วารสารอิเล็กทรอนิกส์
ทางการศึกษา

OJED, Vol. 20, No. 1, 2025. Article ID: OJED-20-01-001
Article Info: Received 3 December, 2024; Revised 5 February, 2025; Accepted 13 February, 2025

OJED
An Online Journal
of Education
www.tci-thaijo.org/index.php/OJED

ผลของการใช้มัลติมีเดียในการเรียนการสอน เพื่อเสริมความรู้คำศัพท์ภาษาอังกฤษของนักเรียนชั้นประถมศึกษา

The Impact of Implementing Multimedia Instruction to Enhance the English Vocabulary Knowledge of Primary Students

ฟีราณี คูลีคันดาน[1] และ มณีรัตน์ เอกโยคยะ[2]**

Firani Gulikhandan[1] and Maneerat Ekkayokkaya[2]**

บทคัดย่อ

งานวิจัยนี้มีเป้าหมายเพื่อเสริมความรู้คำศัพท์ภาษาอังกฤษของนักเรียนผ่านการใช้มัลติมีเดียในการเรียนการสอน โดยบทเรียนได้รับการออกแบบตามหลักการใช้มัลติมีเดียในการเรียนการสอนจากงานวิจัย 8 ข้อของ Mayer (2014) ซึ่งมุ่งเน้นการผสมผสานการใช้ภาพและเสียงร่วมกันเพื่อเพิ่มประสิทธิภาพในการเรียนรู้ วัตถุประสงค์ในการวิจัยเพื่อ 1) ศึกษาผลของการใช้มัลติมีเดียในการเรียนการสอน เพื่อเสริมความรู้คำศัพท์ภาษาอังกฤษของนักเรียนชั้นประถมศึกษา และ 2) สำรวจความคิดเห็นของนักเรียนชั้นประถมศึกษาต่อการใช้มัลติมีเดียในการเรียนการสอนเพื่อเสริมความรู้คำศัพท์ภาษาอังกฤษ ผู้เข้าร่วมการศึกษาครั้งนี้เป็นนักเรียนชั้นประถมศึกษาปีที่ 5 จำนวน 20 คน จากโรงเรียนเอกชนแห่งหนึ่งในจังหวัดนราธิวาส ใช้วิธีเลือกโดยการสุ่มตามสะดวกแบบกลุ่มทดลองกลุ่มเดียว โดยเครื่องมือที่ใช้ในการศึกษานี้คือ แบบทดสอบก่อนและหลังเรียน และการสัมภาษณ์ความคิดเห็นต่อการสอนแบบใช้มัลติมีเดีย โดยเลือกนักเรียนจำนวน 8 คนเพื่อสัมภาษณ์จากผลของแบบทดสอบหลังเรียน การวิเคราะห์ข้อมูลใช้ paired-sample *t*-test, ค่าเฉลี่ย, ส่วนเบี่ยงเบนมาตรฐาน และการวิเคราะห์แก่นสาระ ผลการศึกษาพบว่าความรู้ด้านคำศัพท์ของนักเรียนดีขึ้นอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 นักเรียนรายงานว่าบทเรียนมีความน่าสนใจ ช่วยให้พวกเขามีสมาธิกับหัวข้อคำศัพท์และมีปฏิสัมพันธ์กับเนื้อหาภาพ อย่างไรก็ตาม มีการระบุถึงความท้าทายบางประการ เช่น เสียงเพลงพื้นหลังที่รบกวนและการออกเสียงที่ไม่ชัดเจน โดยรวมแล้ว การใช้มัลติมีเดียในการเรียนการสอนถือเป็นเครื่องมือที่มีประสิทธิภาพและน่าสนใจสำหรับการเสริมการเรียนรู้คำศัพท์ แม้ว่าจะมีอุปสรรคเล็กน้อย

คำสำคัญ : การเรียนการสอนแบบใช้มัลติมีเดีย, ความรู้เกี่ยวกับคำศัพท์ภาษาอังกฤษ, ผู้เรียนรุ่นเยาว์

