Developing Primary School Teachers' English Vocabulary Teaching Using Online Multimedia-Based Instruction

Rapeepat So-In[1], Walaiporn Chaya[2]

[1]English Instructor, Faculty of Liberal Arts, Southeast Bangkok University
[2]English Instructor, Faculty of Liberal Arts, Southeast Bangkok University

ABSTRACT

English vocabulary is very crucial for a second or foreign language learner taking into account that a student's ability to communicate in English depends on a total number of words they know. According to the results of previous studies, teaching English vocabulary to young students in primary schools may be facilitated by utilizing online game-based and multimedia-based learning that provides a 21st-century learning environment. However, there is little evidence to support the effectiveness of these two vocabulary teaching methods in EFL Thai context. As a result, this study sought to upper English elementary teachers' satisfaction with vocabulary teaching training through Online Multimedia-Based Vocabulary Instruction for enhancing English vocabulary learning. It also looked at the effectiveness of vocabulary teaching strategies on the sixth-grade students' vocabulary learning in a primary school and their attitude towards the use of Online Multimedia-Based Vocabulary Instruction. The research was a quasi-experimental research with a pretest-posttest control group design and used a mixed-methods approach. Two classes, totally 60 grade six students were selected from three classes, and 30 students were randomly assigned in the experimental group learning through Online Multimedia-Based Vocabulary Instruction, and 30 students in the control group learning by Traditional-Based Vocabulary Instruction. The results showed that teachers' satisfaction with the vocabulary teaching strategies training was very high. Most of teachers perceived the training as a powerful tool for enhancing grade six students' vocabulary. Statistically significant difference was not found between the English vocabulary posttest of the experimental group and control group, but the experimental group had the positive attitude towards vocabulary learning. The findings implied that Online Multimedia-Based Vocabulary Instruction is an effective technique for developing students' English vocabulary, specifically at the primary school level. This teaching technique could be applied to the EFL English classroom so that students become achieve their learning goal.

Keywords: Vocabulary teaching training, Online Multimedia-Based Vocabulary Instruction, Primary school teachers, Student attitude, Grade six students

INTRODUCTION

With the advancement of science and technology, the emergence and development of multimedia technology as well as information technology has resulted in technological innovations along with the growth of the English language. This has also brought changes in the way people communicate across

the world. English is one of the global languages the majority of people living around the world communicate. Additionally, the growth of information technology has culminated in the development of various communication channels worldwide. This includes phone calls, texts, emails, videos, radio, social media, etc. It is asserted that the growing popularity of the multimedia has facilitated the growth of the English language to a large extent (Pandey, 2014). In this instance, there is a growing demand for NNS (Non-Native Speakers) to learn English globally Multimedia technology allows NNS to learn English from anywhere in the world through a variety of communication means including web-based learning, online learning, and distant learning, and so on. It is evident that English is extensively used worldwide, and it frequently serves as a vital international tool for people in a variety of contexts, including academics, economists, medical professionals, and those who regularly work in organizations. As a result of these paradigm shifts, there has been research on the use of multimedia technology in teaching and learning English in non-native countries such as China, Japan, Korea, Indonesia, Iran and Thailand. Multimedia technology has been shown to promote activities and initiatives and activities in English teaching and learning. Zhen (2016) asserted that teaching English with multimedia is highly beneficial. Teachers and students both benefit from multimedia. In order to accomplish learning objectives, teachers should integrate multimedia into their English classes and students may also study through multimedia at the same time. Pun (2013) claims that nowadays integrating multimedia technology in English classes is simple for all of us. Hence, it makes sense for language teachers to integrate it into their lesson and assessment plans, just as they do with videos. In support of this consideration, today, students are surrounded by technology, and as "the use of technology for teaching and learning is moving their institutions in the right direction. The so-called, the information-based society of the twenty-first century, as defined by Reinders and Wattana (2012), is a modern, technologically advanced society. Digital technology has been acknowledged as having the ability to draw students' attention and encourage communication in the target language. According to Brown (2000), technology like computers, movies, and videos can be used. One teaching method that combines interactive multimedia with computer-assisted education is called Computer-Based Interactive Multimedia (CBIM), and it supports students in developing communication competence.

In Thailand, Thai students learn English as a foreign language (EFL), and it is a compulsory course for Thai students at any educational level. English is included in the national curriculum from elementary level through university. In deed, the main goals are to develop listening, reading, speaking, and writing English skills, ensuring good attitudes towards the use of English and be able to communicate in English in various contexts, gain knowledge, use English in the workplace and continue their studies (Ministry of Education, 2008). Additionally, Thai students must be able to develop their ability to communicate meaningfully with the fundamental language principles of listening, speaking, reading, writing as well as fully understand cultural aspects of global English. As a consequence, to fulfill the goals of teaching and learning the English language, teachers must teach by integrating all four languaue skills, and four language components that support language skills such as grammar, vocabulary, spelling, and pronunciation are also taught in the English teaching and learning process.

Among those components, vocabulary is an indispensable part of the four-language skills. It is a crucial component that supports listening, reading, speaking, and writing skills for learning English as a second language learning (ESL) and a foreign language learning (EFL). According to Schmitt (2010) "Very little can be expressed without grammar, and nothing can be expressed without vocabulary."(p.3) Additionally, Lessard-Clouston (2013) asserted that without a sufficient vocabulary, students are unable

to understand others or express their own thoughts. In line with Laufer's (1998) claim that vocabulary learning is the foundation of language learning and language use. It is what makes up the essence of a language. Speakers in a language are unable to communicate or interact with one another. McCarthy (1997) maintains that vocabulary is still regarded as the the first priority component in foreign language communication as it is just as important to academic success (Krashen & Terrel, 2000) no less than grammar or culture of the native English speakers.

Nevertheless, learning a foreign language is not always easy for EFL students, especially when it comes to vocabulary. In fact, vocabulary helps in the growth and mastery of the four fundamental skills. Vocabulary is defined as words or a list of words that individual speakers of a certain language could speak. In the vocabulary learning process, ones usually follow a set pattern they learn new words, understand their meanings in their mother tongues, decide how to use them in other context, and finally use the same words in their everyday lives (Tebeweka, 2021). That is, students cannot speak or communicate without vocabulary.

Furthermore, the effectiveness of vocabulary teaching and learning has long been far from satisfying. And research revealed that the vocabulary level of primary school students, particularly in EFL learners, is not satisfactory at present. Therefore, it is the responsibility of the language teachers to find out interesting and attractive ways to teach and motivate their students because the young children, as young learners, they get bored very fast if the teacher is teaching them using the old conventional methods and techniques (Bakhsh, 2016). According to Bakhsh, teaching young learners is very complicated compared with teaching teenagers or adults because young learners get distracted very fast. Children love to have fun and play, so teachers should choose suitable teaching methods that cater to children's nature. Children who are exposed to a large number of English vocabularies from a young age are expected to be able to communicate effectively, and this learning process can be enhanced by the use of multimedia (Rohim & Yulinda, 2014).

