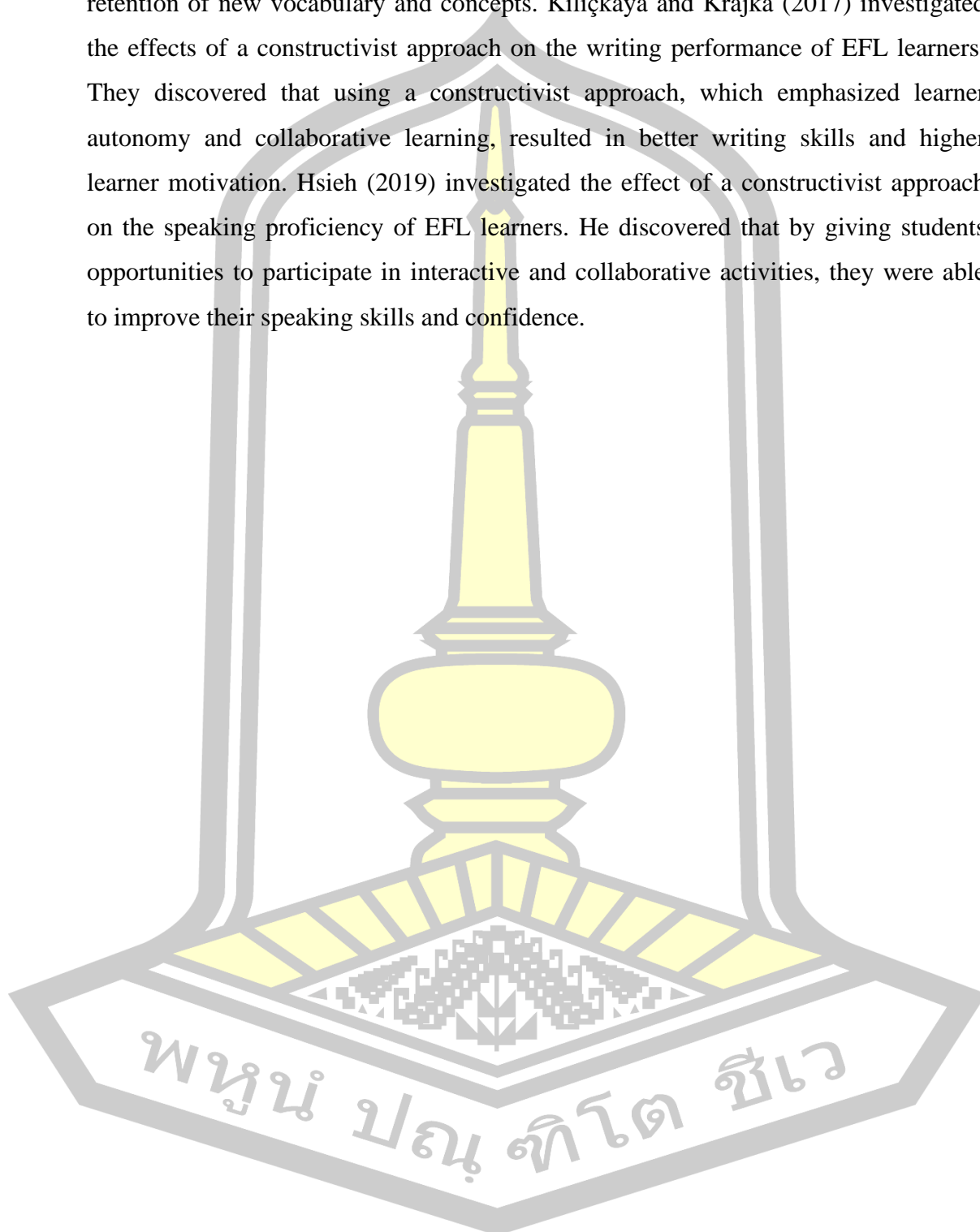
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