[1] นิสิตมหาบัณฑิตสาขาวิชาการสอนภาษาอังกฤษเป็นภาษาต่างประเทศ (นานาชาติ) ภาควิชาหลักสูตรและการสอน คณะครุศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
อีเมล : feefirani@gmail.com
Master student in Division of Teaching English as a Foreign Language, Department of Curriculum and Instruction, Faculty of Education, Chulalongkorn University. Email: feefirani@gmail.com

[2] ผู้ช่วยศาสตราจารย์ ดร. ประจำสาขาวิชาการสอนภาษาอังกฤษเป็นภาษาต่างประเทศ (นานาชาติ) ภาควิชาหลักสูตรและการสอน คณะครุศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
อีเมล : maneerat.t@chula.ac.th
Assistant Professor (Ph.D.) in Division of Teaching English as a Foreign Language, Department of Curriculum and Instruction, Faculty of Education, Chulalongkorn University. Email: maneerat.t@chula.ac.th

*** Corresponding Author*

Abstract

This study aimed to enhance students' English vocabulary knowledge through the use of Multimedia Instruction in teaching and learning. The lessons were designed based on eight selected research-based principles for Multimedia Instruction proposed by Mayer (2014) for creating effective Multimedia Instruction, which emphasize the integration of visuals and auditory elements to optimize learning. The objectives of the study were to 1) investigate the impact of multimedia instruction on enhancing the English vocabulary knowledge of primary students and 2) explore the opinions of primary students regarding the use of multimedia instruction to enhance their English vocabulary knowledge. The study involved 20 primary five students from a private school in Narathiwat Province selected using convenience sampling. A one-group pre-test and post-test design was utilized. The research instruments included pre-tests, post-tests, and semi-structured interviews. Eight students were chosen for the interview based on their post-test performance. Data analysis was conducted using paired-sample *t*-tests, means, standard deviations, and thematic analysis. The results demonstrated that students' vocabulary knowledge significantly improved after the implementation of multimedia instruction ($p = .01$). Students reported that the lessons were engaging, helping them concentrate on vocabulary learning and interact with visual content. However, some challenges were noted, including distracting background music and unclear pronunciation. Overall, multimedia instruction proved to be an effective and engaging tool for enhancing vocabulary learning, despite minor challenges.

Keywords: multimedia instruction, vocabulary knowledge, young learners

Introduction

The importance of the English language in today's world is well acknowledged, especially among EFL (English as a Foreign Language) learners. Vocabulary plays a vital role in developing the four essential language skills: reading, writing, speaking, and listening (Teng, 2022). Developing these skills is extremely difficult without sufficient vocabulary. Binhomran and Altalhab (2021) emphasized this by stating, “Grammar allows for limited expression, but without vocabulary, no meaning can be communicated”. In particular, primary learners are taught English with a strong emphasis on vocabulary, which serves as the foundational basis for developing these essential language skills.

According to Teng (2022), children in a foreign language context continue to struggle with vocabulary acquisition. Specifically, young learners often have a limited ability to acquire and recall words. Teachers encounter considerable challenges in vocabulary development because of the inherent limitations of children's cognitive abilities. Aedo and Millafilo (2022) mentioned

that young learners are currently undergoing a critical period of cognitive, emotional, language, and social growth. Consequently, they require innovative approaches that incorporate these aspects to enhance their learning. Teng (2022) proposed that multimedia input can maintain learners' cognitive engagement by assisting them in selecting relevant information, organizing content into visual or verbal models, and integrating these new models with their prior knowledge.

Therefore, this research aims to assist students in expanding their vocabulary through the utilization of multimedia for vocabulary instruction. To captivate students' attention while encouraging their learning and promoting more effective vocabulary teaching, in his book *Multimedia Learning*, Mayer (2001) argued that offering students both auditory narration and visual imagery allows them to utilize dual-channel processing. This aligns with Zou and Teng's (2023) findings, which show that combining text with picture annotations is more effective than using text-only annotations for enhancing target word learning. This approach enhances students' ability to receive and retain information for longer periods, as it prevents overwhelming a single channel. Consequently, this approach enables students to engage actively in cognitive processing by linking audio lectures with visual presentations, which are considered multimedia tools. Additionally, research on technology-mediated foreign language learning has largely overlooked young learners (Kurt, 2021). Thus, this study aims to fill this gap by implementing multimedia instruction in English vocabulary lessons to enhance the vocabulary knowledge of primary students.