For decades, learning English vocabulary is problematic for both ESL and EFL learners, particularly for young students at the primary school level. Many previous studies suggested that vocabulary is one of the difficulties for EFL leaners since it is not their native language (Rakangthong & Yimwilai, 2020). The findings of these studies also indicated that EFL learners have less exposure to the English language and less opportunities to use it in everyday life. Moreover, the main problem is lack of vocabulary knowledge which hinders the ability to communication in English (Ahmadi, et al., Abdullah, 2012). According to Salimi and Zangeh (2022) learning vocabulary is a complicated , repetitive process that requires students to continuously repeat the words while also learning more vocabulary and appropriately using them in sentences in a variety of contexts. Additionally, they must be aware of synonyms and other meanings. Hence, the students face certain difficulties throughout the vocabulary learning process. Haddad (2016) confirmed that EFL students lack awareness of the significance of vocabulary learning. They don't have much experience using the target language in regular practice. Therefore, one of the most challenging tasks for EFL teachers is to encourage students to learn English and create a vocabulary-rich atmosphere. Thai EFL students have difficulty learning vocabulary that is comparable to those of other students encountered in the EFL context. Thancharoenphanit (2013) found that they had limited knowledge of English vocabulary, which affected their foreign language communication. Thai students frequently feel bored learning English due to a lack of vocabulary. When they start learning , and then give up because of vocabulary; they become lazy to learn, especially when inappropriate teaching methods are used. Additionally, the findings of qualitative study revealed that

some students thought typical teacher-centered and text-based instruction made vocabulary quite uninteresting. Consequently, there is an urgent need to develop Thai EFL students' English vocabulary knowledge, and new teaching techniques must be explored to enhance Thai students' mastery of English vocabulary.

For English teachers in primary schools, vocabulary teaching is one of the most difficult parts for many teachers since it is often considered a boring and repetitive process. They spent most of the class time explaining grammatical rules or doing pattern practice and teach few vocabulary learning strategies to their students. They explained new words one by one without any relation to the context or textbook content (Han and Wei 2016). Many English teachers in primary schools still dominate the classroom and spend little time fostering students' thinking ability and creativity. According to recent studies, there might be difficulties while teaching vocabulary because many teachers are uncertain of the most effective methods to do so. Additionally, sometimes they don't know where to start focusing on teaching vocabulary (Binmudnee, et. al.,2021). Consequenly, new teaching techniques must be explored to stimulate their students' learning motivation and interest and to enhance Thai students' mastery of English vocabulary.

Among the aforementioned problems that EFL students and teachers encounter throughout vocabulary teaching and the learning process, technological innovations are considered to be useful solutions. Several studies have shown that using technology, such as computers or mobile phones, and courseware improves vocabulary acquisition. Moreover, compared to "traditional-based approach" or learning materials that do not integrate multimedia, computer-based multimedia can enhance vocabulary learning and retention of materials presented during class or individual study sessions (Gonen, 2018). Similarly, Taj et al., (2017) found that students' performance in vocabulary increased when learning was supported by technological media such as online learning through computers or mobile phones. To encourage the students to be positive and eager to learn and get acquainted with vocabulary, teachers must make the learning process more interesting, enjoyable and practical. Learning English vocabulary with multimedia is one of the alternative teaching that can be done. Indeed, multimedia is the integration of sounds, words, sounds, pictures, graphics, and text, all of which can facilitate and entertain students in learning English vocabulary. Additionally, students can access online multimedia websites to practice vocabulary exercises as supplementary materials through their personal computers, smartphones, or even laptops whenever and wherever they want to help them learn and remember vocabulary.Thus, there is an increased interest and positive attitude in English learning (Mthethwa, 2018).

STATEMENT OF THE PROBLEM

Realizing the importance of using multimedia in language teaching, computers and smartphones have become very popular in schools. This current study attempted to investigate the effectiveness of Online Multimedia-Based Vocabulary Instruction for developing the sixth-grade students' English vocabulary learning in a primary school in Samut Prakarn province. From the needs of alternative learning and teaching methods and the limitations of producing teaching and learning materials of the primary school teachers, this brings us teachers-researchers to investigate the way to help develop primary school teachers' English vocabulary instruction using online multimedia carried out in Klong Samrong School. This present study also intended to find out if this alternative teaching technique with technology integrated would help increase and supplement the primary school student's knowledge, transfer, and

retention of vocabulary. More importantly, it is encouraging if the proper combination of multimedia and teaching methods may attract Thai EFL students' attention during English language learning.

RESEARCH OBJECTIVES

This study addressed four main objectives as follows:

1. To explore the level of satisfaction of upper English elementary teachers towards the Online Multimedia-based Vocabulary Instruction for improving the English vocabulary learning of the sixth-grade students.
2. To determine the effects of Online Multimedia-based Vocabulary Instruction for developing the sixth-grade students' English vocabulary learning in a primary school.
3. To examine the effectiveness of Online Multimedia-based Vocabulary Instruction for developing the sixth-grade students' English vocabulary learning in a primary school.
4. To explore the attitude towards the use of Online Multimedia-based vocabulary Instruction for developing English vocabulary learning of the sixth-grade students in a primary school.

RESEARCH QUESTIONS

The research questions of this study were:

1. What is the level of satisfaction of upper English elementary teachers towards the Online Multimedia-based Vocabulary Instruction for improving the English vocabulary for the sixth- grade students' English vocabulary learning in a primary school, in Samutprakarn Province?
2. Is Online Multimedia-based Vocabulary Instruction effective for developing the sixth-grade students' English vocabulary learning in a primary school in Samutprakarn Province?
3. Are there any significant differences in English vocabulary achievement scores between the sixth-grade students learning through Online Multimedia-based Vocabulary Instruction and those those learning through the Traditional-based Vocabulary Instruction?
4. What are the sixth-grade students' attitudes toward learning English vocabulary through Online Multimedia-based Vocabulary Instruction?

REVIEW OF RELATED LITERATURE

The Importance of Vocabulary Teaching and Learning

The importance of vocabulary is documented by many theorists and researchers in ESL and EFL teaching and learning (e.g. Alqahtani, 2015, Zahedia & Abdib, 2012, Zimmerman, 2007). They all agree that vocabulary plays a critical role in research, language teaching and learning, and classroom practice. It is also fundamental to language and crucial for language learners. Language structures could not exist without words. Vocabulary knowledge is often viewed as an essential tool for second and foreign language learners because a limited vocabulary hinders successful communication. Additionally, Nation (2011) highlights the relationship between vocabulary knowledge and language use, stating that complementary vocabulary knowledge facilitates language use, while language use enhances vocabulary knowledge. Similarly, Hazar (2020) emphasizes that vocabulary is a crucial component of language skills, enabling language use and increasing vocabulary knowledge and word understanding. Vocabulary is specifically essential for English as a Foreign Language (EFL) learning, as it aids in acquiring listening, speaking, reading, and writing skills. According to Nation (2013), vocabulary is one key component that connects to those four skills of English and having an adequate number of vocabularies

enables students to effectively express their thoughts and understand others. It would be difficult to produce or comprehend language without vocabulary knowledge. As a result, expanding one's vocabulary is a requirement for learning a language, and this can only be possible when teachers use effective vocabulary teaching (Mukoroli, 2011). Teachers should help students learn the basic steps and how to access and acquire, recognize and remember, and activate and generate new word meanings to maximize vocabulary development. Consequently, numerous approaches, techniques, exercises, and practices have been introduced into the field of teaching vocabulary (Schmitt, 2000).