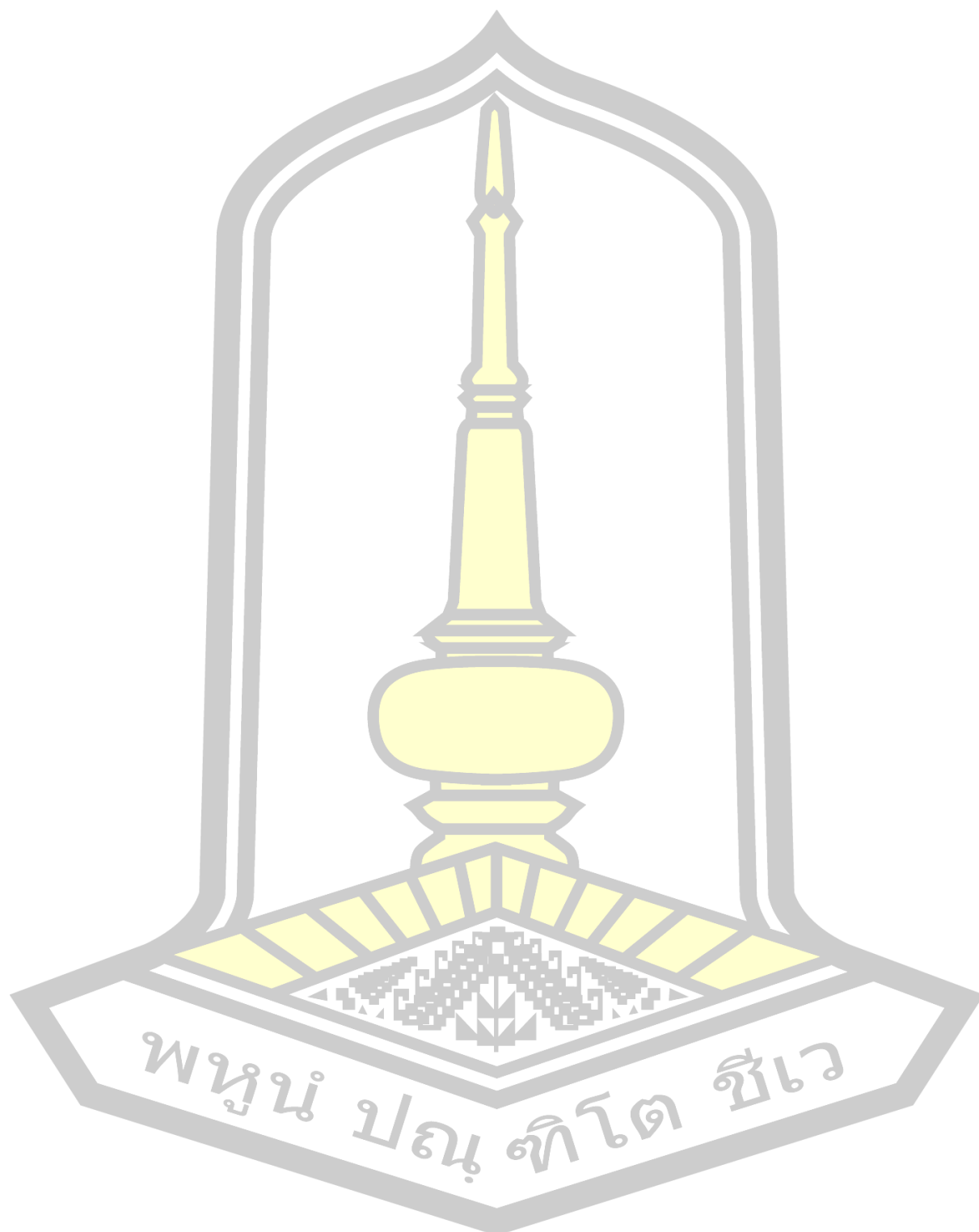
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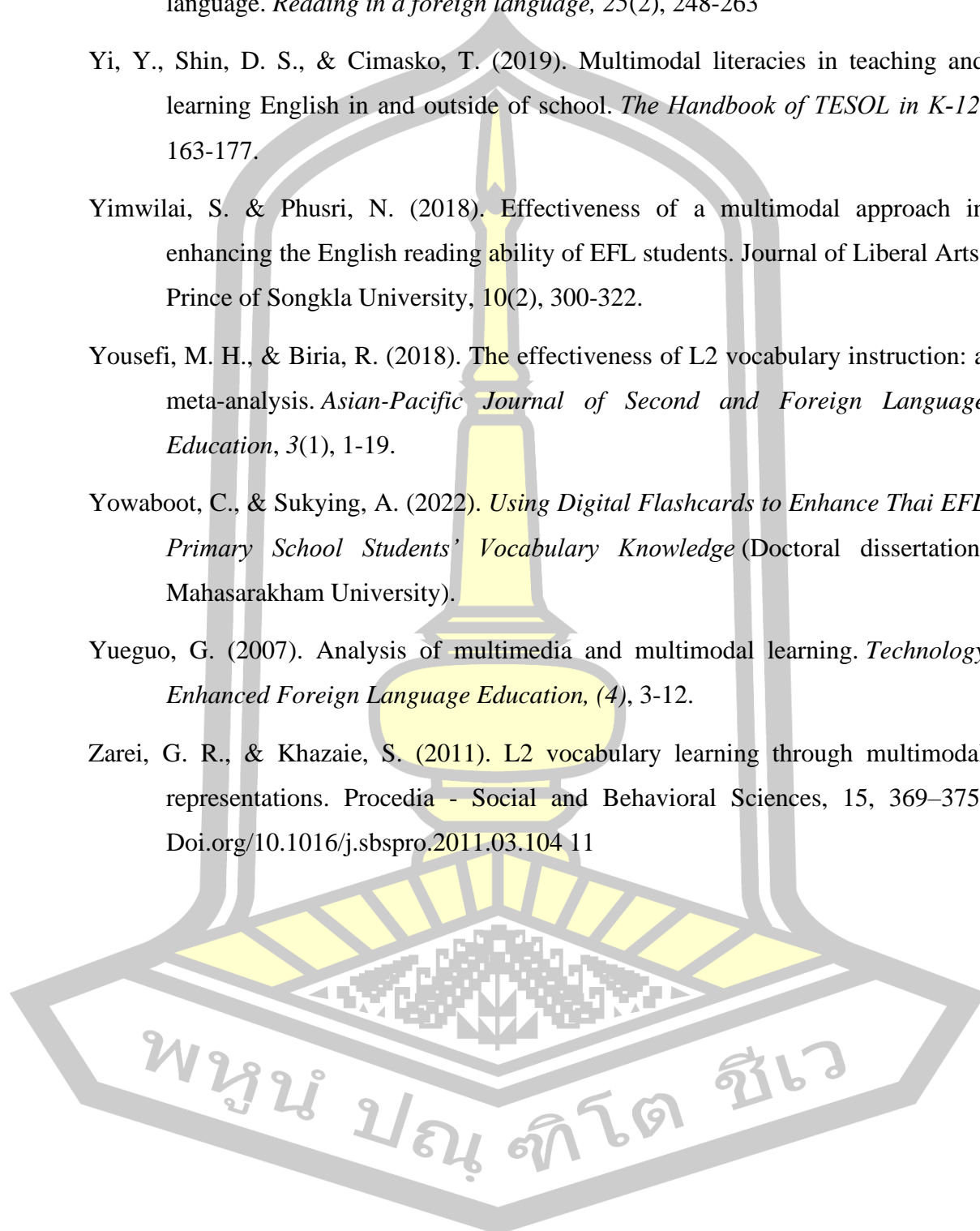
