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The Effect of TPR Tasks on Word Knowledge of Thai Primary School Learners

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Abstract

Vocabulary acquisition is a fundamental element of mastering the English language, necessitating a comprehensive lexicon that evolves through experiential learning to facilitate accurate comprehension and production of language. The current study examined the impact of Total Physical Response (TPR) tasks on the vocabulary acquisition of Thai primary school students, with a particular focus on the definition of words. It also explored the students' attitudes towards using TPR tasks for vocabulary learning. The TPR tasks were designed to engage three of the human senses—visual, auditory, and tactile—by incorporating multisensory tasks. Employing a mixed-methods research design, the study involved 27 second graders from a primary school in northeastern Thailand. The research methodology utilized three instruments. From a quantitative perspective, the Receptive Word Knowledge Test (RWKT) and the Productive Word Knowledge Test (PWKT) were administered to assess the students' vocabulary knowledge before and after the intervention within a single-group pretest-posttest framework. Qualitatively, a focus group interview was conducted to gain deeper insight into the students' attitudes towards participation in TPR activities. The quantitative data indicated a significant enhancement in both receptive and productive vocabulary knowledge among the participants. Furthermore, the qualitative findings highlighted the advantages of TPR tasks, with students expressing increased enthusiasm and competitive spirit and a shared willingness and pleasure in vocabulary learning through interactive tasks and peer interaction. In conclusion, this study corroborates the efficacy of TPR tasks in significantly advancing Thai primary school students' receptive and productive vocabulary knowledge.

Keywords: TPR tasks, receptive word knowledge, productive word knowledge, Thai primary school learners

1. Introduction

Vocabulary is a critical cornerstone in English language learning, underscoring the importance of a growing lexicon for learners to effectively comprehend and produce language. A profound understanding of vocabulary meanings is pivotal for children to utilize words aptly across various linguistic activities, including listening, speaking, reading, and writing (Sinatra et al., 2012). Webb and Nation (2017) highlight the communicative challenges posed by insufficient vocabulary, noting that the inability to produce the necessary words can significantly hinder the learner's ability to convey intended meanings. Consequently, a limited vocabulary obstructs language learning and intercepts communication, underscoring the direct link between the breadth of one's vocabulary and proficiency in listening, speaking, reading, and writing. Therefore, expanding learners' vocabulary is essential for enhancing their overall language capabilities and facilitating more effective communication.

Researchers argue that vocabulary development is a pivotal component of language learning, embodying a multifaceted construct encompassing form, meaning, and use—each with its own receptive and productive dimensions (Nation, 2013, 2022; Schmitt, 2010; Sukying, 2018, 2022). This comprehensive framework, further refined by Nation (2022), delineates word form as the amalgamation of phonetic, orthographic, and morphological knowledge, while word meaning delves into intricate form-meaning connections, underlying concepts, and semantic associations. Word use extends to understanding the syntactical applications, lexical combinations, and contextual appropriateness of language. To navigate this complex scenery effectively, Nation (2013, 2022) proposes a strategic approach to vocabulary acquisition through "the four strands": meaning-focused input, meaning-focused output, language-focused learning, and fluency development. Central to this methodology is the

emphasis on meaning-focused input, where engaging with texts through listening and reading activities becomes a conduit for comprehension and enjoyment. A critical threshold is established wherein learners should recognize approximately 98% of encountered words, a standard that facilitates autonomous text comprehension and underscores the indispensable role of a rich vocabulary foundation for primary learners embarking on their linguistic journey (Laufer & Ravenhorst-Kalovski, 2010; Nation, 2006, 2022). This holistic strategy champions the depth and breadth of vocabulary knowledge and underscores the significance of integrating these elements seamlessly into language education to foster proficient and confident language users.

In Thailand's English as a Foreign Language (EFL) learning, insufficient vocabulary knowledge has been identified as a primary barrier to achieving high levels of English proficiency. This deficiency in word knowledge is a significant concern, as it falls considerably short of desired proficiency levels and necessitates substantial enhancement (Chaemsai & Rattanavich, 2016). The impact of limited vocabulary extends beyond academic performance, hindering students' ability to improve their overall English language skills. Evidence from the Ordinary National Educational Test (O-NET) underscores this challenge, revealing that Thai primary school students consistently score lower in English than in other core subjects. This trend has persisted over the past decades (Mala, 2021). Furthermore, Intasena and Nuangchalerm (2022) explored the instructional challenges related to literacy and fluency in reading and writing among young Thai learners. Previous research pointed out that difficulties in teaching these skills stem from the learners' limited understanding of textual language systems, including aspects of spelling, meaning, and usage, both in receptive and productive capacities. These studies underscore insufficient vocabulary knowledge among Thai EFL learners, which is a significant barrier to learning English.

According to the classroom context, the second graders studying at the school in the northeastern part of Thailand have been learning English for one year. Insufficient skill at the elementary school level in acquiring and expressing vocabulary is often found in learning English. Moreover, inadequate lexical knowledge may obstruct students from enhancing their English proficiency. Therefore, by addressing the problem of insufficient English vocabulary through effective strategy, learners can enhance their vocabulary, improve their language skills, and overcome the challenges associated with limited vocabulary.

To enhance vocabulary acquisition among primary learners, teachers are encouraged to employ dynamic techniques that promote active learning and retention of words. A pivotal observation in this context is the significant improvement in learners' ability to recall and use new vocabulary when paired with a corresponding action. For instance, when a teacher demonstrates the word "a house" while simultaneously making a gesture resembling a rooftop, learners are more likely to mimic the gesture and repeat the word promptly. This method of combining physical movement with verbal instruction not only aids in memorization but also in deepening the understanding of the word's meaning. Such an approach aligns closely with TPR principles, a teaching method developed by Dr. James J. Asher (1970) that emphasizes the connection between speech and physical movement. TPR is designed to mimic the natural language acquisition process, making it particularly effective for learners to internalize new vocabulary through action or imitation. TPR emphasizes the synergy between language learning and physical response, promoting the acquisition of the target language through actions. In this method, English as a Foreign Language (EFL) teachers issue commands in the target language that require immediate physical responses from the learners, such as jumping or clapping hands. Students focus on understanding and acting out the teacher's commands without verbal repetition. The teacher plays a central role, guiding the class through various commands or language chunks.