Harmer (2007) highlights that young children learn differently than older children, adolescents, and adults due to mood changes and higher motivation. Teaching vocabulary to younger students differs from adults due to their unique needs, competencies, and cognitive skills. The author claims that their particular characteristics become the main consideration in treating them differently when teaching vocabulary. In line with Wahid, et al. (2021), the authors pointed that early instruction in English vocabulary recognition should be given to children as part of their school curriculum. Early life is the best time to remove anything since it may be done quickly and simply. The theory behind language is that children may learn a foreign language more quickly and easily than adults if they start learning it at a young age. This was supported by research on non-native English speakers, which showed that vocabulary development in the early school years had a significant influence on children reading comprehension in later school years (Manyak & Bauer, 2009). In this case the English teacher should be more creative in selecting activities in learning process; they should provide a great variety of interesting activities and exercises when teaching young learners. As a result, using games, songs, and humor in teaching vocabulary and unfamiliar words is thus more effective in helping those students in learning (Harmer, 2008).   .

The Definition of Multimedia

Literally, multimedia is a form of communication that combines multiple content formats, including text, audio, pictures, animations, or video, into a single interactive presentation. Whereas previous mass media, such printed materials or audio recordings, included little to no interaction for users. (www.wikipedia.com). According to Yang (1998), "multimedia" refers to most computer applications that include text and other digital materials. In Mayer'(2005) multimedia learning theory, multimedia is referred to as presenting words as spoken and/or printed text, and pictures such as illustration, photos, animation, or video. Mayer (1997) proposes three components of multimedia which promote effective learning. The first is the multimedia principle which suggests that information processing occurs across aural and visual channels, with students learning more effectively from words and visuals combined. The second is that each channel has limited information processing capacity, and the third is an active process of information filtering, selection, organization, and integration. Gilakjani (2012) defines multimedia as the use of multiple formats of media in a presentation. Multimedia comprises a computer program that combines text with at least one of the following elements: music, video, pictures, 3-D graphics, animation, high-resolution images, and audio or sophisticated sound (p.58). According to Pandey (2014), multimedia presents information through text, graphics, images, audio, and video, creating a complex multi-sensory experience for exploring our world. Evidence suggests that combining words and pictures increases people's ability to integrate a lot of information. Thamarana (2016) defines multimedia as the integration of many content formats, such as text, audio, photos, animation, video, and interactive information. It can be a part of a live performance, although it is typically recorded and

played, or accessed by information processing devices, such as computerized and electronic devices. The definition provided by Katemba (2022), "multimedia is any interactive program or mediated software that incorporates text, color, graphical graphics, animations, and any combination of audio and visual effects." The author fruther recommends how instructors can use multimedia learning as a tool for instruction to create and implement effective teaching and learning activities in the classroom.

All in all, multimedia is a type of technology which combines the use of various media forms in presentations, including graphics, audio, video, or movies, and includes elements other than plain text.videos. Since the media can be integrated by using computer, and multimedia learning refers to a learning environment that includes both words and pictures to promote learning, such as an illustrated textbooks, narrative slide presentation, online lecture, animation and online computer games.

Components of Multimedia

Multimedia consists of various components: text, graphics, animation, sound, and video. These components can contribute differentially to the learning material**.** Zhen (2016) lists the components of multimedia as follows. 1) Text is fundamental element in all multimedia applications. 2) Graphics refers to images and pictures, such as chart, diagram, and photograph. 3) Animation is the rapid display of a sequence of images or model positions in order to create an illusion of movement. By the use of animation, teachers can highlight key knowledge points and heighten students' motivation.Graphics plays a very important role in to create an illusion of movement. By the use of animation, teachers can highlight key knowledge points and heighten students' motivation. 4) Sound includes speech, music, or any other sound that is stored and produced by computers; 5) Video is the visible part of a television transmission and broadcasts visual images of stationary or moving objects. Figure 1 illustrates the basic components of multimedia learning.
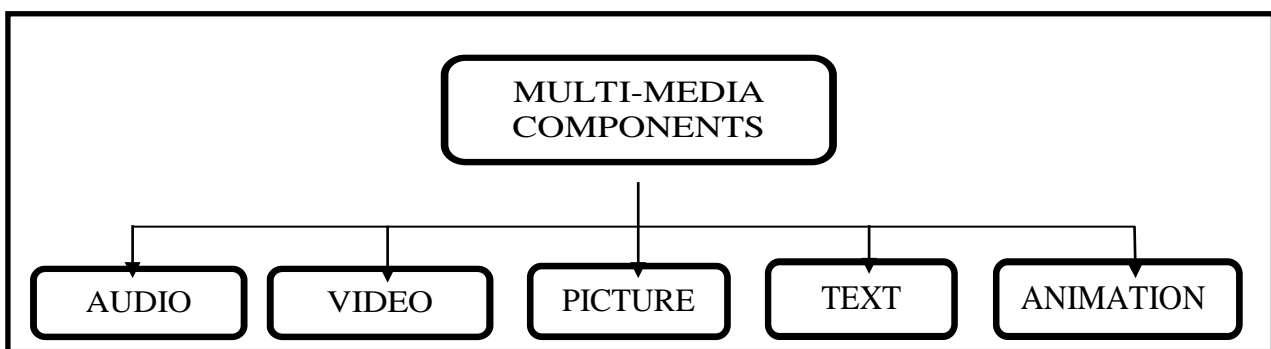

Figure 1: The Basic Elements of Multimedia Learning Environment

The Role of Multimedia in Teaching and Learning English

Several works of literature discuss the role of multimedia technology plays in teaching and learning English, particularly vocabulary. Most of studies have come to the conclusion that multimedia play a positive role in language teaching and learning, espepcily EFL learners. (He, 2021, Ganapathy & Seetharam, 2016), 2016, Zhen, 2016, Pandey, 2014). According to He (2021), technology plays an essential role in both the teaching and learning process in every aspect of life. Students who use multimedia in the classroom are more engaged and motivated to learn English. Motivation is a key element that affects students in learning a subject well. (p.10). Mthethwa (2018) claimed that teaching

vocabulary using a combination of text, sound, graphics, video, or animation is becoming prevalent in language learning. It will facilitate students to learn vocabulary in a fun way. The investigation by Ganapathy and Seetharam (2016) also revealed that multimedia approach promotes students' motivation in learning English. The study supported the notion that students' perception of multimedia lessons in ESL classroom as extremely stimulating, learner-centered, and self-directed, and that they encourage them to make meaning with little assistance from the teachers.

Additionally, for teachers using multimedia in English language teaching can stimulate students in the respective important function area and enable them to engage in a variety of sensory organs in the learning process. This stimulation differs from traditional English teaching methods by promoting information understanding and information retention, improving learning outcomes and increase efficiency in the classroom. With the use of multimedia English teaching, students can adapt and change their perspectives from traditional classroom, which improves the quality of all elements of their studies and therefore enhancing the quality of all aspects (Zhen, 2016). According to Pandey (2014), multimedia learning can accelerate the process of discovering information and give students access to a multiplicity of resources for learning English. Moreover, the vast amount of information available on the internet can provide us with some relevant knowledge. Teachers who need to update their teaching materials are fond of multimedia since it provides up-to-date information from the internet.

He (2021) highlights the important role of multimedia in and in English language acquisition by comparing to raditional methods, such as translation or memorization lists. While multimedia provides both visual and aural input for students which are the key process of vocabulary acquisition. Traditional method can be boring and hinder meaningful learning, as students struggle to remember all new English words. Vocabulary is also the most crucial component in EFL learning. The students are required to remember several new words learned in class. By integrating multimedia in the English classes, the motivation and learning interest of students in the English language may be increased. This can be an effective teaching strategy for engaging non-native English speakers in language learning. To achieve this goal, the language teachers should create a friendly environment for teaching English (Kharbe, 2019).