APPENDICES
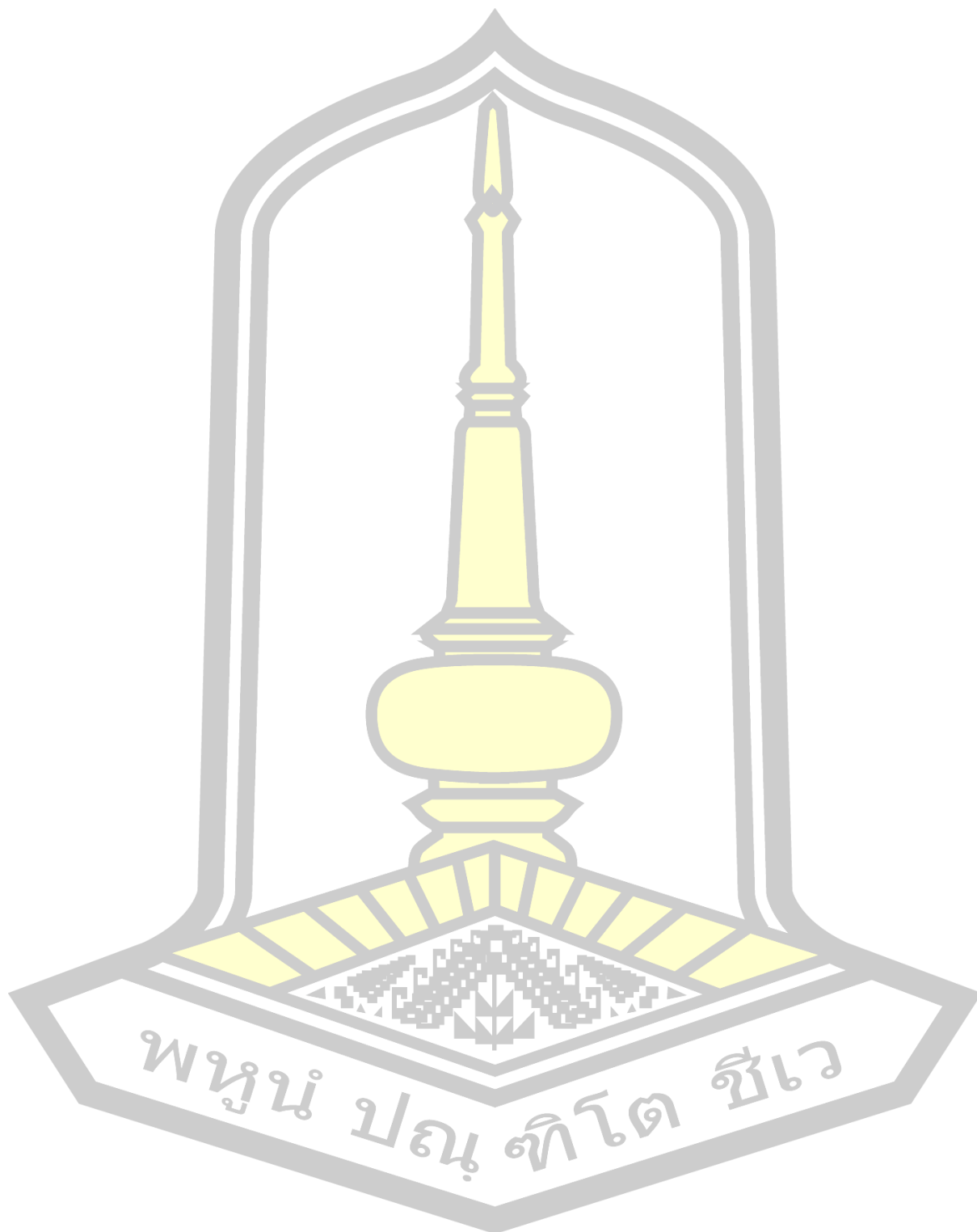
Appendix A: Vocabulary Checklist Test