Research Objectives

1. To investigate the impact of multimedia instruction on enhancing the English vocabulary knowledge of primary students.

2. To explore the opinions of primary students regarding the use of multimedia instruction to enhance their English vocabulary knowledge.

Significance of the study

This study shows concrete evidence supporting the effective teaching and learning of English vocabulary by implementing multimedia instruction in the vocabulary lesson, which would benefit both teachers and students at the primary level. Moreover, the research on technology for young learners' language acquisition in foreign language learning is limited. Looking into this research would also be advantageous for researchers in this particular field of study.

In addition, this study will also seek the opinions of the primary students regarding the use of multimedia instruction in enhancing English vocabulary. As a result, it enables teachers to implement suitable pedagogical support that aligns with the needs of the students.

Literature Review

Young Learners and Vocabulary Learning

Vocabulary acquisition is central to all language learning and usage (Kiasi & Gilakjani, 2022). Additionally, Griffin et al. (2021) highlighted that vocabulary is linked to the development of various early literacy skills, such as learning irregular words and making inferences, in young children. Aedo and Millafilo (2022) explain that young learners, aged 3 to 15, exhibit significant differences in their cognitive, emotional, and social characteristics across this broad age range.

There are several challenges in acquiring vocabulary for young learners. Kiasi and Gilakjani (2022) argue that one of the main factors contributing to the failure of vocabulary instruction is the lack of suitable strategies by teachers. This is supported by Hazar (2020), who states that vocabulary expansion can only occur when teachers implement effective teaching methods. Therefore, when teaching young learners, it is essential for educators to develop diverse techniques and activities that encourage students to repeat, recall, and apply vocabulary words and phrases in meaningful contexts, ensuring the transfer of knowledge into long-term memory (Aedo & Millafilo, 2022).

Multimedia and Multimedia Instruction

Multimedia involves the integration of various media types, including text, video, animation, graphics, and audio (Lisnawati, 2021). According to Christine Hughes, multimedia integrates time-based media, including the spoken word, animation, and video, with space-based media, such as text, graphics, and images (Leena, 2020). Additionally, multimedia is considered

one of the effective methods for teaching. Mayer (2014) emphasizes that combining words and pictures in a meaningful way to support learning and education constitutes multimedia instruction.

Multimedia instruction integrates various media formats to support learners' cognitive engagement. Zou and Teng (2023) found that multimedia annotations are more effective than traditional methods in enhancing understanding and vocabulary acquisition.

Moreover, to encourage learning, applying Multimedia lessons by implementing research-based principles (Mayer, 2014) has been found to have a positive result., which will be demonstrated as follows.

1. The Coherence Principle - Learners learn better when unrelated and distracting material is excluded.

2. The Signaling Principle - Learners learn better when the information is emphasized or shown exactly what they have to pay attention on the screen.

3. The Spatial Contiguity Principle - Learners learn better when relevant text and visuals are close to each other.

4. The Temporal Contiguity Principle - Learners learn better when the words and visuals are shown at the same time, instead of in consecutive order.

5. The Personalization Principle - Learners learn better from an informal or conversational voice rather than formal voice.

6. The Voice Principle - Learners learn better when using a human voice rather than a computer voice.

7. The Embodiment Principle - Learners learn better when on screen displays include human-like gesturing, movement, eye contact, and facial expression.

8. The Image Principle - Learners learn better with visuals than with the speaker's face on screen.

In summary, utilizing well-designed multimedia resources for instruction provides learners with suitable and comprehensible input, ensuring meaningful and effective learning in a language classroom designed for specific target learners.

Previous Study

Kurt (2021) investigated how storytelling helps young EFL learners develop speaking skills. In a six-week quasi-experimental study, 30 students in the experimental group used a Web-based multimedia storytelling system, while 29 in the control group used traditional paper-and-pencil methods. The results showed that the experimental group outperformed the control group in speaking skills, had positive attitudes toward Web-based storytelling, and recalled new words more effectively. Similarly, Teng (2022) found that attention to new words enhances vocabulary retention. These studies highlight the benefits of multimedia in EFL learning, particularly in improving vocabulary retention and fostering a positive attitude toward multimedia or technology-related in teaching and learning.