As discussed above, it proved how multimedia technology plays a positive role in promoting activities and initiatives of students while having a good impact on learning in English classes. The integration of multimedia technology is used in foreign language teaching, an interactive learning environment with excellent sounds, pictures, graphics, and color can be created. This can make students feel more innovative about teaching and become more interested and actively learn foreign languages. As a result, multimedia technology may assist in accomplishing the ideal of "learning" and "teaching" by offering a variety of authentic information resources, fostering a positive learning environment, and enhancing the cognitive growth of students (Dawson, 2023).

Theoretical Basis of Multimedia Language Teaching and

Multimedia learning is connected to a number of theories: Constructivism, Krashen's Comprehensible Input Hypothesis, and the Mayer's Cognitive Theory of Multimedia Learning.

Constructivism

Constructivism emphasized the importance of the students' active engagement in their studies. Two approaches of constructivism usually discussed include social constructivism and cognitive

constructivism. According to cognitive constructivism, knowledge refers to restructuring and reorganizing the experience. Knowledge should be acquired by students through experience and discovery rather than being simply transmtted to the students. Social constructivism considers learning to be a process of interaction and collaboration among students or between students and teachers. It places a strong emphasis on students' active engagement in the learning process, the importance of knowledge learning through personal experiences rather than having teachets spoon-feed them knowledge and and interaction between students and teachers. The function of the education system is to create an environment in which students can reconstruct their knowledge through relating their prior knowledge with newly acquired knowledge. It suggests that learning is a social-dialogistic process, where knowledge is acquired through others' help and suitable learning material (Duffy & Cunningham, 1996). Teachers should incorporate new and effective modes, ways, and designing thoughts into multimedia teaching practice to foster more effective learning environment (Nunan, 1999). In addition to teaching, knowledge may also be acquired with the assistance of others and appropriate constructivist learning materials within certain social and cultural environments. Therefore, in teaching vocabulary teachers should incorporate innovative and efficient methods, techniques, and design ideas into their multimedia teaching practices to engage students' interest in learning new words (Gilakjan, 2012, p.60)

Krashen's Comprehensible Input Hypothesis
Krashen's Comprehensible Input Hypothesis suggests multimedia tools enhance Second Language Acquisition (SLA) by combining audio and visual input, influenced by social and psychological factors (Krashen, 1989). Krashen claims that comprehensible input significantly contributes to language acquisition, as it promotes understanding of messages slightly beyond learners' current knowledge, thereby fostering language growth. Comprehensible input in English is English language that ones can understand. English input includes written and spoken language, such as books, articles, English blog posts, radio shows, podcasts, and conversations. In order to ensure language learners' attention, the input should be interesting. Krashen emphasized the importance of comprehensible input for effective learning, stating that learners' attention is crucial for effective learning. This theory suggests that comprehensive input is the most effective method for enhancing spelling and vocabulary, (pp.440–463), as students lacking sufficient vocabulary often struggle with effective communication. Recent studies (Krashen, 1989; Ray, 2014 cited in Kiymazarsian, 2020), maintain that the growing importance of teaching vocabulary through comprehensible input, both within and outside the classroom, and how it can help students in their vocabulary development. In addition to the methods, models, and methods that have emerged as a result of various theories of language and language learning, significant improvements in L2 vocabulary teaching and learning have also been brought about by recent advancements in information technology .

The Cognitive Theory of Multimedia Learning
The Cognitive Theory of Multimedia Learning (CTML) was initially proposed by Mayer (2001), and Mayer and Chandler (2001) which contends that learning through multimedia improves an individual's brain's functioning. According to Mayer (2005), by including a dimension of learning, multimedia-based techniques can be applied with little disruption in most classroom contexts. The fundamental principle of multimedia learning is that when words, pictures, and visuals are used together, learners may learn more thoroughly than when words are used alone. One of the primary goals of multimedia learning is to

encourage students to create a coherent mental image of the content they are provided. As an active participant, students must make meaning of the material presented, leading to the construction of new knowledge (Mayer,et al., 2003). Mayer (2009) argues that learning from words and images becomes meaningful when a student uses five cognitive processes. These include *selecting* relevant words for processing in verbal working memory as well as relevant images for processing in visual working memory, *organizing* selected words into a verbal model as well as selected images into a pictorial model and finally *integrating* the verbal and pictorial representations with each other and with prior knowledge). The idea that humans have separate visual and verbal information processing systems is represented by having a visual system on the top row and a verbal system on the bottom row. The idea that each system has limited capacity is represented by placing parts of each system under the `working memory. The cognitive process of selecting is represented by the arrow from pictures to images (and from words to sounds); the cognitive process of *organizing* is represented by the arrow from images to visual. Figure 2 presents Mayer's cognitive model of multimedia learning.
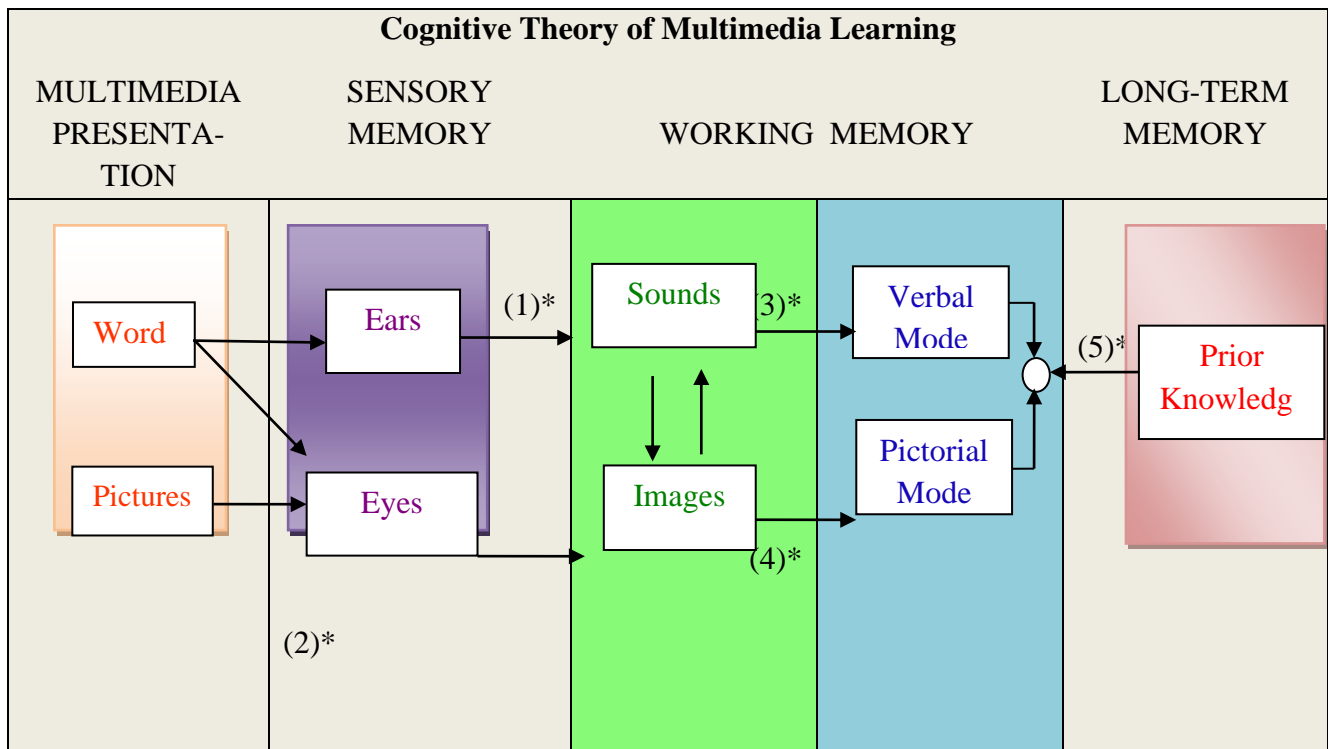

