# Word Retention based on the Picture Word Inductive Model (PWIM) among Thailand's Twelfth Graders

Pipatpong Taipipatkit
Study in Master of Arts Program in English Language Teaching
Language Institute, Thammasat University
Corresponding Author E-mail: leang_za@hotmail.com
Received May 31, 2024; Revised June 21, 2024; Accepted August 14, 2024

## Abstract

This study investigates the effectiveness of the Picture Word Inductive Model (PWIM) in enhancing vocabulary retention among 40 twelfth-grade students which consist of 23 males and 17 females in a bilingual school in Thailand. The research aimed to address the following questions: (1) Is there a significant improvement in vocabulary retention by the use of pictures based on PWIM? (2) To what extent does the use of pictures based on PWIM facilitate the word retention rate among twelfth-grade students? The participants, aged 16 to 19, were selected using purposive sampling, focusing on students with low grades (1-2), equivalent to grades C and D in English. The tools used in the study were designed to measure different aspects of vocabulary learning and retention. A vocabulary screening test was administered to establish baseline vocabulary knowledge. Following the instructional intervention using PWIM, an immediate post-test was conducted to assess vocabulary acquisition right after the intervention. Finally, a delayed post-test was administered two weeks later to evaluate long-term retention. The results indicated significant vocabulary acquisition immediately following the PWIM intervention, which addresses the first research question. However, for the second research question, the findings showed no statistically significant differences in long-term retention between the immediate and delayed post-test scores. This suggests that while PWIM is effective for immediate vocabulary learning, its impact on long-term retention requires additional reinforcement strategies. The study discusses the implications for educational practice and suggests directions for future research.

**Keywords**: Picture Word Inductive Model (PWIM); vocabulary retention; bilingual education; English language learning

## Introduction

The acquisition of vocabulary is a key element in language learning, enabling effective communication and comprehension in a second language. The importance of vocabulary cannot be overstated, as it profoundly affects learners' reading, writing, and overall language abilities (Schmitt, 2020, Nation, 2022). In order to communicate effectively, it is necessary to have a broad vocabulary, as a limited one can impede learning and communication. Developing one's vocabulary is, therefore, critical when learning English. Students can improve their English proficiency by listening to native speakers, reading authentic sources, and practicing what they have learned in everyday conversations. A significant challenge is to acquire and utilize new words effectively. An extensive vocabulary is crucial for constructing sentences, engaging in meaningful discourse, and connecting with others successfully.

Thailand has felt the widespread effects of globalization, much like other countries. The introduction of new technologies and the Internet has dramatically transformed various sectors, including business, education, research, and technological innovation. As education continues to evolve, English has become crucial for global intercultural communication, and Thailand is no different. The Thai education system faces the challenge of adapting instructional methods to keep pace with these changes, aiming to equip students with essential 21st-century skills and knowledge. English proficiency, as an international language, has become especially important (Tang, 2020).

Fluency among Thai students remains a significant issue. Many students struggle with English usage, even though it is part of the curriculum. In 2024, EF Education First's English Proficiency Index ranked Thailand 101st out of non-native English-speaking countries. The index, based on exams taken by over 2 million people from 113 countries and regions, placed Thailand last among non-native English-speaking nations. Although Thailand has the third highest Human Development Index in ASEAN, its English proficiency scores remain low, with the country being categorized as having "low to extremely poor English competence" since 2011 (EF EPI 2024 – EF English Proficiency Index – Thailand, 2024). This data highlights the ongoing difficulties Thailand faces in achieving and mastering English proficiency.

The Picture Word Inductive Model (PWIM), developed by Calhoun (1999), utilizes images to introduce and reinforce vocabulary, aiming to make new vocabulary more accessible for students. The structure of PWIM lessons follows the four stages of the inductive teaching model. In the first stage, students identify and list data, followed by the second stage where they classify data based on common elements. The third stage involves analyzing, interpreting, and converting data into skills or hypotheses. This approach encourages inductive thinking rather than passive learning, guiding students to achieve conceptual control and apply their understanding through skills like classification, reclassification, and hypothesis development.