Methodology

1. Research Design

This study utilized a one-group pre-test and post-test research design.

2. Participants

The participants in this study were Primary 5 students, classified as A1 level according to the CEFR standards set by the Ministry of Education of Thailand (2008). A total of twenty students were selected using convenience sampling. The participants' ages ranged from ten to eleven years old and comprised ten males and ten females. The students completed pre- and post-tests to measure the differences in their vocabulary knowledge before and after participating in a specialized vocabulary course that incorporated multimedia instruction. Additionally, eight students were selected for group interviews after completing the specially designed vocabulary lessons. The students were selected based on their post-test results, which included four high achievers and four low achievers.

3. Research Instruments

3.1 Vocabulary Pre-Post Test

To examine the effect of multimedia instruction on improving English vocabulary knowledge, pre- and post-tests were administered before and after the multimedia instruction sessions. The vocabulary test was designed in a multiple-choice format, adapted from the O-NET National Test (Ministry of Education of Thailand, 2024), and consisted of 32 questions based on

vocabulary selected from the words taught in each lesson. The tests were validated by three experts with research backgrounds and over five years of experience in the field of elementary education. After the experts reviewed and validated the test, the scores were calculated. The results indicated that the multiple-choice questions and answers were appropriate, with scores exceeding 0.67, demonstrating that the test effectively assessed the vocabulary competence of the participants.

3.2 Interview Questions

To explore the opinions of Primary 5 students regarding the use of multimedia instruction for enhancing their English vocabulary, interviews were conducted after the completion of the lesson and the post-test. Eight interviewees were selected based on their post-test scores, including four high achievers and four low achievers. The semi-structured interviews lasted approximately ten minutes for each participant and were followed by analysis through thematic analysis. To ensure the quality of the interview questions, the three experts also evaluated them using the Index of Item-Objective Congruence (IOC), yielding content validity scores above 0.67. The interview questions are shown below.

1. How do you feel about learning English vocabulary using multimedia instruction?
2. What are the benefits of learning vocabulary using multimedia instruction?
3. What are the problems or difficulties you find while learning using multimedia instruction?

4. Instruction Instrument

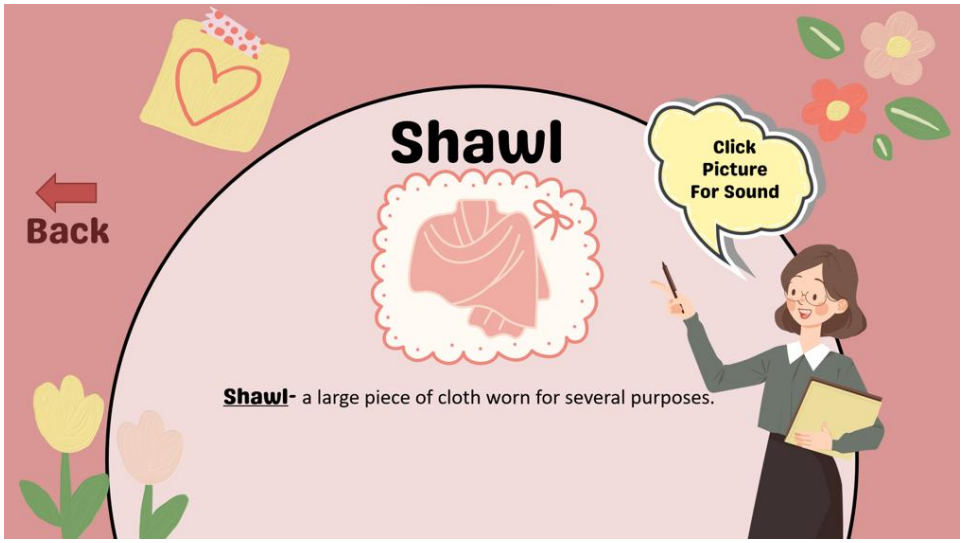
4.1 Contents

The lesson content was adopted from *Oxford Discover Student's Book 1* (Koustaff & Rivers, 2014) and structured into eight Multimedia Instruction sessions designed in accordance with Mayer's (2014) research-based principles for effective Multimedia Instruction. Each 50-minute lesson covered approximately 17 words, focused on age-relevant topics. The researcher served as the instructor, presenting vocabulary at the word level exclusively through multimedia materials to introduce new terms, followed by further explanations. Additionally, brief class exercises were conducted at the end of each session to allow students to practice, with the instructor assisting in clicking and selecting answers on the screen. A short revision session was held at the beginning of the next class to reinforce previously introduced words. The lesson plan,