Figure 4: Mayer's Cognitive Theory of Multimedia Learning

Source: McGraw Hill Education

Note (1)* *Selecting words*   (2)* *Selecting images*   (3)* *Organizing words*
        (4)* *Organizing images* (5)* *Integrating*

RELATED STUDIES ON MULTIMEDIA-BASED VOCABULARY LEARNING

Several studies have been conducted in the area of teaching and learning English, with a particular emphasis on vocabulary instruction. Similarly, many scholars believed that the most important thing in learning any language, particularly in EFL context is mastering vocabulary. The main objective of the current study was to examine the effectiveness of Online Multimedia-based Vocabulary Instruction on the sixth grade students in a primary school since the findings of the previous studies showed the con-

sistent positive results for the use of multimedia enhancement in vocabulary. In other words, the study showed a significant improvement in the students' vocabulary learning. In one study, Teng (2022) examined the impact of multimedia input on vocabulary learning in Chinese-speaking university students. Four input conditions were assessed: definition + word information + video, definition + word information + audio, definition + word information, and definition-only. Results showed that multimedia input significant effect vocabulary learning in Chinese-speaking university students, particularly in the definition + word information + video condition. Combining video clips with written descriptions and background information was found to be more successful in learning new vocabulary than audio recordings alone. Interview data revealed positive attitudes towards the definition + word information + video mode, with a higher percentage enjoying vocabulary learning practice due to deeper understanding and retention of vocabulary knowledge. Katemba's (2022) found that multimedia learning significantly impacts vocabulary growth in Grade VII EFL students in Indonesia. Ninety-three participants were divided into three groups: educational videos, online games, and traditional methods. It was found that the use of educational online games resulted in higher achievement than the educational videos and conventional teaching. These findings imply that vocabulary growth is significantly impacted by multimedia learning. Further study by He (2021) investigated the impact of multimedia in primary English classes in China, focusing on its potential to help students retain interest in learning English. The results indicated that multimedia tends to maintain students' interests, increase vocabulary acquisition, facilitates reading ability of students, and improve students' listening skills. Multimedia is considered to be good to be implemented for English learning. Therefore, schools or educational institutions are expected to provide teachers with opportunities of training with the use of multimedia. In this case, teachers are encouraged to use multimedia to enhance teaching and learning practice. A study was conducted by Marpaung and Situmeang's (2020) to compare vocabulary learning among 10th-grade senior high school students in Indonesia. Two classes were divided into two groups: one using authentic materials through multimedia, and the other using authentic materials. The instruments used in this study were the vocabulary test and questionnaire. The results showed that the students' vocabulary enhancement for both classes was increased after the treatment. This implied that the use of authentic materials through multimedia is very effective to enhance students' vocabulary knowledge.

In conclusion, studies on primary EFL classrooms showed that multimedia-based instruction improves vocabulary learning by providing animation, sound effects, and motivation. It is recommended that more teachers integrate multimedia games, online games, or teaching devices as classroom interventions to enhance vocabulary learning.

Researches in Thai EFL contexts were also corresponded with the findings of studies conducted with non-native English speaking students. For example, a study by Binmudnee et.al. (2021) examined the effectiveness of an English vocabulary application on Android operating systems with 200 primary school students in the five southern border provinces. The study also aimed to compare student achievment before and after using the application and to evaluate and follow up on its usage by stakeholders. The research instruments were an English vocabulary application, an achievement test, and an evaluation form of the stakeholders. The results showed that the application increased students' English vocabulary knowledge by 24%, and their satisfaction with the application was high at 4.51 (90.37%), indicating a "very good" level of satisfaction. In the other study, Rakangthong and Yimwilai (2020) investigated the effect of digital game resources on English as a Foreign Language (EFL) students' vocabulary knowledge. The study involved 70 students from Science-Math and Chinese-

English programs. Data were collected using the vocabulary test and questionnaire to find out the students' satisfaction on learning vocabulary through online games. Results showed significant improvements in vocabulary knowledge, with students favoring digital game resources. The study suggested that digital game resources can be effective tools for enhancing EFL students' vocabulary skills. In a quasi-experimental study Kongprab (2018) examined the effect of digital-game-based learning on vocabulary gain, retention, and motivation in Thai upper primary school students. The sample groups were sixty students a primary school in Phattalung province, the southern of Thailand. The experimental group received digital game-based learning, whereas the control group received non-digital game-based learning. The results showed no significant difference in vocabulary retention or motivation between the two groups. Both groups had positive perceptions of digital game-based learning, with the experimental group being more impressed with its practical application. In another stydt Klentien and Kamnungwut (2015) examined the effect of electronic media teaching on Thai elementary and secondary students. The sample was 100 students selected from 4,000 using a random sampling method. The software program was designed to help students learned vocabulary form sentences more effectively. The findings indicated that the students increased in the number of known vocabulary, and the number of studied sentences, while the variables correlated with high proficiency score. The students were satisfied with the program in all aspects including learning activities in the lessons and website, contents, and teaching techniques respectively.

In summary, not many studies were conducted on the use of multimedia with primary-level Thai students. To help students learn more successfully, some researchers have developed their own software for English classrooms, while other studies have created new teaching methods to be used in conjunction with text-based education, school-based learning, or conventional methods. As most of elementary schools, whether in larger cities or other provinces, lack of support for technological things.

RESEARCH METHODOLOGY

Participants and Context

This study was a quasi-experimental research with a pretest-posttest control group design. Phase 1 was teacher training aiming at training upper elementary school teachers in Online Multimedia-Based Vocabulary Instruction strategies. Phase 2 was the implementation of Online Multimedia-based Vocabulary Instruction. The population was four upper elementary school teachers and three classes of the sixth-grade students, totally 120 students in a primary school in Samutprakarn province. The participants were two groups of students, conveniently selected from three classes using the convenience sampling procedure. The participants were then randomly assigned to the experimental group and the control group; all participants signing a consent form and participating voluntarily.

Khlong Samrong Khlong Samrong School is a primary school under the Office of the Basic Education Commission (OBEC). The school also provides English courses for students from kindergarten to (grade six). Samut Prakan Province is one of the industrial plant areas and the school is located in a nearby industrial factories. Some of these students live with elderly grandparents while their parents work to earn a living; these elderly people cannot take a good care of their studies. Many students have the low proficiency in English, especially grade six students. The results of the Ordinary National Educational Test (ONET) for English were not quite satisfactory. There is an urgent need to develop their English ability to meet the requirements of the school and for their more advanced education level. Therefore,

the researchers selected to conduct the research by using multimedia-based vocabulary instruction with the sixth-grade students in an attempt to improve their English vocabulary knowledge.

Research Instruments

Teaching Materials for Multimedia-Based Vocabulary Instruction Training

The researchers constructed the teaching materials for training upper elementary English teachers to integrate multimedia tools for developing students' English vocabulary. The training materials included four sessions: 1) the theory and principles and how to make use of using multimedia tool in teaching English vocabulary, 2) Vocabulary teaching and learning by using educational games online for primary school students, 3) Criteria for selecting games and the examples of games appropriate for elementary school students were presented with available websites of vocabulary games, and 4) the procedure for integrating online multimedia games in English classes was demonstrated, and worksheet and exercises were provided for more practice.