Using visual material in the classroom while teaching vocabulary has potential benefits that were fostered by previous research. Recent studies have found that visual material helps students with memory (Bates & Son, 2020, Liando et al., 2022, Pickering, Peters, & Crewther, 2023). Teachers using visual material in a language-learning context will have a greater chance of helping students remember not only the words that are the focus of the lesson but also how they are used. This is because the learners have additional cues (pictures, graphics, and even videos) to link to the lesson content. If pictures are worth a thousand words, then why not use them to help with vocabulary instruction in a language-learning context? When teaching abstract words, it makes even more sense to use visual material (Chung, 2023 ) The memory gains that visual instruction brings are not only in class, but also after class when the student must recall the words that were tasked to them. In sum, vocabulary is much more likely to be remembered when visual material is used.

The effects of PWIM on English vocabulary among twelfth-grade students in a Thai bilingual school are the focus of this study. In addition to immediate effects, this study considers the long-term effects of PWIM on vocabulary learning. By using intact classes and a total of 6 weeks of instruction, which allowed for pre-tests, immediate post-tests, and delayed post-tests, this study seeks to provide conservative, but also robust evidence of the effectiveness of PWIM for the acquisition and retention of vocabulary. The main finding of this study will help reinforce the existing evidence that PWIM is an effective way for English language learners to acquire and retain English vocabulary, even at advanced proficiency levels, and across time.

The potential of this research-backed project is to provide educators in Thailand with new possibilities for effective vocabulary instruction. It offers the prospect of powerful and cost-effective strategies that enhance the impact of English vocabulary instruction—a significant priority for a school seeking an accelerated path toward English language fluency. By understanding the power of PWIM to help students retain vocabulary, educators can make sound and powerful curriculum development decisions, including strategic choices around the use of visual aids and other means for taking the next step beyond a word's basic definition, in order to penetrate its fullness and range of meaning more deeply.

## Objective of Research

The primary objective of this research is to examine the effectiveness of Picture Word Inductive Model (PWIM) in promoting vocabulary storage among Grade 12 students from a bilingual school in Thailand. Specifically, the research is planned to realize the following objectives:

1. To assess Immediate Vocabulary Acquisition: To identify the extent to which PWIM is useful in immediate vocabulary acquisition by comparing the pre-test and the immediate post-test scores.

2. To evaluate Long-term Vocabulary Retention: To determine the efficiency of long-term vocabulary retention using PWIM by comparing the immediate post-test and the delayed post-test scores.

## Methodology

### Research Design

In this research, the quasi-experimental design was utilized to assess how effective the Picture Word Inductive Model (PWIM) in enhancing the vocabulary for the twelfth-grade students. The design of the study comprises three phrases: a vocabulary screening test as a pretest, an immediate post-test right after the intervention, and a delayed post-test two weeks later.

### Participants

The investigation included 40 twelfth-graders who attend a bilingual school in Thailand. Their ages range from 16 to 19, and they were selected based on their level of English proficiency. To facilitate a variety of word problem solving strategies, the researcher intentionally recruited the

students with D and C grades in English. This ensured more than one type of student in terms of English language proficiency.

### Sampling Strategy

A purposive sampling strategy were employed to choose participants from five diverse studying majors: Math–English, English–Chinese, English–Japanese, English–Art, and English–Music. This method ensured that the study would enable students gain from the instruction provided—English learners who needed support in developing English vocabulary, with the PWIM strategy.

### Research Instruments

The research investigation involved three separate stages of testing: a Vocabulary Screening Test as a pretest administered before the study, an immediate posttest right after the treatment phase, and, finally, a delayed posttest employed two weeks after the immediate posttest.

### Validation of Vocabulary Items through Index of Item Objective Congruence (IOC)

To validate the vocabulary screening process's integrity, the researcher employed the Index of Item Objective Congruence (IOC) as a decisive selection metric. This index evaluates the experts' consensus on whether each vocabulary item is suitable for inclusion in the study. Three language education experts were asked to rate the potential items based on the study's objectives. The ratings were then averaged to generate an IOC score for each item. The researcher set a threshold for suitability: vocabulary items with an IOC score between 0.5 and 1.0 were directly incorporated without modification, while items with an IOC score below 0.5 were revised if possible or excluded if they could not be adequately revised. This process ensured that the vocabulary items used in the tests were either initially approved by experts or validated through a thorough review process.