Instructions: เติมเครื่องหมาย ✓ ที่ช่อง" Know" และเขียนความหมายของคำศัพท์ที่ช่อง "Meaning" ถ้า นักเรียนรู้จักคำศัพท์ที่กำหนดให้ เติมเครื่องหมาย **X** ลงในช่อง" Unknown" หากนักเรียนไม่ทราบหรือไม่รู้จัก คำศัพท์นั้น.

Vocabulary	Know	Unknown	Meaning
Above			
Answer			
Art			
Actor			
Africa			
Autumn			
Belt			
Beef			
Brush			
Bread			
Butter			
Behind			
Below			
Burn			
Cake			
Camera			
Close			
Cook			
Climb			
Cross			
Cover			
Dawn			
Dish			
Drink			
Drop			
Dice			
Dead			
Donkey			
Easy			
Egg			
Elbow			
Energy			
Electric			
Elder			
Eraser			
Fast			
Face			
Few			
Fat			
Fire			
Fever			
Force			

Vocabulary	Know	Unknown	Meaning
Flower			
Garden			
Guide			
Gift			
Gold			
Giraffe			
Germany			
Hate			
Heat			
Hole			
High			
Hour			
Horse			
Ice			
Idea			
Jaw			
Jacket			
Jump			
King			
Kitten			
Key			
Know			
Knife			
Kitchen			
Listen			
Lose			
Lemon			
Light			
Low			
Long			
Like			
Moon			
Mask			
Meat			
Music			
Much			
Many			
Noodle			
Nose			
Nurse			
North			
Need			
Never			
Orange			
Olive			
Oil			
Plus			
Price			
Pumpkin			

Vocabulary	Know	Unknown	Meaning
Pick			
Put			
Quiet			
Quite			
Quick			
Rain			
Read			
Right			
Rice			
Ride			
Small			
Smell			
Scale			
Snow			
Slow			
Smile			
Sing			
Summer			
Seasons			
Tale			
Table			
Touch			
Take			
Tell			
Tea			
Uncle			
Umbrella			
Under			
Voice			
Vocabulary			
Vegetables			
Wish			
Watch			
Want			
Wallet			
West			
Winter			
Write			

Appendix B: Vocabulary Knowledge Test (20 Item)

1. จงหาคำแปลที่ถูกต้องของคำว่า "หิมะ"/ Find the correct translation of the word
    - ก. Snew
    - ข. Snow
    - ค. Snuw
    - ง. Snaw

2. จงหาคำแปลที่ถูกต้องของคำว่า "เผาไหม้"/ Find the correct translation of the word
    - ก. Born
    - ข. Brunt
    - ค. Burn
    - ง. Bern

3. จงหาคำแปลที่ถูกต้องของคำว่า "ข้างบน"/ Find the correct translation of the word
    - ก. Above
    - ข. Below
    - ค. Abevo
    - ง. Abeve

4. จงหาคำแปลที่ถูกต้องของคำว่า "เกลียด"/ Find the correct translation of the word
    - ก. Hour
    - ข. Hole
    - ค. Heat
    - ง. Hate

5. จงหาคำแปลที่ถูกต้องของคำว่า "ต้องการ"/ Find the correct translation of the word
    - ก. Need
    - ข. Note
    - ค. Wish
    - ง. Want

6. จงหาคำแปลที่ถูกต้องของคำว่า "ปรารถนา"/ Find the correct translation of the word
    - ก. Note
    - ข. Wish
    - ค. Need
    - ง. Want

7. จงหาคำแปลที่ถูกต้องของคำว่า "ง่าย"/ Find the correct translation of the word
   - ก. Eraser
   - ข. Easy
   - ค. Esay
   - ง. Easey

8. จงหาคำแปลที่ถูกต้องของคำว่า "ลูกเต๋า"/ Find the correct translation of the word
   - ก. Drive
   - ข. Dige
   - ค. Dice
   - ง. Dizz

9. จงหาคำแปลที่ถูกต้องของคำว่า "ปีนป่าย"/ Find the correct translation of the word
   - ก. Climd
   - ข. Crew
   - ค. Crawl
   - ง. Climb

10. จงหาคำแปลที่ถูกต้องของคำว่า "ขนาด"/ Find the correct translation of the word
   - ก. Scale
   - ข. Smell
   - ค. Small
   - ง. Smile

11. จงหาคำแปลที่ถูกต้องของคำว่า "ปกคลุม"/ Find the correct translation of the word
   - ก. Cever
   - ข. Caver
   - ค. Covar
   - ง. Cover

12. จงหาคำแปลที่ถูกต้องของคำว่า "ปิด"/ Find the correct translation of the word
   - ก. Clotse
   - ข. Clost
   - ค. Close
   - ง. Cloze

13. จงหาคำแปลที่ถูกต้องของคำว่า "ทิศเหนือ"/ Find the correct translation of the word

 ก. North

 ข. Notrh

 ค. Norts

 ง. Knots

14. จงหาคำแปลที่ถูกต้องของคำว่า "ฤดูหนาว"/ Find the correct translation of the word

 ก. Winner

 ข. Winfer

 ค. Winter

 ง. Wintter

15. จงหาคำแปลที่ถูกต้องของคำว่า "ฤดู"/ Find the correct translation of the word

 ก. Seasens

 ข. Seasuns

 ค. Seesons

 ง. Seasons

16. จงหาคำแปลที่ถูกต้องของคำว่า "อ่าน"/ Find the correct translation of the word

 ก. Reef

 ข. Reed

 ค. Read

 ง. Raed

17. จงหาคำแปลที่ถูกต้องของคำว่า "เขียน"/ Find the correct translation of the word

 ก. Rites

 ข. Write

 ค. Right

 ง. Wright

18. จงหาคำแปลที่ถูกต้องของคำว่า "สูง"/ Find the correct translation of the word

 ก. High

 ข. Hike

 ค. Hight

 ง. Hide

19. จงหาคำแปลที่ถูกต้องของคำว่า "ต่ำ"/ Find the correct translation of the word
    ก.   Under

    ข.   Below

    ค.   Low

    ง.   Behind

20. จงหาคำแปลที่ถูกต้องของคำว่า "ยีราฟ"/ Find the correct translation of the word
    ก.   Giraff