Furthermore, multisensory teaching is one of the teaching methods for encouraging learners to use more than one of their senses when taking in new information. This learning style promotes activities that appeal to our visual, auditory, kinesthetic and tactile senses. Sensory instruction engages different parts of a learner's brain. This method allows them to express what they have learned in various ways. Moreover, multisensory teaching notes that children have different ways of learning from each other. This can help meet the diverse needs of all children, not just those with learning and attention problems. Besides, providing many learning ways gives children a chance to succeed in language learning (Morin, 2019). For example, in an activity that incorporates visual, tactile, and auditory learning, children can form a relationship between the appearance, feeling, and sound of that activity, which will then help them remember key information from that task. Quak et al. (2015) support the significance of multisensory learning, emphasizing the link between multisensory processing, inner attention, and multisensory processing. This implies that multisensory information requires more attention and helps later free-recall and retention. Senses as modalities of acquiring new information can affect the quality and richness of sensory inputs learners receive from the environment, meaning that single-sense input may lead to a different memory formation compared to the combination of several senses (Pilehvar et al., 2017).

Therefore, there has been scant investigation into the capacity of TPR tasks to elicit physical responses from learners and to engage human senses—sight, hearing, and touch—in the learning process. By incorporating TPR tasks, this study seeks to shed light on vocabulary acquisition and expansion dynamics, exploring how the sensory engagement facilitated by TPR can enhance language learning in young EFL learners. This focus on sensory stimulation through TPR tasks offers a promising avenue for understanding and improving vocabulary learning outcomes, potentially providing valuable insights into the mechanisms underlying effective language acquisition for young learners.

2. Literature Review

2.1 Word Knowledge

Vocabulary knowledge encompasses understanding various aspects of words and their usage (Laufer et al., 2004; Milton, 2009; Nation, 1990, 2001). Schmitt (2000) defines this comprehension as including vocabulary structure, productive and receptive fluency, and overall proficiency. Vocabulary knowledge involves knowing a word's definition and its appropriate application within specific contexts. Later, Nation (2022) describes what learners must know in word learning. Knowledge of form included the ability to use a word's phonological and morphological elements in both writing and speaking. The knowledge of meaning is when a learner has insight into form and meaning, concepts and referents, and association. Finally, the knowledge of use describes where each word can be used accurately. It consists of grammatical functions, collocations, and constraints on use. He classifies each aspect into receptive and productive knowledge. Receptive word knowledge refers to the ability to recognise different forms and meanings of a word. In contrast, productive word knowledge is the ability to recall and retrieve the forms and meanings of the word and use it appropriately in context (Sukying, 2018). Therefore, productive vocabulary can be addressed as an active process because the learners can produce the words to express their thoughts to others (Webb, 2005).

Nation (2022) conceptualises the three aspects of knowing a word: form, meaning, and use. The three aspects are shown in Table 1.

Table 1. Aspects of word knowledge (Nation, 2022, p. 54)

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 spelt?
	Word parts	R	What parts are recognisable 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?
	Concepts 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 functions	R	In what patterns does the word occur?
		P	In what patterns must we use this word?
	Collocations	R	What words or types of words 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 expect to meet this word?
		P	Where, when, and how often can we use this word?

Note. R = receptive, P = productive

Nation (2022) further explains that receptive knowledge is acquired more easily and develops faster than productive knowledge as the cognitive load to process input is less than productive language output. However, as Nation (2022) has put it: "understanding a word does not necessarily result in being able to use the word appropriately" when needed in speech or writing. In contrast, productive knowledge or using a word in speech or writing is more challenging as it requires the recall of words and knowledge of how to correctly convey meaningful messages. Consequently, productive knowledge is more profound as it requires knowledge of a word's pronunciation, spelling, and pragmatics. However, the receptive and productive distinction is essential in word knowledge.

2.2 Behaviorism Theory

The theory of behaviourism was developed by B.F. Skinner. This theory views learning as resulting from imitation, practice, reinforcement, and the formation of habits (Lightbown & Spada, 2013). The central tenet of behaviourist theory is analysing human behaviour in terms of observable stimulus-response interactions with the surrounding environment. Since children continue to imitate and practice sounds and patterns until they develop 'habits' of correct language use, the quantity and quality of language heard and the consistency of reinforcement by others will shape their language behaviour (Broad, 2020). Language is compared to the linguistic input children must acquire from their environment. The objective of instruction from a behaviourist perspective is to elicit the desired response from learners when a target stimulus is presented. To achieve this, students must understand how to execute the correct response and under what circumstances it should be made. Therefore, vocabulary instruction entails presenting the target stimulus (target words) and providing learners with opportunities to practice the correct responses.

2.3 Cognitive Processes

Cognitive processes for second language acquisition focus on the individual's mind as an information processor. Some of these theories use the computer as a metaphor for the mind, comparing language acquisition to the storage, integration, and retrieval capabilities of computers. The theory focuses on how the brain processes information and how internal information processing facilitates learning. According to Nation (2022), the memory of a word may result from three general cognitive processes: noticing, retrieval, and creative use. Firstly, Richard Schmidt (1990, 2001) proposed that nothing can be learned unless it is first "noticed". Noticing does not result in acquisition, but it is a necessary prerequisite. This implies that students must recognise the word as a helpful language resource (Ellis, 1991; McLaughlin, 1990; Schmidt, 1990). Negotiation words are an integral part of this process. Secondly, retrieval is the major process that may lead to a remembered word (Baddeley, 1990). After recognising and comprehending a word's meaning from completing a task or a teacher's explanation, the word will be retrieved, and the memory of that word will be strengthened. Lastly, Creative processing occurs when previously encountered words are reencountered or used differently. Nation (2022) explained that the new encounter with the word compels students to rethink their prior understanding. When information is input from the environment, processed, and stored in memory, the cognitive processes hold that learning consists of forming associations between new and stored information. In conclusion, students can acquire faster, more accurate, and automatic vocabulary applications through such processing.