### Vocabulary Screening Test

The vocabulary screening test consisted of 100 multiple–choice questions. Each item was associated with a black and white image and presented along with five answer options, a. – e. The choice ‘e’ for each question is included as an ‘I don’t know’ option. The design aims to ensure the selection of 60 vocabulary items that were unknown to any of the participants, and thus appropriate for studying the kind of learning that goes on across the "previously unknown" to "known" transition.

### Immediate and Delayed Post-tests

The immediate and delayed post-tests were carried out to determine how effective the short-term and long-term memories of the vocabulary items presented through the PWIM could be retained. Both the immediate and delayed post-tests featured the same quiz, comprised of 60 vocabulary words pulled from the pre-test. Test participants had four possible answers to pick from for each word to respond the displayed picture. The results of the immediate post-test were tabulated right after the test, while the delayed test was administered again two weeks later.

### Instructional Materials and Tools

The teaching method used in this intervention was the Picture-Word Inductive Model (PWIM). This model utilizes the power of visual aids to help students remember and use new words. For this intervention, 60 vocabulary words were chosen, and for each, a black and white image was created. These images came from Google Images and were manipulated in Canva, an online design platform, screening on a TV in each classroom to ensure that the pictures are clear and accurate.

### Procedure

The process of vocabulary acquisition and retention among students is intricate and multifaceted, influenced by diverse teaching methodologies and learner variables. In a structured attempt to explore the efficacy of the Picture Word Inductive Model (PWIM) in vocabulary teaching, a research study was conducted, spanning several weeks. The stages of this study—ranging from the preliminary arrangements impacted by student availability, through the core intervention phase, and culminating in post-intervention assessments—are summarized in the subsequent table. This table delineates the essential activities, descriptions, and respective durations of each phase, offering a concise overview of the research methodology employed. The study was conducted with the following stages:

Experiment Timeline

| Stage | Description | Duration |
|---|---|---|
| **Preliminary** | The commencement of research is delayed due to potential student absences at the beginning of the semester. | Week 1 |
| **Screening** | A vocabulary screening test is administered to assess participants' initial knowledge of the target words and to ensure that they are unfamiliar with these words prior to the intervention. | Week 2 |
| **Intervention** | Participants are taught the target words using the Picture Word Inductive Model (PWIM) with pictures as visual aids. During each session, 60 words were taught at a time, using images related to the unidentified vocabulary items, which were designed using Canva, for PWIM-based vocabulary instruction. In the first period, these images were projected to facilitate learning. The second period then resumed the conventional academic curriculum. This method ensures that the vocabulary instruction is integrated seamlessly into the regular educational framework, providing a dual learning experience that combines innovative and traditional approaches. | Weeks 3 – 6 |
| **Immediate Posttest** | An immediate posttest is administered to assess participants' vocabulary acquisition immediately after the intervention. | Week 7 |
| **Delayed Posttest** | The long-term retention of the words was measured through a delayed post-test. This test was used to figure out if the participants had truly mastered the words and if that mastery was going to last. The test was given far enough after the vocabulary session that any changes seen on it could not be attributed to short-term cramming. | Week 9 |

## Research results

**1. To assess Immediate Vocabulary Acquisition: To identify the extent to which PWIM is useful in immediate vocabulary acquisition by comparing the pre-test and immediate post-test scores**

**Table 1**: Mean Scores and Standard Deviations for Vocabulary Screening, Immediate Post-test, and Delayed Post-test

| Test Stage | Mean Score | Standard Deviation |
|---|---|---|
| Vocabulary Screening Test | 18.475 | 3.95 |
| Immediate Post-test | 44.125 | 8.74 |
| Delayed Post-test | 43.775 | 8.64 |

The analysis began with evaluating the scores of 40 twelfth-grade students on 60 vocabulary items, previously unknown, in a pre-test and taught using PWIM. From the table 1, the immediate post-test results showed a mean score of 44.125 out of 60, indicating significant vocabulary acquisition immediately following the intervention. This substantial gain underscores PWIM's effectiveness in facilitating rapid vocabulary learning.