assessed by the same experts, received a validation score above 0.67. A pilot study indicated that students enjoyed using multimedia tools and found the lessons clearer; however, class time was insufficient for all planned activities. To address this issue, the lesson plan was revised to split the content across two sessions. An example of vocabulary presentation, which include the word and its definition with elaborates on the use of the chosen eight guiding principles is shown here:

Figure 1

Example of vocabulary presentation in Multimedia Instruction design guided by eight selected research-based principles (Mayer, 2014)



1. The Coherence Principle: The content is clearly focused on presenting pictures, vocabulary definitions, and related items with minimal decoration to minimize distractions.

2. The Signaling Principle: The female teacher character signals to listen to the audio, providing a clear indication of where to focus.

3. Spatial contiguity principle: The text that refers to the definition of the term is near the picture of a particular term, which shows the relevant text and visual are close to each other.

4. The Temporal Congruity Principle: The picture of the term and its definition are shown at the same time, which indicates that this works better than being placed in consecutive order.

5. The Personalization Principle: The voice recorded by a teacher who uses an informal or friendly tone.

6. The Voice Principle: The audio is recorded using a teacher's voice instead of the computer voice.

7. The Embodiment Principle: The female teacher character is pointed at the message box, which shows human-like gesturing.

8. The Image Principle: There is only the picture with the female teacher character, and all image items are related to the topic, which does not include a speaker's face on the screen.

5. Data Collection Procedure

After the lesson plans were validated, data collection was conducted with fifth-grade students as participants in the study. The data collection procedure is presented as follows:

Week 1: The pre-test was administered at the start of the week to assess students' vocabulary knowledge, followed by the first multimedia instruction lesson.

Week 1-6: Multimedia instruction was implemented for grade five students over a six-week period, consisting of eight classes in total (50 minutes per class).

Week 6: The post-test was given at the end of week six, matching the pre-test in content and difficulty. Following this, a semi-structured interview was conducted with eight participants (four low achievers and four high achievers) based on their post-test scores.

6. Data Analysis

To address the research questions, both quantitative and qualitative data were analyzed using methods appropriate for each specific instrument type. A paired-samples *t*-test was used to analyze the participants' pre- and post-test results. The quantitative data were processed using SPSS to calculate means and standard deviations.

To analyze the qualitative data, the semi-structured interviews were transcribed and analyzed using the thematic analysis method.

Results

Quantitative data

The quantitative data were processed using SPSS to calculate means and standard deviations. The pre- and post-test scores were analyzed using the pair sample *t*-test. The results are presented in Table 1, Table 2, and Figure 2.

Table 1

Result of pre-test and post-test for English vocabulary knowledge of participants

English Vocabulary Knowledge	*N*	*M*	*SD*	Mean Differences	*t*	*DF*	Sig.
Post-Test	20	13.25	7.64	3.75	2.36	19	0.000**
Pre-Test	20	9.50	6.53				

*****$p < .01$

The results in Table 1 show that the participants' mean score from their post-test is 13.25 (*SD* = 7.64) and the pre-test mean score is 9.50 (*SD* = 6.53). To elaborate clearly, the results indicate that the participants' mean score on the post-test was higher than their mean score on the pre-test at the significant level of P <.01 after the multimedia instruction lessons have been implemented. The total score of both pre- and post-tests is 32. The mean difference is 3.75. The T-value is 2.36. The freedom degree is 19.

Table 2

Raw scores of pre-test and post-test for English vocabulary knowledge of participants

Participant	Pre-Test	Post-Test	Improvement (Post-Pre)
1	9	6	-3
2	4	13	9
3	6	12	6
4	10	18	8
5	8	8	0
6	7	11	4
7	15	23	8
8	6	8	2

Table 2 (Cont.)