    ข.   Girafy

    ค.   Giraffe

    ง.   Girafy
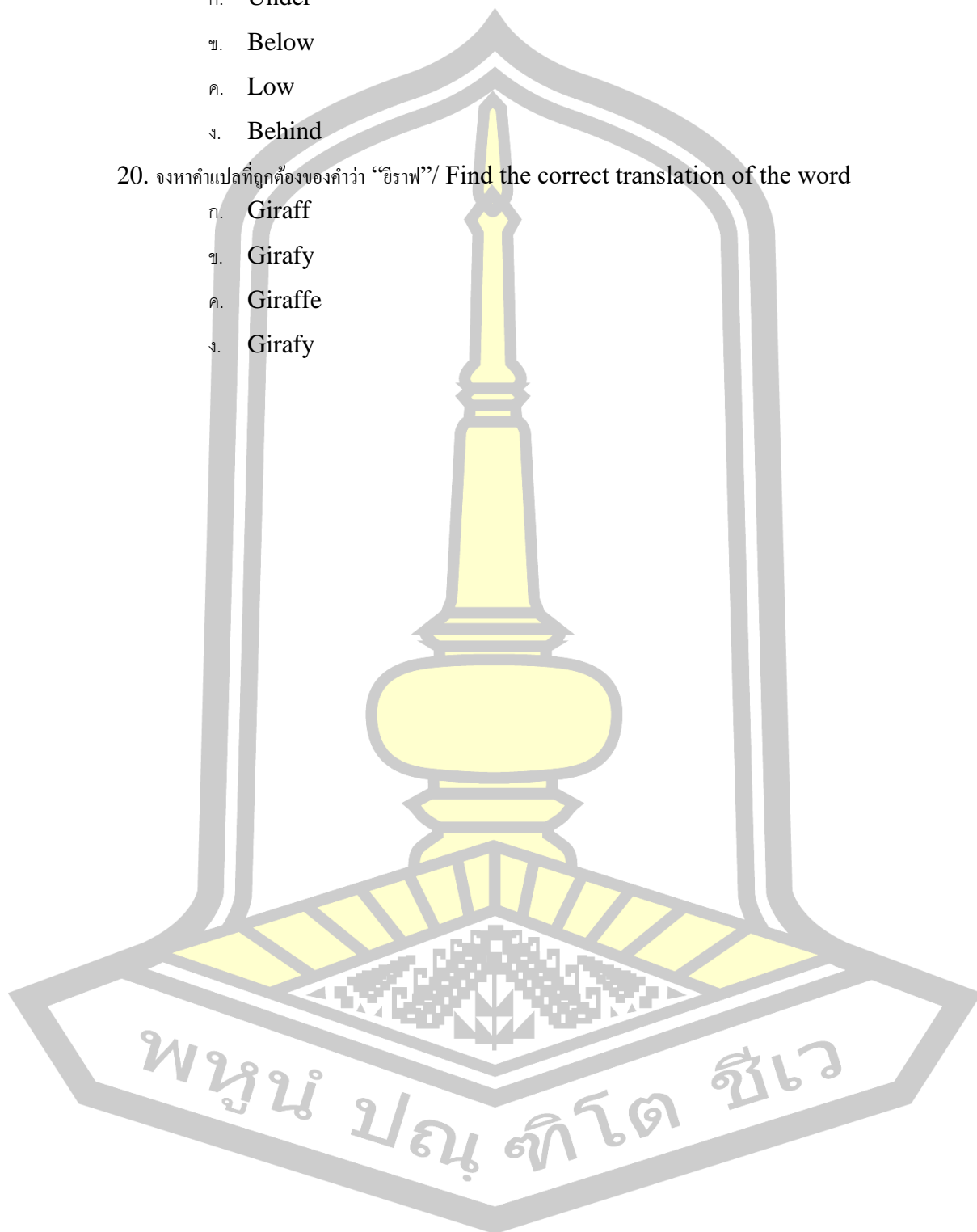
Appendix C: One–Word Picture Test

Write the meaning of the picture given in English words.

Answers:

Actor นักแสดง/ดารา, Beef เนื้อโค, Butter เนยม Cross ข้าม/กากบาท/กางเขนม Dawn รุ่งเช้า, Donkey ลา,

Elder ผู้สูงอายุ/ผู้อาวุโส, Eraser ยางลบ, A few มีน้อย/มีไม่มาก, Guide ไกด์/มัคคุเทศก์/แนะนำ, Heat ความร้อน,

Hole หลุม/บ่อ, Kitchen ห้องครัว, Much มาก, Many มาก, Olive มะกอก, Quick/Fast รวดเร็ว,