**2. To evaluate Long-term Vocabulary Retention: To determine the efficiency of long-term vocabulary retention using PWIM by comparing the immediate post-test and the delayed post-test scores.**

**Table 2:** Paired-Samples t-test Results for Vocabulary Test Stages

| Comparison | t-value | p-value |
|---|---|---|
| Pre-test vs. Immediate Post-test | -22.53 | <0.001 |
| Pre-test vs. Delayed Post-test | -22.51 | <0.001 |
| Immediate Post-test vs. Delayed Post-test | 0.67 | 0.507 |

Although the delayed post-test mean score of 43.775 as illustrated in Table 1 suggests a slight decline in vocabulary retention over two weeks, scores remained impressively higher than the pre-test mean score of 18.475, highlighting PWIM's impact on vocabulary retention. However, a paired-samples t-test as shown in Table 2 yielded a t-value of 0.67 and a p-value of 0.507, indicating no statistically significant difference in long-term retention between the immediate and delayed post-test scores. This suggests that while PWIM is effective for immediate vocabulary learning, its impact on long-term retention requires additional reinforcement strategies.

**Table 3**: The paired Samples Test Statistics

| Paired Samples Test | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Paired Differences | | | | | t | df | Sig. (2-tailed) |
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| Im_posttest – De_posttest | .35000 | 3.30151 | .52202 | -.70588 | 1.40588 | .670 | 39 | .507 |

### Interpretation of Statistical Findings

Further analysis focused on the critical interpretation of the p-value obtained from the inferential statistical analysis comparing vocabulary retention between the immediate and delayed post-tests. The t-value of 0.670 and the p-value of 0.507 indicate that the observed differences are not statistically significant. This p-value exceeds the standard significance threshold of 0.05, suggesting a high likelihood that the observed differences could be due to random variation rather than the effectiveness of the Picture Word Inductive Model (PWIM). Consequently, the differences in vocabulary retention scores between the two tests are not statistically significant, implying that the observed variations might be attributed to random chance rather than the impact of PWIM.

### Summary of Findings

The study aimed to evaluate the effectiveness of the Picture Word Inductive Model (PWIM) in enhancing vocabulary retention among 40 twelfth-grade students in a bilingual school in Thailand. The primary objectives were to assess immediate vocabulary acquisition and long-term vocabulary retention facilitated by PWIM. The findings are summarized as follows:

#### 1. Immediate Vocabulary Acquisition

The mean score on the immediate post-test was 44.125 out of 60, compared to the pre-test mean score of 18.475. This substantial increase demonstrates PWIM's effectiveness in facilitating rapid vocabulary learning.

**2. Long-term Vocabulary Retention**

1) The delayed post-test mean score was 43.775, slightly lower than the immediate post-test mean but still significantly higher than the pre-test mean. This suggests some retention of vocabulary over the two-week period.

2) A paired-samples t-test comparing immediate and delayed post-test scores yielded a t-value of 0.67 and a p-value of 0.507, indicating no statistically significant difference. This suggests that while PWIM is effective for immediate vocabulary learning, its impact on long-term retention is not statistically significant.

**Interpretation**

1. The immediate post-test results demonstrated significant vocabulary acquisition immediately after the PWIM intervention, highlighting its effectiveness in rapid vocabulary learning.

2. The lack of a significant difference between immediate and delayed post-test scores suggests that the initial gains in vocabulary knowledge were not fully sustained over the two-week period without additional reinforcement strategies.

3. The high p-value (0.507) indicates that the observed differences in long-term retention might be due to random variation rather than the PWIM's inherent effectiveness.