2.4 Total Physical Response (TPR)

Teaching English vocabulary, particularly to primary learners, requires adequate and interesting methods to engage students' interest and motivation to learn. Total Physical Response is a recommended method for teaching vocabulary, especially for young learners. Total Physical Response (TPR) was developed by Dr. James J Asher (1970). TPR is a language teaching method built around the coordination of speech and action; it attempts to teach language through physical activity (Richards & Rodgers, 2001). The procedure for TPR in the classroom is as follows. First, students listen to a teacher giving and acting the commands. Then, they listen and repeat the actions without repeating the words. The teacher is at the center and leads the class with commands or chunks (Magnussen & Sukying, 2021). For instance, when using this method, EFL teachers give a series of commands in the target language (e.g., jump and clap your hands), while learners are expected to respond with body movements (e.g., to jump while clapping their hands).

Moreover, Asher argued that TPR improves learning since it activates the brain's right hemisphere during the process, helping learners relax and enjoy acquiring languages (Richards & Rodgers, 2014). However, learners should not be forced to produce language but should be encouraged to listen, act out the actions, and speak when ready (Richards & Rodgers, 2014).

2.5 Multisensory Engagement in Vocabulary Learning

Young children's initial perception and learning are enhanced by sensory information from both visual and auditory sources (e.g., Gogate & Hollich, 2016; Samuel et al., 2011). This multisensory information is richer than visual and auditory; it also includes touch. Information acquired from increasing sensory channels could help or hinder the acquisition and recognition of words. It could occur by using information from growing numbers of sensory channels to 'enrich' the encoding of a new label attached to an object, supporting to ensure that it is retained and retrieved later. On the other hand, the ability to process information across several senses increases with maturity (e.g., Lewkowicz, 2014). According to Massaro (2004), Tabatabaee et al. (2020), and Pishghadam et al. (2021), multisensory learning can assist in vocabulary acquisition by engaging students' attention. This approach creates an environment that is conducive to vocabulary retention and effective communication. It is

suggested that information from more sensory modalities entails the undemanding and less internal concentration of the brain during L2 comprehension (Pishghadam, Daneshvarfard et al., 2021). Therefore, various degrees of sensory enrichment can affect how new vocabularies are perceived and retained. This can be explained by the fact that students are taught through the use of senses, which activates different parts of the brain simultaneously and indirectly enhances memory and the learning of written language.

2.6 Related Vocabulary Studies Through TPR Activities

Several previous studies have examined the effects of TPR tasks on vocabulary acquisition. For example, Tingting Shi (2018) conducted a controlled study of the TPR method for teaching English to elementary school students. One group of students is instructed to use the TPR method, while the other group is trained to use the conventional method. The scores of the experiment group are significantly higher than those of the control group in these tests. TPR teaching method enables students to use their hands and brain in learning and stimulates students' variety of senses. Therefore, this experiment indicates that TPR is a more effective method of instruction. In addition, Nugraheni and Kristian (2018) demonstrated that the TPR method could increase student interest in learning and English comprehension. The outcome revealed the students' highest and lowest pre-and post-test scores. The average pre-test score was 71.25, while the average post-test score was 87.5. These results reflect the changes and advancements that students have experienced. Plus, Nguyen Dinh Nhu Ha et al. (2020) investigated the impact of the Total Physical Response (TPR) Method on vocabulary retention and young learners' attitudes towards it. It included sixty-two young English learners (YLs) between 10 and 11 from the Viet Uc English Language Center (VUC) in Bien Hoa City. Three instruments, including a pre-and post-test in addition to an interview, produced quantitative and qualitative data. The results demonstrated that TPR affected the YLs' vocabulary knowledge by increasing their vocabulary retention after treatment. Similarly, this study revealed that YLs had positive attitudes toward using TPR in vocabulary instruction and acquisition. Using total physical response (TPR) and songs, kindergarten students in Thailand significantly improved their vocabulary knowledge, according to another study (Magnussen & Sukying, 2021). This research indicates that targeted vocabulary acquisition through various activities can facilitate vocabulary learning and enhance young learners' word learnability (Magnussen & Sukying, 2021). Freire González and Nicole Alejandra (2023) analysed the effect of implementing the Total Physical Response to improve the English vocabulary of sixth-grade students. The findings demonstrated that using physical movements and interactive material to develop English language skills by combining enjoyable and exciting strategies where students are concerned about performing physical movements helps to increase the vocabulary of the contents of the second language.

In addition to using TPR exclusively for vocabulary instruction, other researchers have examined the impact of integrating or comparing TPR with different teaching methods. For instance, Fan-Ray Kuo et al. (2014) investigated the effects of an embodiment-based TPR approach on students' achievement, retention, and acceptance of English vocabulary learning. Fifty fifth-grade students participated in this investigation. The experimental group used an Embodiment-based TPR learning strategy, while the control group used a conventional TPR learning strategy. Neither the post-test nor the delay test revealed a statistically significant difference between the two groups' English vocabulary learning performance. In contrast, the experimental group's retention of information remained stable, whereas that of the control group significantly decreased. The implication is that Embodiment-based TPR may enhance learning retention more than conventional TPR. Regarding the vocabulary acquisition of young students, Kara et al. (2019) favored TPRS instruction for language and literacy. Nineteen four-year-old Turkish EFL kindergarten students participated in the study's single treatment group, which employed a novel technique for storytelling based on the TPR method. TPRS was found to improve memory and retention of both receptive and productive vocabulary. The treatment enhanced receptive comprehension more than productive comprehension.

In the context of Thai EFL, Panpoom et al. (2019) proposed to study and compare English vocabulary learning ability before and after studying using total physical response storytelling, to study English vocabulary learning retention, and to investigate fifth-grade students' attitudes toward teaching English vocabulary learning ability using total physical response storytelling. The students' English vocabulary skills were significantly different at the .01 level. Second, the students could maintain their vocabulary learning abilities in English. The students' attitudes toward teaching English vocabulary through total physical response storytelling were positive. In addition, the effectiveness of an instructional model integrating the total physical response (TPR) method and code-switching technique on the English proficiency of 5 to 6-year-old kindergarteners in the central region of Thailand was investigated in a second study (Chiropasworrapong et al., 2021). The test and self-report were used to assess the English proficiency and learning satisfaction of the 38 kindergarteners. The experimental group's English proficiency score was significantly higher than the control group's at the.01 level, and the experimental group's

overall satisfaction with English learning was 94.74 percent.