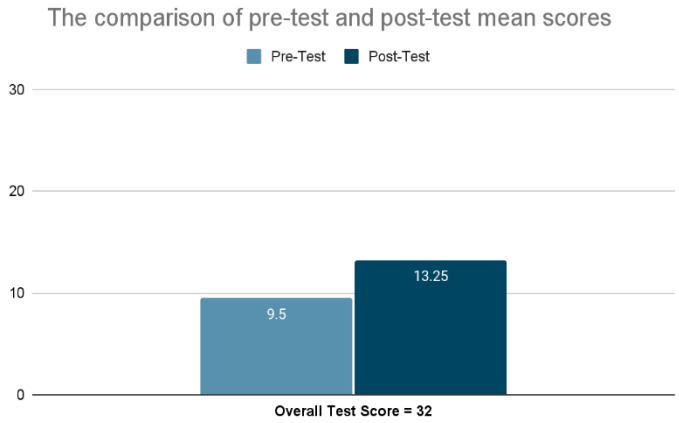
Raw scores of pre-test and post-test for English vocabulary knowledge of participants

Participant	Pre-Test	Post-Test	Improvement (Post-Pre)
9	6	8	2
10	10	8	-2
11	7	7	0
12	6	7	1
13	4	6	2
14	10	18	8
15	2	13	11
16	27	31	4
17	9	15	6
18	6	5	-1
19	12	19	7
20	26	29	3

The results of the raw scores in Table 2 indicate that the participants showed positive improvements in their post-test scores. For example, Participant 15 exhibited the highest improvement with a gain of 11 points (from 2 to 13). However, a few participants (e.g., Participants 1, 10, and 18) did not show improvement or experienced a slight decrease in scores; this will be discussed in the discussion section. Additionally, the mean scores of the participants from the pre-test and post-test are provided below.

Figure 2

Differences between mean scores of pre-test and post-test



As shown in Figure 2, the multimedia instruction was able to enhance student vocabulary knowledge. The post-test mean score was higher than the pre-test score at a mean difference of 3.75.

Qualitative data

The qualitative data were analyzed using thematic analysis of the semi-structured interviews to capture participants' opinions towards the use of multimedia instruction to enhance students' vocabulary knowledge. The researcher used letters and numbers to code the interviewees. For example, H refers to a high performance group, and L refers to a low performance group. There are two main key themes: 1) advantages of using multimedia instruction in teaching and learning vocabulary, and 2) difficulties and limitations of multimedia instruction in teaching and learning vocabulary.

The first theme is "the advantages of using multimedia instruction in teaching and learning". The participants reported that multimedia instruction positively affects the teaching and learning of vocabulary. During group interviews, students highlighted keywords like *fun*, *enjoyable*, *new*, *provides a clear/big picture of the lesson*, and *easy to remember*. In summary, students felt that multimedia instruction is a new and enjoyable learning method that increases their enthusiasm for learning vocabulary. It simplifies the learning process on-screen, allowing students to see a broader view of what they are studying. A key highlight was that many students favored pictures in vocabulary lessons, as they provided clear visual context, improved understanding, enhanced retention, and made learning more engaging.

"It was very new to us. I like learning through multimedia instruction. The learning process is easier on the screen. I can see the big picture of what I'm learning."

(L4, personal communication, June 12, 2024)

"Learning vocabulary using multimedia shows a clear picture on the screen. I don't have to guess its meaning, as the picture shows a very clear meaning of the vocabulary. I just feel that it was automatically understood when I saw the picture on the screen."

(L1, personal communication, June 12, 2024)

However, some of the participants found some difficulties or limitations of using multimedia instruction towards teaching and learning vocabulary. Students reported the background music was extremely loud and the vocabulary pronunciation sounds overlapped. Others, seated in the back row, found it challenging to hear the pronunciation sounds.

"I cannot hear some of the pronunciation sounds clearly. Actually, some of the sound volumes were loud and some were low. The sounds were not on the same level."