English Vocabulary Pretest and Posttest

English Vocabulary Test was used as a parallel test for the pretest and posttest to assess students' English vocabulary knowledge, and it was administered to the students in both experimental and control groups before and after the implementation. Each pre-test and post-test contained totally 45 vocabulary items. The given test was aimed to determine the achievement of students' understanding of the tested vocabulary receiving the Online Multimedia-based Vocabulary Instruction and the Traditional-based Vocabulary Instruction. The test reliability value was then computing using Cronbach alpha reliability coefficient. The test exhibited a computing revealed that, overall, the test had a high degree of reliability; Cronbach's alpha was .83 which is suitable for administration of the sample groups

Teachers' Level of Satisfaction Questionnaire for Online Multimedia-based Vocabulary

The questionnaire was designed to elicit the teachers' satisfaction towards the training for using online multimedia-based vocabulary instruction after training for four weeks. There were two parts of the questionnaire: Part 1 consisted of 12 items with a five point Likert-type scale consisting of five levels (5 = Highest, 4 = High, 3 = Moderate, 2 = Low, 1 = Lowest), according to their opinions and preferences. Part 2 were six open-ended questions.

Students' Attitude towards Online Multimedia-based Vocabulary Instruction Questionnaire

The Students' Questionnaire towards Online Multimedia-based Vocabulary Instruction was designed by the researchers based on the review of literature. The questionnaire was aimed to obtain what attitude the students have towards learning English vocabulary through Online Multimedia-based Vocabulary Instruction. There were two parts of the questionnaire: Part 1 consisted of 10 items of the questions asking the students to rate a five point Likert-type scale. In Part 2, there were three open-ended questions asking the students to respond to five questions.

Data Collection and Analysis

In Phase 1, first teaching plans and training materials for English vocabulary teaching through online multimedia-based vocabulary instruction were constructed by the researchers. Then, the researchers trained the upper English elementary teachers how to teach students through online multimedia-based

instruction for 4 weeks, totally 8 hours. After the training, the teachers completed the Teachers' Satisfaction Questionnaire for Online Multimedia-based Instruction. Then a quantitative analysis of the self-ratings from the questionnaires was analyzed using descriptive statistics to determine the mean scores and standard deviations. Additionally, a qualitative analysis was conducted to triangulate the findings of the quantitative data analysis.

In Phase 2, one of the trained English teachers voluntarily taught grade sixth students to learn English vocabulary using Online Multimedia-based Instruction for 6 weeks, 12 hours in total. Before the implementation, the English vocabulary pretest was administered to the both groups and the posttest was administered at the end of the experimental week, followed by the completion of the Students' Attitude Questionnaire towards Online Multimedia-based Vocabulary Instruction. Furthermore, the experimental group's pretest and posttest mean scores on the English Vocabulary test were compared within the group using the paired t-test. Then the posttest mean scores of the experimental and control groups were compared to test if there was a significant difference in the mean scores of the posttest using the independent t-test.

Finally, the data from the questionnaire were analyzed using the descriptive statistics, the results were interpreted using five scale values: very high (4.51-5.00), high (3.51-4.50), medium (2.51-3.50), low (1.51-2.50), and extremely low (1.00-1.50). The open-ended part of the questionnaires was analyzed descriptively and grouping regarding the theme emerged in the open-ended questions.

RESULTS AND DISCUSSIONS

The Level of Satisfaction with Multimedia-based Vocabulary Instruction Training among Upper English Elementary Teachers

Table 1 The Level of Satisfaction with the Training among Upper English Elementary Teachers

Statements	M	S.D.	Interpretation (level of teachers' satisfaction)
1. Multimedia-based vocabulary learning strategy is enjoyable.	4.40	0.48	High
2. Multimedia-based vocabulary learning strategy is a useful technique for developing students 'vocabulary learning .	4.40	0.48	High
3. Multimedia-based vocabulary learning strategy helps students to learn and remember more vocabulary.	4.20	0.40	High
4. Multimedia-based vocabulary learning strategy promotes learning environments and students are happier with learning English.	4.40	0.48	High
5. Multimedia-based vocabulary learning strategy helps teachers to become more confident in developing vocabulary to students	4.00	0.63	High
6 . Multimedia-based vocabulary learning strategy promotes good relationships among students as well as between students and teachers.	4.60	0.49	Very High

7 .Multimedia-based vocabulary learning strategy helps teachers to become interested and energetic in developing student vocabulary.	4.20	0.48	High
8 .After the training of multimedia-based vocabulary learning strategy, the teachers could teach better and improve their teaching strategies.	4.40	0.48	High
9 .After the training of Multimedia-based vocabulary learning strategies, teachers were inspired to develop their own strategies.	4.20	0.40	High
10 .Multimedia-based vocabulary learning strategy gives us the positive attitude towards the English language teaching especially vocabulary teaching to students.	4.20	0.40	High
11 .Multimedia-based vocabulary learning strategy helps to develop English language teaching of primary school teachers.	4.00	0.63	High
12 .Multimedia-based vocabulary learning strategy can be used to improve students 'English vocabulary learning effectively.	4.40	0.48	High
Average	**4.28**	**0.40**	**High**

As shown in Table 1, on average the level of teachers' satisfaction with the online multimedia-based vocabulary teaching strategy training among the upper English elementary teachers was at a high level (M = 4.28, SD = 0.08). Regarding of all the questionnaire items, the level of satisfaction towards the training of online multimedia-based vocabulary instruction of the upper elementary English teachers was at the very high and high level; the mean scores ranged from 4.00 to 4.60. The highest mean score was at the very high level**.** This proved that the teachers cab be an effective teaching teachnique that they can apply in their English class to help students increase their vocabulary knowledge.

The findings mentioned above were consistent with previous studies that supported the current study in a number of ways indicating that the volunteer teachers were satisfied with the researchers' training in online multimedia-based vocabulary learning. To begin with, Phase 1 was the training of vocabulary teaching strategies for upper primary school teachers. As evidenced by the findings of previous research and the literature, teaching vocabulary strategies to primary school students are dynamic and varied. Studies in literature have also shown that interactive media significantly affects students' motivation and interest in vocabulary learning (Teng, 2022, Jing, 2020, Permana, 2018, Abbas, 2012, Newby et al, 2006). Teachers are encouraged to use interactive learning resources to help students increase their range of words. The results also supported the findings of Newby et al. (2006), stating that interactive multimedia may establish a strong connection in an engaging manner between theories and real-world teaching and learning in a fun and interesting way.

According to Abbas (2012), the use of a multimedia tool under instructor management improved teacher and student communication in the classroom. In multimedia environment, students would be more independent and engage learners, so the students can effectively participate in language learning with the use of visually appealing graphics, animation, or sound effects. Additionally, the findings in the current study were supported by Abdul Rabu and Talib's study (2017) which demonstrated that play-based learning specifically, playing games online or through digital platforms-improved young learners' speak-

ing, listening, writing, and reading skills. Teng (2022) added that multiple types of input, rather than a single type, therefore promoted vocabulary learning. A useful point from the cognitive theory of multimedia learning is that the simultaneous verbal and visual information presentation can capture learners' attention and help them construct mental images depicting connection or providing a picture (Mayer, 2001).

The findings from the qualitative part of the open-ended teachers' questionnaire can support the quantitative data.