However, previous studies have examined the effectiveness of TPR or the effectiveness of TPR integrating with other methods in enhancing vocabulary learning. Still, limited focus has been on leveraging this method and incorporating sensory stimulation—sight, hearing, and touch—in the learning process. By incorporating TPR tasks, this study seeks to shed light on the dynamics of vocabulary acquisition and expansion, exploring how the sensory engagement facilitated by TPR can enhance language learning in young EFL learners. The present study aimed to fill the gap by looking at the effect of TPR tasks on Thai primary school learners' word knowledge. It also explored how Thai primary school learners perceive word learning through TPR activities. Two research questions were established to guide the study:

1) How do TPR tasks affect Thai primary school learners' word knowledge?

2) What is the attitude of Thai primary school learners toward using TPR tasks to enhance vocabulary learning?

3. Method

3.1 Participants and Setting

The participants were 27 primary school learners in grade two. All of the participants in this study attended the researcher's school. They were members of an intact class with a dependable and convenient environment. All participants had learned English as a foreign language (EFL) and received English lessons for at least one year of the school curriculum. They studied English for about two hours a week. The study participants were selected using the purposive sampling method. The researcher was an English teacher for primary learners in this school.

3.2 Research Instruments

This study had three instruments: the receptive word knowledge test, the productive word knowledge test, and the focus group interview.

3.2.1 Receptive Word Knowledge Test

The receptive vocabulary knowledge test was developed based on the Peabody Picture Vocabulary Test -4th edition PPVT developed by Dunn and Dunn (2007). The test included 25 target words. Each target word was displayed with a picture simultaneously with three other images, functioning as distractors. For each item, the examiner said a word, and the examinee responded by selecting the picture that best illustrated that word's meaning. One point was given for pointing out the picture correlated with the spoken target word, and no point was given if several pictures were pointed out randomly or if no picture was pointed out. The participants were given a few seconds to identify the corresponding image for each question. To assure the validity of the test, it was piloted with a different group of participants with similar English proficiency levels and educational backgrounds.

3.2.2 Productive Word Knowledge Test

The word knowledge test was adapted from the Expressive One-Word Picture Vocabulary Test (Brownell, 2000). It was designed to evaluate learners' knowledge of English-speaking vocabulary. During the test, one picture representing the target word was presented to the participant, and the participant was encouraged to answer the word meaning they thought the image represented. Productive language in English and Thai was allowed to answer. A pilot study was conducted before applying the test to find the imagery value of the pictures and the test validity.

3.2.3 Focus Group

The researcher collected qualitative data through focus group interviews after administering the TPR tasks to ascertain how primary learners engaged in word learning via the TPR activities. The interviewing group comprised six students whose performance on the Receptive Word Knowledge Test (RWKT) and Productive Word Knowledge Test (PWKT) delineated three distinct levels of vocabulary knowledge. Students who obtained 60% or more scores were considered to possess a high degree of vocabulary knowledge. In contrast, those who scored 40% or less were classified as having a low understanding of words. Students whose score fell within the intermediate range of 41% to 59% were identified as having a moderate command of vocabulary knowledge. The participants articulated their personal thoughts and emotions regarding particular matters while shedding light on the divergences of viewpoints among different groups. Through content analysis and interpretation, the researcher addressed inquiries that commence with the questions "what," "why," and "how" (Lochmiller, 2021). The following are examples of questions that may be posed during focus groups:

1) What are your feelings about learning through the TPR tasks?

2) How do you like learning English words through the TPR tasks?

3) Do you want the teacher to continue to use the TPR tasks, and why?

3.3 Data Collection Procedure

3.3.1 Pre-Study Phase

The participants were administered two-word knowledge assessments throughout the initial week. The assessments evaluate the participants' receptive and productive word knowledge. To obtain quantitative data before administering the treatment, these examinations comprised 25 words derived from TPR activities involving the three human senses—vision, hearing, and touch. The participants chose the pictures and images that they believed corresponded to the spoken word. At a time, one person was evaluated. After collecting the participants' personal information, the researcher administered the receptive word knowledge exam. The participatory students completed the productive word knowledge exam in the following period using the identical approach.

3.3.2 The Treatment Phase

The 24 words were provided to the learners in six periods, each an hour. Each of the two periods involved each TPR task. The content schedule and target words for teaching with TPR tasks are shown in Table 2 below:

Table 2. The content schedule and target words for teaching

Week	Period	Tasks	Content	Target Words	
Week 2	1–2	What do you see?	Action verbs	sit	walk
				run	Swim
				ride	count
				sing	dance
Week 3	3–4	What do you hear?	Object nouns	car	shoes
				bike	phone
				door	pencil
				book	football
Week 4	5–6	What do you touch?	Technology nouns	phone	printer
				tablet	camera
				laptop	keyboard
				speakers	microphone

3.3.3 Post-Study Phase

After doing the entire treatment, the participants were asked to do the word knowledge test in terms of receptive and productive word knowledge again after exposure to vocabulary enhancement through TPR tasks as the treatment. After that, focus group interviews were conducted in this phase. The number of participants for the focus group was 6 participants. Figure 1 depicts the research procedure of the present study.

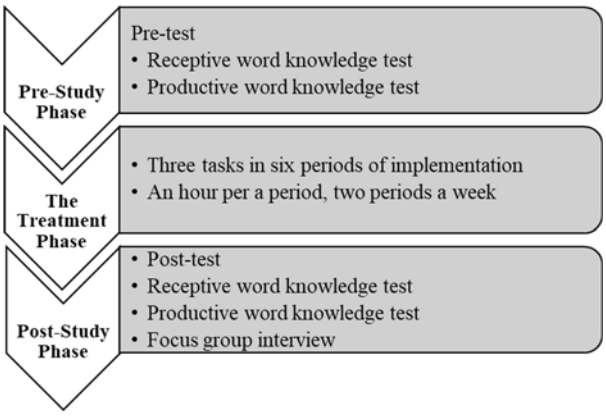

Figure 1. The research procedure

3.3.4 Word Selection and TPR Commands Construction

All target words in implementing TPR tasks were selected from the school textbook, 'Smile 2'. Eighty content

words were selected from Chapters 1 to 6 of the book. To ensure that all selected words were high-frequency and worth learning, they were checked against the New General Service List: NGSL (Browne, Culligan, & Phillips, 2013), which lists the essential high frequency of 2,818 words for L2 learners. The words not found in the list were cut out from the study.