(H2, personal communication, June 12, 2024)

Discussions

English vocabulary knowledge

The quantitative data findings indicated that multimedia instruction could significantly enhance students' English vocabulary knowledge. This increase likely resulted from opportunities to practice vocabulary through Multimedia Instruction lessons designed according to the eight guiding principles of Multimedia Instruction (Mayer, 2014). Students were able to perceive and practice the specific effective vocabulary lesson during the Multimedia Instruction. This also aligns with Vraciu and Marsol (2023), who suggest that vocabulary knowledge expands as learners gain more exposure to the target language and advance in their proficiency level. Moreover, Naz (2023) highlighted the findings of the study involving 31 Taiwanese students, which revealed that incorporating pictures and videos facilitates learning new words. They also noted that multimedia helps them absorb and retain more information.

Although the mean post-test scores were significantly higher than the pre-test scores, some participants (e.g., Participants 1, 10, and 18) showed minimal or no improvement. This suggests that while Multimedia Instruction enhances learning overall, it may not fully address deeper challenges in vocabulary acquisition. Factors such as the limited duration of the intervention and variations in students' prior knowledge may have contributed to these outcomes. This align with Griffin et al. (2021), who observed that in certain elementary schools and classrooms, minimal time was allocated daily to direct vocabulary instruction during language learning sessions.

Perception towards the use of multimedia instruction

The study explored the opinion of using Multimedia Instruction to enhance primary students' vocabulary learning. Students expressed positive perceptions, finding it enjoyable, engaging, and effective for simplifying vocabulary learning. This aligns with Naz (2023), who stated that incorporating multimedia in the classroom not only captures students' interest in the lesson but also enhances their comprehension and retention of the content. For instance, one participant noted that Multimedia Instruction provided a "clear picture," making vocabulary easier to understand. These findings align with Immanuel & Hameed (2023) that Multimedia learning takes place when individuals create cognitive representations based on the combination of words and visuals presented to them. These cognitive representations help them understand and remember the information better. Moreover, the results align with Ilham et al. (2023), who found that the diverse formats of multimedia tools, which integrate visual, auditory, and interactive components, accommodate various learning styles, thereby enhancing inclusivity and effectiveness in the learning process. However, challenges such as inconsistent audio levels and loud background music were identified. Addressing these challenges by improving audio quality and classroom setup could further enhance its effectiveness.

In conclusion, the study highlights the strong potential of multimedia instruction to improve vocabulary learning, with students perceiving it as a highly effective and engaging method. However, it is important to consider and address technical limitations to maximize the effectiveness of Multimedia Instruction.

Pedagogical implications

The study demonstrates that Multimedia Instruction significantly improves primary students' English vocabulary knowledge, as shown by higher post-test scores. This study supports Mayer's (2014) eight guiding principles of Multimedia Instruction, showing that multimedia instruction enhances vocabulary learning. Students found the approach engaging, motivating, and enjoyable, leading to increased interest in learning. The use of visuals and graphics enhanced comprehension and memory retention, creating a more effective learning experience. However, challenges such as loud background music and unclear pronunciation from the back row highlight the need for careful planning of the physical environment and resources. In conclusion, the findings suggest that incorporating Multimedia Instruction in language learning can be a valuable pedagogical strategy for improving vocabulary knowledge, enhancing student engagement, and providing a more interactive learning experience.

Recommendations

Limitations of the study

Although the current study shows a notable improvement in students' English vocabulary knowledge, several limitations were noted. One of these limitations is the relatively short duration of the study (six weeks of instruction), which may have influenced the outcomes. Therefore, it is recommended that future studies should extend the instructional duration to achieve further outcomes.

Recommendations for future study

Finally, it is recommended that future studies examine a particular multimedia instructional design prior to lesson planning and ensure that instructors are proficient in the technical aspects of multimedia tools before integrating them into classroom teaching. As this study focused exclusively on primary-level students, further research should involve participants from various educational levels to assess the effectiveness of multimedia instruction across a broader range of student populations. Lastly, although this research concentrated on vocabulary acquisition, future studies should explore the effects of multimedia instruction on other English language skills, such as speaking, listening, reading, and writing.