Tale นิทาน/เรื่องเทพนิยาย, Touch แตะ/สัมผัส, Wallet กระเป๋าสตางค์

_ _ _ _
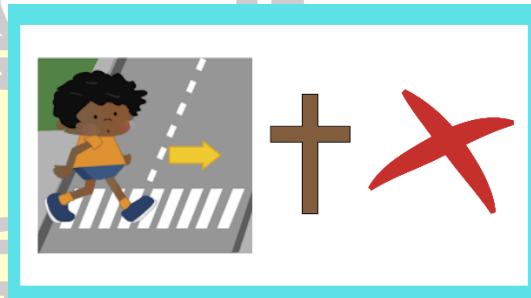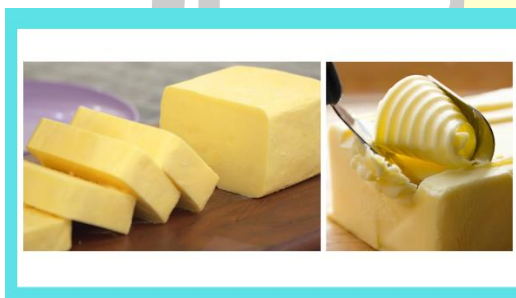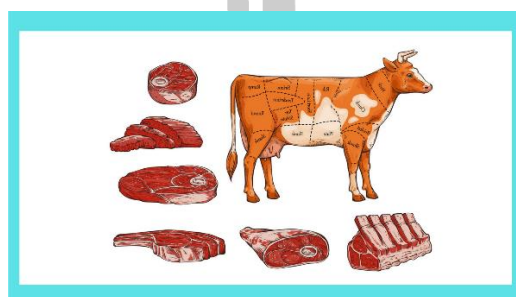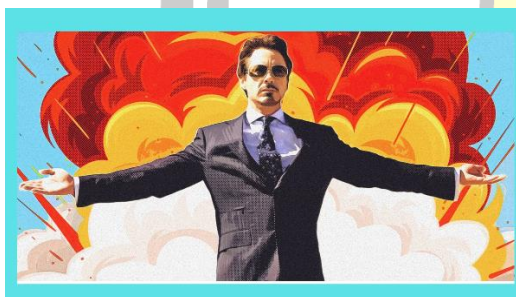
A lot

อาชีพในวงกลมสีแดงคืออะไร

ในวงกลมสีแดงคืออะไร

กระสอบละ 149 บาทครับ

เท่าไรคะ

ข้าวสาร//ข้าวเปลือก

HINT: ราคา/คำนามนับไม่ได้

12 eggs = 1 dozen

HINT: จำนวน/คำนามนับได้
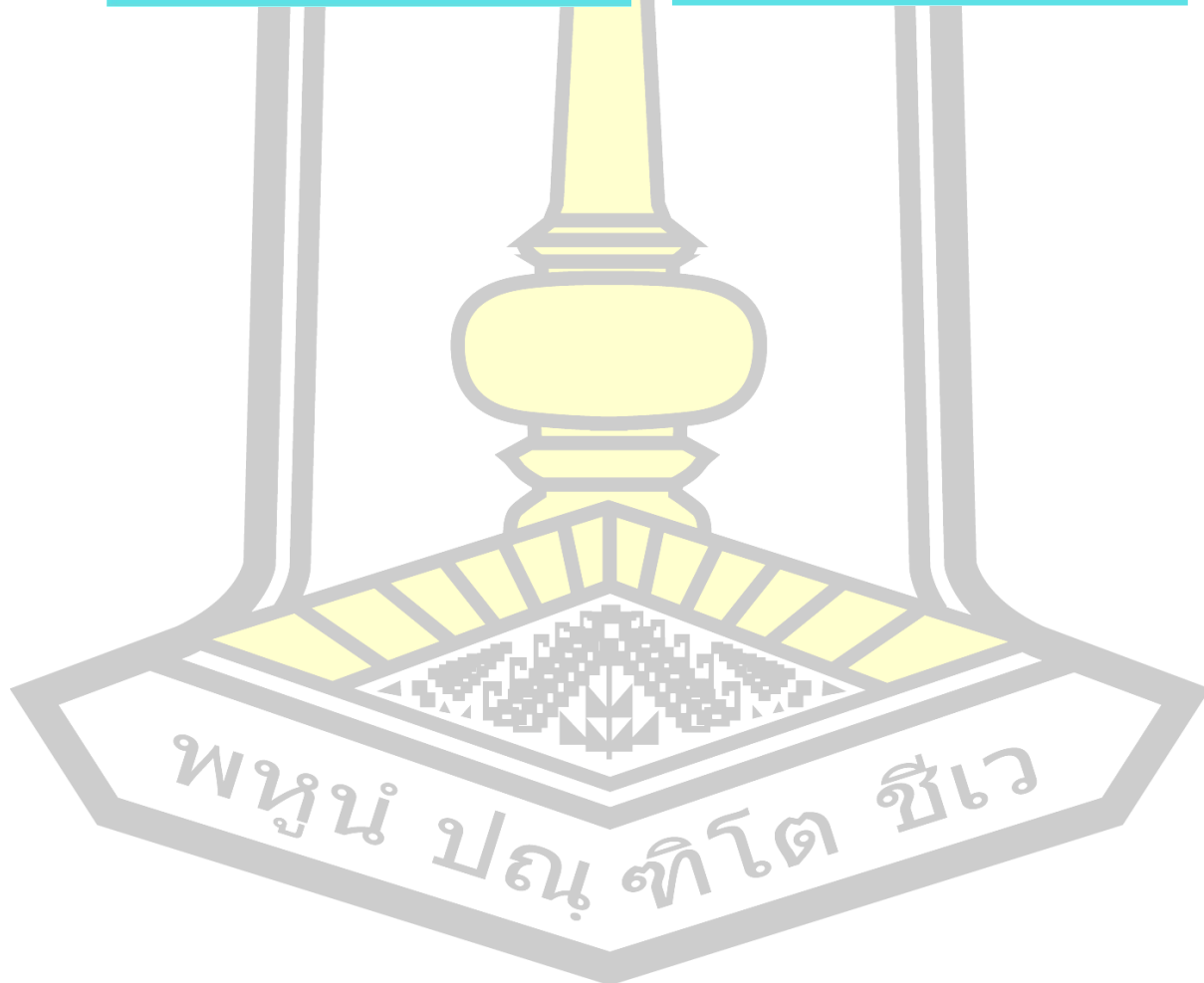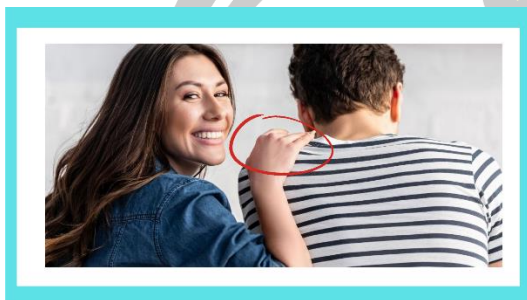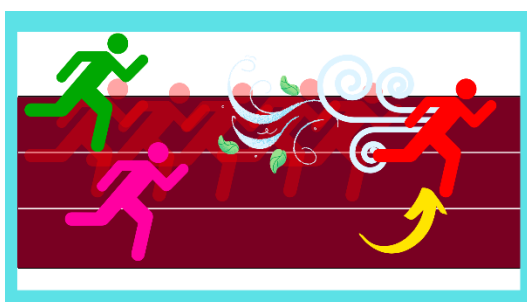
Appendix D: Attitude Questionnaire