Following Sukying's (2018) study, the target words were checked for appropriateness using the English Vocabulary Profile at the A1-A2 CEFR level. After being checked against NGSL and CEFR, the 58 target words were piloted using an English vocabulary checklist test with a different group of participants with similar English proficiency levels and educational backgrounds. Participants had 60 minutes to self-identify four levels of word knowledge: (A) I don't know the word, (B) I have seen the word before but am not sure of the meaning, (C) I understand the word when I see it or hear it in a sentence, but I don't know how to use it in my speaking or writing, and (D) I know this word and can use it in my speaking and writing. If students rated statement 'C', they were required to give a meaning of the word while writing a sentence using the target word if rated as 'D'. Any words rated as C and D were removed from the list of the target words used for the main study. The top 49 unknown words from the checklist test were used as the final targeted words.

Next, the TPR commands were constructed, which included the target words and related to the context of the target words. Also, gestures were related to the target words and were easily acted out. Each gesture was precisely different from other gestures; therefore, the participants were not confused by the gestures. For instance, the command "drive a car" was performed by sitting and controlling the steering wheel gesture while saying the command. If the target word was the verb, the command typically began with that verb, e.g., ride (v.): ride a horse. On the contrary, if the target word was a noun, the command began with the verb, which was collocated with that noun to get a clear command, e.g., door (n.): open the door. Hence, each command and gesture for the target word was performed distinctly and appropriately.

3.3.5 TPR Tasks Planning

According to the basic principle of TPR, the teaching activities, such as TPR-P (P: picture), TPR-O (O: object), TPR-B (B: body), and TPR-S (S: storytelling) were invented by Blain Ray and James (1998). Those activities influenced the current study. Moreover, the TPR tasks were designed based on three of the five senses of human beings: sight, hearing, smell, taste, and touch. To ensure that the activities were separated and there were no misleading results, the tasks were designed to stimulate the three of the five senses of human beings: sight, hearing, and touch. So, the tasks associated with the three senses of human beings are illustrated in Table 3.

Table 3. TPR tasks

Sense of human	TPR task	Material
See	What do you see?	pictures
Hear	What do you hear?	sounds
Touch	What do you touch?	objects

3.4 Data Analysis

The quantitative data collected through the tests, receptive and productive word knowledge tests, were statistically analyzed by the descriptive statistics, including mean ($\bar{X}$) and standard deviation (S.D.) in the Statistical Package for the Social Science (SPSS) software. After that, inferential statistics and t-test analysis were used to analyze whether test scores were statistically significant.

Qualitative data was gathered through focus group interviews to interpret and provide insights into the group's collective response. The data analysis commenced simultaneously with its collection, as the facilitator effectively guided the discussion. This was further supported by the addition of observational notes and the extraction of information from the interview transcripts. The labelling and sorting stages were cross-checked by another English teacher who had been extensively trained before this stage. The analysis involved examining the frequency, significance, and interconnections among specific words, themes, or concepts through content analysis. This approach allowed themes to naturally arise from the core of the data, guaranteeing that the researcher's systematic examination of the data aligned with its intrinsic content.

4. Results

4.1 The Effect of TPR Tasks on Word Knowledge of Thai Primary School Learners

As shown in Table 4, the participant's performance on the RWKT average score on the pre-test for receptive word

knowledge among the participating students was 7.74 (30.96%), with a standard deviation of 0.00. On the post-test, their average score was 11.33 (45.33%), with a standard deviation (S.D. = 2.48). Comparable to the RWKT, the mean scores of participants' performance on the PWKT pre-test and post-test were 20.56 or 27.41% (S.D. = 2.36) and 25.81 or 34.42 % (S.D. = 4.15), respectively. In addition, the data analysis indicated a statistically significant difference between the pre-test and post-test scores for both the RWKT ($t = 7.68$; $p < 0.05$). Likewise, the PWKT revealed the same statistically significant difference ($t = 8.59$; $p < 0.05$).

Table 4. A summary of students' performance on the word knowledge tests

	Tests	Pre-test			Post-test			*t*-value
Participants		$\bar{x}$	%	S.D.	$\bar{x}$	%	S.D.	
$N = 27$	RWKT (25 points)	7.74	30.96	0.00	11.33	45.33	2.48	7.68*
	PWKT (75 points)	20.56	27.41	2.36	25.81	34.42	4.15	8.59*

Note. *Significant at the 0.05 level ($p < 0.05$).

Additionally, a pair-sample t-test was performed. At the 0.05 significance level, the data analysis revealed that the difference between RWKT and PWKT scores on the pre-test performance was statistically significant ($t = 2.59$). A significant distinction was also observed in the performance on the post-test ($t = 7.18$), with a significance level of 0.05. These findings are shown in Figure 2. Together, these results suggest that different types of assessments demand varying degrees of cognitive processing.

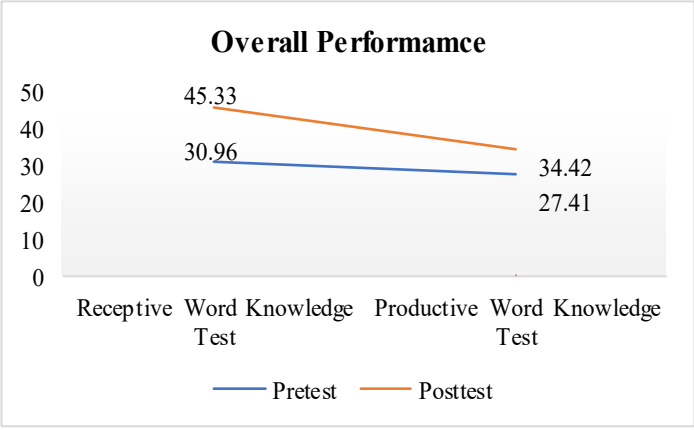

Figure 2. The summary of pre and post-test performance on the RWKT and PWKT

4.2 Participants' Engagement with TPR Tasks

The researcher transcribed the qualitative data in collaboration with an additional English teacher. A second review of the transcribed data was conducted to validate the conclusions. Behavioral and affective themes were applied to the data under the conceptual framework of student engagement in English language classrooms. Behavioral engagement refers to the concrete behavioral acts by students to participate in classroom activities and to surmount difficult content, reflecting their enthusiasm for their learning task (Fredricks et al., 2004). Affective engagement encompasses favorable and unfavorable emotional responses towards teachers, peers, activities, and learning environments. It refers to the various affective responses that students may have in the classroom, such as curiosity, boredom, joy, sorrow, and anxiety (Blumenfeld et al., 2005; Fredericks et al., 2004). The key attributes of the thematic analysis of student participation are presented in Table 5.