References

Aedo, P., & Millafilo, C. (2022). Increasing vocabulary acquisition and retention in EFL young learners through the use of multimodal texts (Memes). *Colombian Applied Linguistics Journal*, *24*(2). https://doi.org/10.14483/22487085.18312

Binhomran, K., & Altalhab, S. (2021). The impact of implementing augmented reality to enhance the vocabulary of young EFL learners. *The JALT CALL Journal*, *17*(1), 23–44. https://doi.org/10.29140/jaltcall.v17n1.304

Leena A. (2020). Triggering comprehensible input through multimedia: A support to enhance learning experience in the ESL classroom. *Journal of English Language Teachers' Interaction Forum, 11*(9), 27–30. https://www.eltif.in/journal.html

Griffin, N. M., Elleman, A. M., & Oslund, E. L. (2021). The impact of growth mindset instruction on the vocabulary acquisition and comprehension of first grade students. *Reading Psychology*, *42*(7), 758–776. https://doi.org/10.1080/02702711.2021.1939821

Hazar, E. (2020). Use of digital games in teaching vocabulary to young learners. *Educatia 21*, *19*, https://doi.org/10.24193/ed21.2020.19.12

Ilham, M., Rahman, F., Sari, D. D., & Annisaturrahmi, A. (2023). Enhancing preschool English vocabulary through multimedia tools: Insights from a mixed-methods study. *Deleted Journal*, *9*(2), 93–102. https://doi.org/10.14421/al-athfal.2023.92-02

Immanuel, J., & Hameed, M. S. (2023). Cognitive theory of multimedia learning powered code-switching interface for vocabulary acquisition of ESL students. *Journal of Language Teaching and Research*, *14*(6), 1439–1448. https://doi.org/10.17507/jltr.1406.01

Kiasi, G. A., & Gilakjani, A. P. (2022). The effects of definitional, sentential, and textual vocabulary learning strategies on Iranian EFL learners' vocabulary learning and retention. *Reading & Writing Quarterly*, *39*(2), 155–172. https://doi.org/10.1080/10573569.2022.2073575

Koustaff, M., & Rivers, S. (2014). *Oxford discover student book 1*. Oxford University Press.

Kurt, G. (2021). Technology-mediated tasks in the young learners' EFL classroom. *Ilkogretim Online-Elementary Education Online, 20*(1), 327–340. https://doi.org/10.17051/ilkonline.2021.01.031

Lisnawati, I. (2021). Speaking learning based on multimedia. *Journal of Language and Linguistic Studies, 17*(4), 2046-2056. https://www.jlls.org/index.php/jlls

Mayer, R. E. (2001). Multimedia learning. Cambridge University Press.

_____. (2014). Research-based principles for designing multimedia instruction. In V. A. Benassi, C. E. Overson, & C. M. Hakala (Eds.), *Applying science of learning in education: Infusing psychological science into the curriculum* (pp. 59–70). Society for the Teaching of Psychology.

_____. (2014). *Talking multimedia learning with Dr. Richard Mayer* [Video]. YouTube. https://www.youtube.com/watch?v=Q5eY9k3v4mE

Ministry of Education of Thailand. (2008). *Basic education core curriculum B.E. 2551 (A.D. 2008)*. Ministry of Education of Thailand.

_____. (2024). *O-NET: Ordinary national educational test*. Ministry of Education of Thailand. Retrieved from https://www.niets.or.th/

Naz, S. (2023). Role of multimedia-aided EFL classrooms in promoting learners' interaction and participation in tertiary-level Bangladeshi students. *Journal of Language Teaching and Research*, *14*(5), 1207–1214. https://doi.org/10.17507/jltr.1405.08

Teng, M. F. (2022). The effectiveness of multimedia input on vocabulary learning and retention. *Innovation in Language Learning and Teaching*, *17*(3), 738–754. https://doi.org/10.1080/17501229.2022.2131791

Vraciu, A., & Marsol, A. (2023). Content-specific vocabulary in CLIL: Exploring L2 learning outcomes in a primary education programme in Catalonia. *Language Teaching Research*, *27*(5), 767–789. https://doi.org/10.1177/13621688231170073

Zou, D., & Teng, M. F. (2023). Effects of tasks and multimedia annotations on vocabulary learning. *System*, *115*, Article 103050. https://doi.org/10.1016/j.system.2023.103050