Overall, the teachers described that

> They thought that they would apply different activities provided online such as action games, digital games,educational games, matching games word games, cartoons and storytelling by selecting the games appropriate for the level of students (grade six) and relevant to word list required in the curriculum. It is a new teaching strategy that can engage students who have low motivation and are slow learners. Moreover, the online multimedia-based vocabulary instruction was more student-centered; they performed the role of a facilitator who prepared the activities for their students.

Another response by one teacher

> These online games can be used for teaching vocabulary, so the students paid more attention to the class and focused on their phone. This technique inspired students to retain more vocabulary and acquire new vocabulary, spelling, and pronunciation."

One of the teachers wrote that

> I could follow the procedures for teaching vocabulary during the training, so they believed that drills, practice, and the animation, colors, music, and sound effects in the online games or tasks could help students acquire their vocabulary learning leading to long-term learning and sustain it overtime.

One of the teachers expressed that

> I learned that using this strategy is an activity-based teaching. There are various types of activities that can be applied to teaching vocabulary. Most students like to walk around, participate in class activities, and work in pairs or groups. I believed that this strategy is helpful since many online games and activities are enjoyable and students love playing when they can talk more.

However, the teachers noted some problems in their responses.

> I need well-equipped classrooms with Wi-Fi, LEDs, and projectors can help the students learn more effectively. Some students do not own a smart phone with a good quality; they share with their friend. Moreover, some students cannot access to the Internet at home, so they cannot self-study as expected.

To sum up, the English teachers at the upper elementary school reported having a positive experience with the training on using Onnline Multimedia-based Vocabulary Instruction to help pupils improve their vocabulary knowledge. Teachers' satisfaction with the training was demonstrated by the fact that online multimedia-based vocabulary instruction is one of the most effective techniques to enhance the sixth-grade students' vocabulary learning. When vocabulary learning is integrated with play-based learning, game-based learning, digital game-based learning, and app-based learning, students can develop positive connections with learning and language acquisition. Additionally, it allows students to try new things with language in a friendly environment.

The Effectiveness of English Vocabulary Teaching Strategies through Online Multimedia-based Voabulary Instruction

Table 2 Means and Standard Deviations on the English Vocabulary Pretest and Posttest for the Students in the Experimental and Control Groups

Participant Groups	N	English Vocabulary Pre-test		English Vocabulary Posttest	
		M	*SD*	*M*	*SD*
The Experimental Group (Multi-Media-Based Vocabulary Instruction)	33	21.21	10.12	31.64	7.01
The Control Group (Traditional-based Vocabulary Instruction)	27	24.37	9.02	28.89	9.59

As presented in Table 2, the overall mean scores on the English vocabulary pretest and for the experimental group (Multimedia-Based Vocabulary Instruction) and the control groups (Traditional-based Vocabulary Instruction) were 21.21 and 24.37 with the standard deviations of 10.12 and 9.02 respectively. Moreover, the overall mean scores on the English vocabulary posttest for the experimental group and the control group were 31.64 and 28.89 with the standard deviations of 7.01 and 9.59 respectively. However, during the implementation, the students in the control group were missing because of the family problem, so they did not come back to school while there were three more students in the experimental group.

Comparison between the Mean Scores on the English Vocabulary Pretest and Post-Test of the Experimental Group Learning through Online Multimedia-Based Vocabulary Instruction

Table 3 presents the comparison between the means and standard deviations on the English vocabulary test on pretest and posttest of the students in the experimental group.

Table 3 The Comparison between the Mean Scores on the English Vocabulary Pretest and Post-test of the Experimental Group Learning through Multi-media -Based Vocabulary Instruction

the English Vocabulary Test	N	Multimedia- Based Vocabulary Instruction		Mean Difference	*t-test*	*df*	*p-value*
		M	*SD*				
Pretest	33	21.21	10.12	10.42	-11.12	32	.00**
Posttest	33	31.64	7.01				

**Significant at the 0.00 level (P≤ 0.05

As shown in Table 3, the results revealed that there was a statistically significant difference in the mean score of the English vocabulary before studying (pretest) and after studying (posttest) of the experimental group (Multimedia-based instruction) using Pair-Samples T-test at the 0.00 level (P-value≤ 0.05). That is, the mean score of the posttest (*M*=31.64 .*SD*. = 7.01) was statistically higher than that of the pretest (*M*= 21.11, *SD*. = 10.12).

The Comparison between the Mean Scores on the English Vocabulary Pretest and Post-Test of the Experimental Group Learning through Multimedia-based Vocabulary Instruction

Table 4 presents the comparison between the means and standard deviations on the English vocabulary test on pretest and posttest of the students in the control group.

Table 4 The Comparison between the Mean Scores on the English Vocabulary Pretest and Post-test of the Control Group Learning through Traditional Based Vocabulary Instruction

The English Vocabulary Test	N	Control Group Traditional-Based Vocabulary Instruction		Mean Difference	t-test	df	p-value
		M	*S.D.*				
Pretest	27	24.37	9.02	4.52	- 3.87	26	.001**
Posttest	27	28.89	9.59				

**Significant at the 0.00 level *(P-value≤0.05*

As presented in Table 4, the result of the paired t-test between the mean scores of the pretest and the posttest of the students in the control group learning English vocabulary through Traditional-Based Vocabulary Instruction revealed that it was found that the mean scores of the posttest increased by 4.52 percent, and a statistically significant difference was found at the 0.01 level (t= -3.87, p≤ 0.05).

The Comparison between the Mean Scores on the English Vocabulary Post-test of the Experimetal Group and the Control Group

The researchers compared the mean scores of the English vocabulary posttest of the experimental group and control group to determine whether Multimedia-Based Vocabulary Instruction is more effective in developing the participants in the experimental group than the control group learning through Traditional-Based Vocabulary Instruction using the independent t-test. The results were illustrated in Table 5.

Table 5 The Comparison between the Mean Scores on the English Vocabulary Post-test of the Experimental Group and Control Group

Group of Students	N	English Vocabulary Posttest		Mean Differences	t-test	df	p-value
		M	*SD*				
The Experiment Group	32	31.69	7.12	2.80	1.28	57	0.20
The Control Group	27	28.89	9.59				

As shown in Table 5, test results of Independent-Samples Test of the pretest scores of students in the experimental group (Multimedia-Based Vocabulary Learning Instruction) and the control group (the Traditional-Based Vocabulary Instruction) found that the posttest scores of students in grades both groups value is equal to 0.20, which has a *p*-value greater than 0.05, meaning that there was no

significant difference in the average posttest scores of students in the experimental group and the control group.

In the experiment study (Phase 2), the research aimed to examine whether the Online Multimedia-based Vocabulary Instruction is effective in improving vocabulary learning of the sixth grade students in Klong Samrong School. The comparison between the mean scores on the English vocabulary posttest of the experimental group learning vocabulary through Online Multimedia-Based Vocabulary Instruction and the control group learning through Traditional-Based Vocabulary Learning showed that there was no significant difference in the average posttest scores of students in the experimental group and the control group. The reason for this might be the time for implementation only lasted for six weeks. It was enough for practice and did the class activities. Some students did not have any smart phone, or computer to practice by themselves or self-study at home. However, when looking at the statistical results from the pretest score and posttest score within the experimental group, it was revealed that there was a statistically significant difference in the mean score of the English vocabulary before studying (pretest) and after studying (posttest) of the experimental group. That is, the mean score of the posttest (M=31.64 .SD. = 7.01) was statistically higher than that of the pretest (M= 21.11, SD. = 10.12).