Table 5. The salient attributes of thematic analysis

Themes	Sub-themes	Salient characteristics
Behavioral	enthusiasm	enthusiastic, active, moving, friendly, collaborative
	competitiveness	competitive, captivating, winning, inviting
Affective	pleasure	funny, interesting, comical, amusing, entertaining
	willingness	unconfident, bored, happy, relaxing, engaged, indifferent

The statements made by the participants concerning the behavioral subtheme of learning via TPR activities are presented in Table 6.

Table 6. Participants' responses to the subtheme of enthusiasm

Cases	Statements/excerpts
S1	I liked the TPR activity. It was thrilling every class I touched an object.
S2	I loved walking around my class and playing and talking with my classmates. I can guess a meaning faster when I work with my buddy.
S3	Teacher …teacher…. I turned around and asked my friend to work together.
S4	I loved your class because I felt energetic and could not keep sitting and writing.
S5	Teacher, I was excited every time I came to your class. I ran fast to book my seat.
S6	I asked my buddy when I did not catch up with the activity. Then I could do it myself.

Concerning competitiveness, the participants expressed that TPR task-based learning was competitive. The participants engaged in the tasks while inviting one another to complete them and competed to be the first to respond. The opinions of the participatory school children about the subtheme of "competitiveness" are presented in Table 7.

Table 7. Participants' responses to the subtheme of competitiveness

Cases	Statements/excerpts
S1	I had a task race with my friends. If I am faster, I will win. It was so much fun! I gave 100 out of 10!
S2	We competed with friends during the class. Then I intend to listen and did it fast…fast…fast!
S3	I called my buddy to respond to the teacher with me. He followed me.
S4	I liked it. The activities attracted me. I want to do it again.
S5	I did not want to go back to my classroom. I loved to do the activity here. When I saw a picture, I could do it.
S6	My buddy invited me and let me follow her because sometimes I was not confident.

Affective engagement was characterized by subthemes of willingness and pleasure. Pleasure pertains to the positive affective state experienced by the learner while engaging in the tasks, which motivates them to finish the tasks to sustain this emotion. Six participants thought performing the tasks and gestures in response was amusing. The participants enjoyed the exercises and laughed as they learned vocabulary through TPR tasks. The participants' perceptions about the affective domain under the subtheme of "pleasure" are presented in Table 8. These comments suggest that the primary school students considered TPR vocabulary learning tasks "funny" and "pleasuring".

Table 8. Participants' responses to the subtheme of pleasure

Cases	Statements/excerpts
S1	I had a task race with my friends. If I am faster, I will win. It was so much fun! I gave 100 out of 10!
S2	Teacher… You know? When I worked with my buddy, I laughed so hard that I gasped for breath.
S3	The sound that you used interests me. I love listening and responding to you the most.
S4	I could see a picture, hear a sound, and touch an object in class. I enjoyed it!
S5	I saw my classmates doing the activity. It was amusing. We cannot stop doing that.
S6	The task 'What do you touch?' was the most interesting for me.

Regarding willingness, participants reported experiencing both favorable and unfavorable feelings about learning vocabulary through TPR activities. For unwillingness, few individuals expressed experiencing boredom, indifference, and lack of confidence at some juncture during the learning process of TPR activities. The findings

from the data analysis indicated that the respondents preferred engaging in learning activities by observing their peers instead of actively undertaking the tasks themselves. However, most participants reported feeling joyful, at ease, and involved while participating in the activities. The statements made by the participants regarding the subtheme "willingness" are visually represented in Table 9.

Table 9. Participants' responses to the subtheme of willingness

Cases	Statements/excerpts
S1	The gestures that we do following you were very engaging. We had never done it before.
S2	Sometimes, I was tired of laughing because we did it many times. I might feel bored.
S3	We must not jot down like other classes, but we can remember the word's meaning. I felt I was better at English.
S4	Teacher…teacher…sometimes, I was inattentive because I was exhausted.
S5	I did not want to go back to my classroom. I loved to do the activity here. When I saw a picture, I could do it.
S6	My buddy invited me and let me follow her because sometimes I was not confident.

5. Discussion

5.1 The Effects of TPR Tasks on Thai Primary School Learners' Word Knowledge

Utilizing TPR tasks, this study investigated the word knowledge of Thai primary school learners. The results indicated that TPR tasks significantly increase word knowledge, particularly for the definitions of words, among primary school students in this study. TPR, grounded in second language acquisition theories and behaviorist perspective, emphasizes learning through physical engagement and imitation. As students observe and replicate the actions demonstrated by their teacher, they form associations between movements and the corresponding vocabulary. Integrating physical movement with language learning is believed to activate the brain's right hemisphere, which is associated with non-verbal and spatial tasks, thereby enhancing the recall of newly learned words. This approach holds that the meaning of a word is acquired via imitation, practice, and reinforcement. Repetitive exposure to TPR tasks establishes associations between words and their meanings, in which positive reinforcement is frequently administered for the proper definition of a word as indicated by bodily responses (touch, see, and hear) to a stimulus. The use of tangible rewards in TPR enables instantaneous evaluation and modification of comprehension, cultivating a nurturing educational setting that reduces anxiety associated with language acquisition. Finally, relaxed learners with low anxiety levels are likely to acquire the language better (Richards & Rodgers, 2014).

Additionally, the result of the study illustrates that the student's performance on the receptive knowledge test is higher than on the productive knowledge test. In this regard, the PWKT requires a heavier processing demand on Thai primary school students than the RWKT. The productive word knowledge test involves using different types of knowledge, including cognitive awareness and metacognitive strategies, to retrieve the form-meaning link of the target word on the picture. This result aligns with the previous claims that language production requires a heavier processing demand than language reception (Sukying, 2018, 2022). The current finding also suggests that total word knowledge should be viewed as an ongoing learning process, as primary school pupils' ability to recall the meaning of a word is not guaranteed by their recognition of its meaning. The high mean scores on the receptive knowledge test may be attributed, at least in part, to the limited opportunities for individuals to practice recalling and retrieving its meaning in real-life situations.