Purposes:

1. The attitude questionnaire aims to discover students' attitudes towards using multimodal approach on vocabulary learning.

2. The questionnaire consists of 2 parts: personal information and questionnaire on using multimodal approach.

3. The collected information will be benefit for developing classroom procedures, and there are unaffected the students' grades.

4. The information will be only used for research purposes and potential publications all participants will be anonymous and confidential.

5. The attitude questionnaire will be translated into L1 when distributed to the students.
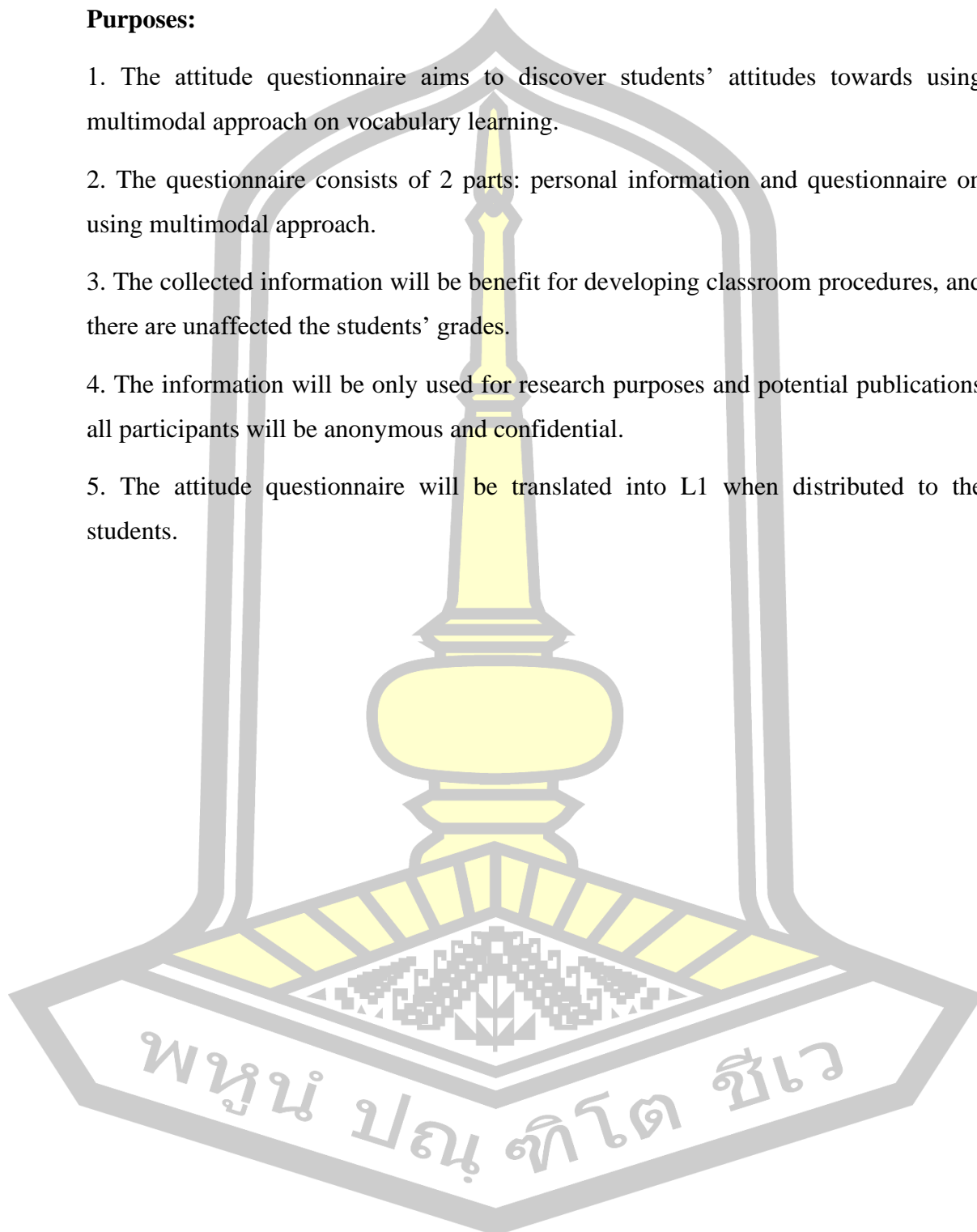
Part 1: Personal Information

Directions: Answer the following questions about your personal information by putting the ✓ in the bracket before filling in the information.