## Discussion

The findings of this study demonstrate the effectiveness of the Picture Word Inductive Model (PWIM) in facilitating immediate vocabulary acquisition among twelfth-grade students in a bilingual educational setting. The significant improvement in vocabulary scores from the pre-test to the immediate post-test highlights PWIM's utility in enhancing students' initial vocabulary learning. However, the results also indicate that the effectiveness of PWIM in long-term vocabulary retention is less pronounced. The lack of significant differences between the immediate and delayed post-test scores suggests that the initial gains in vocabulary knowledge were not fully sustained over the two-week period. The study's results have important implications for educational practice. Educators can utilize PWIM to enhance immediate vocabulary learning by incorporating visual aids into their instructional strategies. Visual materials, such as pictures and graphics, provide additional contextual

cues that aid in the retention and retrieval of vocabulary, particularly in an English as a Foreign Language (EFL) context where abstract words can be challenging for students to grasp (Bates & Son, 2020; Liando et al., 2022) To address the limitations observed in long-term retention, educators should consider integrating PWIM with other evidence-based instructional strategies.

## Suggestions

### 1. Suggestions from Research

The findings of this study come with certain limitations. The first is the restriction of the study's sample size to just 40 twelfth-grade students from a single bilingual education institution in Thailand. This limitation means that the findings cannot be generalized to a broader population, either globally or across other schools with similar characteristics. To validate these findings, future research would need to include larger and more diverse groups of students from various schools in different locations and contexts. Additionally, the study was limited to using multiple-choice vocabulary tests, which may not comprehensively capture a student's depth of knowledge. Furthermore, the study's duration was confined to nine weeks, with only a two-week interval between the immediate post-test and the delayed post-test. Longer-term studies are necessary to determine whether these findings are sustained or if they diminish over time.

### 2.Suggestions for Future Research

Future research should explore the effectiveness of the Picture Word Inductive Model (PWIM) in different educational settings and with diverse learner populations. Studies could investigate PWIM's impact on vocabulary retention among younger learners, adult learners, or students with varying proficiency levels. Moreover, research should consider combining PWIM with other instructional strategies, such as digital tools or multimedia resources, to enhance its effectiveness. Integrating technology with PWIM could offer new opportunities for interactive and personalized vocabulary learning. Lastly, longitudinal studies are crucial for assessing the long-term impact of PWIM on vocabulary retention and overall language proficiency. By tracking learners' progress over extended periods, researchers can gain a deeper understanding of how PWIM contributes to sustained vocabulary development.

## Conclusion

This study contributes to the understanding of the Picture Word Inductive Model (PWIM) and its effectiveness in enhancing vocabulary retention among twelfth-grade students. The significant gains in immediate vocabulary acquisition underscore the value of integrating visual aids into language instruction. However, the findings also highlight the need for additional strategies to support long-term retention. Future research should explore the combination of PWIM with other instructional techniques to optimize vocabulary learning outcomes.

## References

Bates, J., & Son, J. B. (2020). English Vocabulary Learning with Simplified Pictures. *TESL-EJ*, 24(3), 1-20.

Calhoun, E. F. (1999). *Teaching beginning reading and writing with the Picture Word Inductive Model*. Association for Supervision and Curriculum Development.

Chung, M. A. (2023). The efficacy of visual aids in enhancing vocabulary acquisition in EFL classes. *International Journal of Social Science and Human Research*, 6(10).6397-6403.

EF EPI 2024 – EF English Proficiency Index – Thailand. (2024). Retrieved Jun 21, 2024, from https://www.ef.com/ca/epi/regions/asia/thailand/

Liando, N. V. F., Tatipang, D. P., Tamboto, G., Poluan, M., & Manuas, M. (2022). Pictures as a Learning Media in Teaching Vocabulary. *Jurnal Ilmiah Universitas Batanghari Jambi*, 22(3), 1944-1949.

Nation, I. S. P. (2022). *Learning Vocabulary in Another Language* (3rd ed.). Cambridge University Press.

Pickering, H. E., Peters, J. L., & Crewther, S. G. (2023). A role for visual memory in vocabulary development: a systematic review and meta-analysis. *Neuropsychology Review*, 33(4), 803-833.

Schmitt, N. (2020). *Vocabulary in Language Teaching.* (2nd ed.). Cambridge University Press.

Tang, K. N. (2020). Challenges and importance of teaching English as a medium of instruction in Thailand International College. *Journal of English as an International Language,* 15(2), 97–118.