The development of the word's meaning could be accounted for by the concept of cognitive process to vocabulary learning emphasizing noticing, retrieval, and creative use in TPR activities. Through TPR, students physically act out words or commands, which inherently requires them to notice and pay focused attention to the word being used. This physical engagement acts as a powerful mechanism for embedding a learned word in memory, leveraging the cognitive process of noticing by making the word's form and meaning unmistakably clear and memorable. The repetitive nature of TPR activities (seeing, touching and hearing) also enhances the retrieval process. Each time students physically respond to a command or verbal cue, they retrieve the definition of the associated words from memory, reinforcing their ability to recall this information. The creative use of word knowledge is also inherent in TPR, as students are often required to respond to variations in commands. As such, TPR activities serve as a bridge between cognitive vocabulary learning strategies and practical word application, embodying the principles of noticing, retrieval, and creative use in a dynamic and interactive format. This approach allowed primary school participants to connect the word's meaning with the combination of gestures and TPR activities, such as visual, auditory, and tactile stimuli, to comprehend and memorize the vocabulary effectively.

The "What do you see?" task is designed to activate participants' visual perception. Presenting a visual depiction

of the word is tangible, facilitating a stronger grasp and retention of the word. Moreover, visual stimulation is essential to learning because it is necessary for understanding. Imagery helps the learners to comprehend and remember the word. Imagery aids the learners in comprehending and remembering the material (Sarudin et al., 2019). While it may be possible to recite abstract concepts, they are not truly understood until imagery is evoked (Ewy, 2003). Therefore, integrating visual components in teaching vocabulary not only boosts the acquisition of new words but also engages visual sensory processing, making learning more effective and memorable.

Moreover, the "What do you hear?" activity enhances auditory recognition of the word's definition by engaging the primary school students' sense of hearing. Auditory activities can assist the learners in memorizing the words through listening. This ensures that the students engage their brains to their fullest capabilities, increasing the likelihood of remembering the material (Jensen, 1998; Wilmes et al., 2008). Therefore, incorporating auditory stimuli into learning exercises is crucial for auditory recognition, facilitating a richer comprehension of language and bolstering the efficacy of language acquisition efforts.

The "What do you touch?" task introduces tactile engagement by allowing primary school students to physically interact with objects, thereby invoking their sense of touch. The tactile experience creates a unique sensory link with the word, where touching an object and associating it with its name can significantly strengthen the students' connection to the word and its conceptual meaning. This learning technique often engages fine motor skills, so it may challenge children who struggle with this (Maheshwari, 2016). Engaging the tactile senses in this manner not only aids in vocabulary building but also in deepening language comprehension through physical interaction with the learning material.

According to Maheshwari (2016), when teachers use sensory to teach the learners, the learners are encouraged to gather information about a task. The learners do various kinds of activities to gather the information and store it in their brains. It also aids learners in linking the information to ideas they already know and understand from conducting different types of activities. Thus, the learners are taught by including their senses in the learning process, activating other parts of the brain, enhancing memory, and learning written language.

As students are exposed to the target language, the activation of diverse sensory channels plays a crucial role in reinforcement neural pathways, facilitating easier information retrieval later on. Incorporating visuals, sounds, and tangible objects (realia) into instructional activities (TPR) enables students to recognize and comprehend the meaning of words more effectively, thus enhancing vocabulary acquisition. The present findings provide empirical evidence to support the previous claim that TPR activities are beneficial for vocabulary learning, thereby affirming the effectiveness of TPR in language acquisition (Bansong, Poopatwiboon, & Sukying, 2023; Lampai & Sukying, 2023; Magnussen & Sukying, 2021; Yowaboot & Sukying, 2022).

5.2 Thai Primary School Learners' Attitudes Towards Using TPR Tasks to Enhance Vocabulary Learning

The qualitative analysis shed light on the underlying attitudes and behaviors that support the effectiveness of TPR tasks in vocabulary acquisition among Thai primary school students. The thematic insights into behavioral and affective responses highlight the positive impact of TPR on students' engagement and motivation, offering valuable perspectives on the pedagogical benefits of incorporating physical response activities in language learning contexts. This approach is supported by previous studies (Duan, 2021; Fan-Ray Kuo et al., 2014; Magnussen & Sukying, 2021), indicating that TPR tasks create an engaging learning environment that captures students' attention towards targeted vocabulary. The inclusion of physical movement within these tasks, which stimulates various sensory modalities, including sight, sound, and touch, contributes to a relaxed and enjoyable learning atmosphere, thereby reducing anxiety and enhancing learner enjoyment. This feedback underscores the value of incorporating TPR tasks into vocabulary learning, demonstrating their effectiveness in improving word knowledge and promoting a dynamic and collaborative classroom atmosphere conducive to the learning preferences of young students. The students' excerpts could support this claim:

"I loved walking around my class and playing and talking with my classmates. I can guess a meaning faster when I work with my buddy." (S2)

"I loved your class because I felt energetic and could not keep sitting and writing." (S4)

"Teacher, I was excited every time I came to your class. I ran fast to book my seat." (S5)

The participants also perceived TPR tasks as 'competitiveness' because they were satisfied with this competitive learning atmosphere. Furthermore, the participants were gratified to be the winner when interacting with their classmates. The statements were given to support the finding:

"I had a task race with my friends. If I am faster, I will win. It was so much fun! I gave 100 out of 10!" (S1)

"We competed with friends during the class. Then I intend to listen and did it fast…fast…fast!" (S2)

With regard to the affective dimension, the participants stated that learning through TPR tasks encouraged pleasure and willingness. The qualitative data analyses showed that TPR tasks support a positive atmosphere in vocabulary learning. Also, the participants enjoyed and were comical in responding to the tasks. These excerpts could provide evidence to support this claim:

"…I laughed so hard that I gasped for breath." (S2)

"I could see a picture, hear a sound, and touch an object in class. I enjoyed it!" (S4)

"I saw my classmates doing the activity. It was amusing. We cannot stop doing that." (S5)

Still, although TPR tasks encourage a positive atmosphere in language learning, it is the bar for shy students who would be confident to act out or to respond to the teacher. So, these participants might face challenges regarding social interaction, communication, or expressing themselves. This may be due to shyness to engage with others or personal traits. These excerpts could support the claim:

"My buddy invited me and let me follow her because sometimes I was not confident." (S6)

6. Conclusion

The current study explored the effectiveness of Total Physical Response (TPR) tasks in facilitating vocabulary acquisition among Thai primary school learners. By integrating multi-sensory activities—visual (see), auditory (hear), and tactile (touch)—into the learning process, the quantitative results demonstrated a positive impact on enhancing students' vocabulary knowledge, particularly in the domain of word meaning. Moreover, the qualitative findings underscore the significant advancements in word knowledge among primary school learners engaged in TPR activities. This outcome reinforces the premise that TPR tasks significantly contribute to better vocabulary acquisition in young Thai EFL learners under their interactive and sensory-rich nature. In essence, the study corroborates the value of TPR tasks as a potent pedagogical tool for vocabulary learning in primary education. It highlights the dual benefit of TPR tasks: enhancing vocabulary knowledge while creating a motivating and engaging learning atmosphere. The findings advocate for integrating TPR tasks into EFL vocabulary teaching strategies, suggesting that such an approach can significantly improve language learning outcomes for young learners. Indeed, this study affirms the role of TPR tasks in enriching the vocabulary learning experience for primary school EFL learners. By demonstrating the effectiveness of these tasks in both improving vocabulary knowledge and fostering a positive learning environment, the research contributes valuable insights into the field of language learning, offering a practical methodology for teachers seeking to enhance vocabulary acquisition among young learners.

7. Recommendation

Future research should address the identified limitations by exploring a wider range of educational settings. Additionally, expanding the sensory scope of TPR tasks could further enrich the learning experience and yield even more significant improvements in vocabulary acquisition. Secondly, future research endeavors are thus encouraged to adopt a more holistic approach by incorporating both form and meaning elements of vocabulary knowledge within a single study framework. Such an inclusive approach would potentially offer deeper insights into vocabulary acquisition and retention nuances. Thirdly, further research could explore the inclusion of tasks that stimulate the remaining senses—taste and smell—thereby providing a more comprehensive sensory engagement for learners. By expanding the sensory stimuli used in TPR tasks, researchers could investigate the potential for enhanced vocabulary acquisition and recall, offering a richer, more immersive learning experience.

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Authors' contributions

Both Wiphawee Dongsanniwas and Dr. Apisak Sukying were responsible for study design and data analysis. Wiphawee Dongsanniwas mainly handled the literature review and data collection. Dr. Apisak Sukying provided ongoing guidance and consultation throughout the entire research process. Both authors jointly analyzed the data, interpreted and discussed the findings. Wiphawee Dongsanniwas drafted the manuscript and Dr. Apisak Sukying revised it. Both authors read and approved the final manuscript. The two authors have contributed equally to the study.

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No additional data are available.

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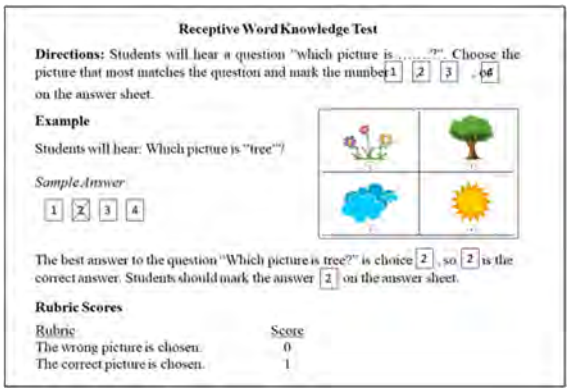
Appendix A. Receptive Word Knowledge Test



Receptive Word Knowledge Test

Directions: Students will hear a question "which picture is ……?". Choose the picture that most matches the question and mark the number 1 2 3 4 on the answer sheet.

Example

Students will hear: Which picture is "tree"?

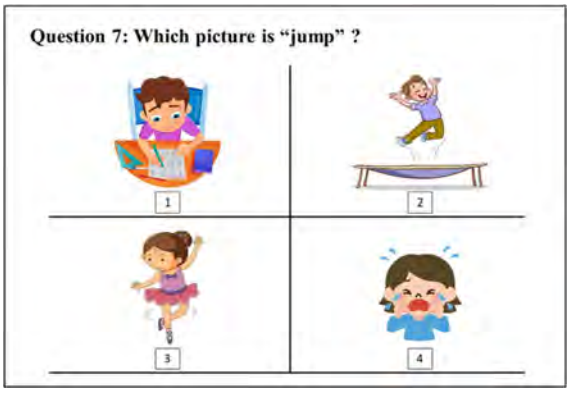
Sample Answer

1 2 3 4

The best answer to the question "Which picture is tree?" is choice 2, so 2 is the correct answer. Students should mark the answer 2 on the answer sheet.

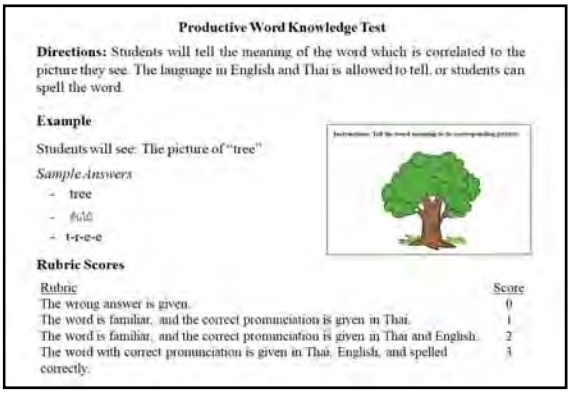
Rubric Scores

Rubric	Score
The wrong picture is chosen.	0
The correct picture is chosen.	1



Question 7: Which picture is "jump" ?

1 2 3 4



Productive Word Knowledge Test

Directions: Students will tell the meaning of the word which is correlated to the picture they see. The language in English and Thai is allowed to tell, or students can spell the word.

Example

Students will see: The picture of "tree"

Sample Answers

- tree
- ต้นไม้
- t-r-e-e

Rubric Scores

Rubric	Score
The wrong answer is given.	0
The word is familiar, and the correct pronunciation is given in Thai.	1
The word is familiar, and the correct pronunciation is given in Thai and English.	2
The word with correct pronunciation is given in Thai, English, and spelled correctly.	3

Instructions: Tell the word meaning to its corresponding picture.