1. Gender ( ) Male ( ) Female

Part 2: Students' attitudes towards the multimodal approach

	Items	Score level				
		5	4	3	2	1
1	I enjoy using the multimodal approach to learn vocabulary					
2	I think the multimodal approach assist me in recognizing the meanings of the words.					
3	I think the multimodal approach guide me to spell the words.					
4	I think the pictures in multimodal approach enable me in recalling the words.					
5	I think multimodal approach is a good way in learning vocabulary.					
6	I feel motivated when I study with multimodal approach to learn spelling and meaning.					
7	I feel much better when I use multimodal approach to learn spelling and meaning.					
8	I enjoy learning vocabulary through multimodal approach from CANVAs application.					
9	I think the pictures from multimodal approach assist me to recall the words.					
10	I think multimodal approach facilitate me in becoming familiar with words.					
11	I feel that learning vocabulary by categorizing words into themes would help me recognize words faster easily					
12	The multimodal approach are appropriate for learning vocabulary at my level.					
13	I feel comfortable when I learn vocabulary by the multimodal approach.					
14	The multimodal approach help me to improve my recognition and recall of words.					
15	The multimodal approach allow me to learn new vocabulary					

Directions: Please answer by checking (✓) sincerely according to your opinions

5 = Strongly agree 4 = Agree 3 = Neutral 2 = Disagree 1 = Strongly disagree

Appendix E: Visual Aids slides

ABOVE(PREP.)(ADJ.)(ADV.)
อะบัฟ
ข้างบน/ด้านบน/บน/อยู่เหนือพื้น/อยู่เหนือศีรษะ
(คำบุพบท)(คำคุณศัพท์)(คำกริยาวิเศษณ์)

ยูเอฟโอสองลำบินอยู่**ด้านบน**ของเมือง
Two UFOs fly **above** a city.

AUTUMN(N.)
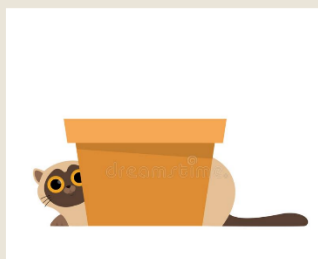ออร์ทึมนฺ
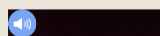ฤดูใบไม้ร่วง(คำนาม)

ART(N.)
อาร์ตทฺ
ศิลปะ(คำนาม)

BEEF(N.)
บีฟฟฺ
เนื้อโค(คำนาม)

BEHIND(ADV.PREP.)
บิ ไฮดุ
ด้านหลัง
(คำวิเศษณ์คำบุพบท)

A cat   is **behind**   a pot.
แมวหนึ่งตัวอยู่ด้านหลังกระถาง

BELOW(ADV., PREP)
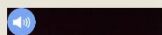เบะ โล
ด้านล่าง(บุพบท, วิเศษณ์)
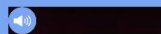
BLOW   (V.)
โบลว
เป่า/พ่น/พัด
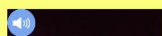(คำกริยา)

BREAD(N)
เบรดดุ
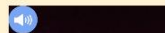ขนมปัง(คำนาม)

BRIDGE(N.)
บริดจ์
สะพาน(คำนาม)

BRUSH(N., V.)
บรัชชฺ
แปรง, หวี
(คำนาม, กริยา)

BUTTER(N.)
บัท เถอะ
เนย(คำนาม)

BUILD(V.)
บิลดฺ
ก่อสร้าง(คำกริยา)

BURN (V., N.)
เบิร์น
เผา, จุด, ไหม้
(กริยา, คำนาม)

🔊

CAKE (N.) 🔊
เคคคุ
ขนมเค้ก
(คำนาม)

CAMERA(N.)
แคเมอระ
กล้องถ่ายรูป(คำนาม)
🔊

CALCULATOR(N.)
แคลคุเลเตอะ
เครื่องคิดเลข(คำนาม)
🔊

CALENDAR(N.)
คะ เลน เดอุ
ปฏิทิน (คำนาม)

CAREFUL(ADJ.)
แคร์ฟูล
ระมัดระวัง(คำคุณศัพท์)

CARELESS(ADJ.)
แคร์เลส
ประมาท/สะเพร่า
(คำคุณศัพท์)

CARPET(N.)
คาร์เพ็ต
พรม(คำนาม)

COOK(V.)
คุกคฺ
ประกอบอาหาร
(กริยา)

PUMPKIN(N.)
พัมพฺ คินนฺ
ฟักทอง
(คำนาม)

BIOGRAPHY

NAME   Mr. Kasikarn Bansong

DATE OF BIRTH   20-March-1998

PLACE OF BIRTH   Nakhon Ratchasima, Thailand

ADDRESS   99 Div.5 Sub-District: Ban Kruat District: Ban Kruat
                      Buriram Province. 31180

POSITION   Teacher of English

PLACE OF WORK   Sornthipaya Kindergarten School

EDUCATION   2012 Junior High School in Tawanchai Witthaya School
                      2015 Senior High School in Nongkipitthayakhom School
                      2016 Bachelor of Arts (Hotel and Tourism),
                      Mahasarakham University, Thailand
                      2023 Master of Education (M.Ed.) Program in English
                      Language Teaching, Mahasarakham University, Thailand