When comparing the mean scores of both groups, the mean score of the experimental group was higher than that of the control group. This showed that the students in the experimental group performed better than the control group. That is, the Online Multimedia-Based Vocabulary Instruction might be more effective in developing students' vocabulary learning than that of the Traditional-based Vocabulary Instruction.

The plausible explanations can be as in the following. First, many studies have shown that a large number of students, especially EFL learners are tired of traditional English classes, but interested in new techniques of learning. Since they are in the digital era, they have positive attitude towards computer technology used in the classroom, and such technology does have a positive impact because multimedia teaching has many advantages over other media in English teaching (Zhen, 2016). In this study, the Online Multimedia-Based Vocabulary Instruction was constructed by the researchers in order to make vocabulary learning easy and interesting for primary school students. The trained teachers agreed that this model of instruction can be applied to their classroom successfully. After the experiment, grade six students' scores on the English vocabulary test increased. This means that they enjoyed learning and remembered the new words. Primary schools students may acquire vocabulary through the well-designed educational applications (apps) and internet resources. These online resources usually incorporate interactive games, exams, and multimedia elements to keep children interested while teaching them new vocabulary (Permana, 2020).

Additionally, the results of the current study were in consistency with Utku and Dolgunsöz (2018) who investiagted the effect of online games on grade five students' vocabulary mastery. They believed that the students are digital native and familiar with online gaming. The findings revealed that students' vocabulary knowledge was greatly affectted by the online gaming environment. Additionally, they discovered that students are motivated to study when learning with online games. The results of a study conducted on language learning of young learners through computer games in Turkey by Turgut and Irgin (2009) revealed that the performance of young learners involved in playing online games was better in language skills, especially vocabulary skill. Zhen (2016) supported this notion by stating that employing multimedia can motivate students to write and talk. Futhermore, Zhen proposed that using multimedia in teaching-learning process can be beneficial as follows. a) To increase the learners

motivation. b) To avoid the learners' feeling bored. c) To make the learners easy to understand the instructional material, and d) To make the teaching learning process more systematic. He (2021) agreed and stressed that the fundamental issues include how and why multimedia may help Chinese primary school students learn English due to their perception that English classes are uninteresting. Like other EFL students in elementary schools, Thai students are losing interest in learning the language. As a result, it is crucial that English teachers in Thai classes come up with a strategy that would encourage students to continue learning the language and sustain their enthusiasm for studying the language. The results of the study by Rakangthong and Yimwilai,(2020) with the Thai EFL students in the 11th grade showed that the students' vocabulary had increased. The mean scores of the pre- and post-tests for both groups showed statistically significant changes, indicating that the digital gaming resources were successful in improving the vocabulary knowledge of EFL students. Additionally, students were at a highly positive level of attitude towards vocabulary learning through the digital game resources. Bakhsh (2016) added that games are an effective tool in teaching vocabulary when they are designed to help the students memorize and understand meaning. It was also able to boost students' motivation and confidence in learning vocabulary. This study demonstrated that improving students' vocabulary knowledge might be achieved via the use of digital gaming materials. Digital gaming resources also simplified and improved the vocabulary-learning process**.**

The Students' Attitude Towards the Online Multimedia-based Vocabulary Instruction for Improving English Vocabulary Learning: The Findings from the Quantitative Results

Table 6 Students' Attitude in the Experimental Group towards the Online Multimedia-Based Vocabulary Instruction for Improving the English Vocabulary Learning

Statements	M	SD.	Interpretation Value of Students' Attitude
1. Activities for multimedia-based vocabulary instruction are entertaining and engaging.	4.88	0.33	Very High
2. Activities for multimedia-based vocabulary instruction to develop English vocabulary learning are diverse.	4.73	0.45	Very High
3. Activities for multimedia-based vocabulary instruction contain language appropriate for the student proficiency level.	4.55	0.62	Very High
4. Activities for multimedia-based vocabulary instruction have a clear, non-repetitive sequence of steps	4.52	0.67	Very High
5. Activities for multimedia-based vocabulary training give information adapted to the requirements of the students.	4.48	0.67	High
6. Activities for multimedia-based vocabulary instruction with illustrations helps students understand	4.67	0.65	Very High

the meaning and retain the vocabulary even more.			
7. Activities for multimedia-based vocabulary instruction using gestures help students to express themselves and challenge their ability.	4.58	0.61	Very High
8. You clearly understand the purpose of the multimedia-based vocabulary instruction that teachers utilize to help	4.55	0.75	Very High
9. Activities for multimedia-based vocabulary instruction encourage you to practice pronouncing words and speaking English more.	4.42	0.75	High
10. Activities for multimedia-based vocabulary instruction are appropriate for using in English language learning environments.	4.61	0.75	Very High
Total	**4.60**	**0.65**	Very High

As presented in Table 6, the results revealed that the average mean of all the items of the questionnaire was very high. That is, the students' attitude towards learning vocabulary through Multimedia-based Vocabulary Instruction was very high (M=4.60, SD. = 0.75). The highest level fell into Item 1 (M=4.88, SD. = 0.33); the students reflected that activities through the online Multimedia-based Vocabulary Instruction are interesting and engaging. The lowest mean score fell into Item 9 (M=4.42, SD. = 0.75). They realized that activities for multimedia-based vocabulary instruction encourage them to practice pronouncing words and speaking English more.

The findings showed that students had a highly positive attitude on learning vocabulary through Multimedia-based Vocabulary Instruction. The highest level was found in Item 1 (*The students reflected that activities through the online Multimedia-based Vocabulary Instruction are interesting and engaging*). The lowest mean score was Item 9 (*They realized that activities for multimedia-based vocabulary instruction encourage them to practice pronouncing words and speaking English more*) had the lowest mean score. However, they continued to have a very high attitude. In short, all of the questionnaire's items had very high average means. This demonstrated the students' positive attitude toward learning English vocabulary through Online Multimedia-Based Vocabulary Instruction. To support the quantitative results from the questionnaire, Table 7 presents the qualitative results from the open-ended part of the questionnaire.

Qualitative Results from the Open-ended Questionnaire
Table 7 Students' Attitudes towards Learning by Online-Multimedia-Based Vocabulary Instruction

Open-ended Questions	Students' Opinions	Frequency	Percentage (%)
1. Do you like learning English by using online multimedia-based vocabulary instruc-	By learning English vocabulary through Online Multimedia-Based Vocabulary Instruction, they learned new vocabulary about food and drinks and various fruits, could share ideas with friends when doing class activities like in the Mind Mapping and developed	11	33.33

tion to develop their learning of English vocabulary? Why?"	their vocabulary knowledge. They had improved their experience by learning how to ask and respond to questions regarding the price of the items.		
	Learning vocabulary through Online Multimedia-Based Vocabulary Instruction in a fun and interesting way, and they were able to remember the meaning of the words.	9	27.27
	Enjoying Online Multimedia-Based Vocabulary due to the fact that they could talk more while utilizing the new language they had learnt from the game practice.	4	12.12
	The students preferred to learn with this strategy because they could pronounce read, and write the new words (e.g. type of food, drink and fruit).	9	27.27
	Total	**33**	**100**
2. Do students benefit from learning by using Online Multimedia-Based Vocabulary Instruction to develop English vocabulary learning? Explain?	They could ask for and provide information about themselves through speaking and writing. They cannot talk or express themselves about friends, family, themselves, or other local issues if they do not have the vocabulary. They could produce questions and responses different kinds of food and beverages.	6	18.18
	Online Multimedia-Based Vocabulary Instruction is a tool that facilitates the creation of additional phrases while speaking English and creating sentences.	7	21.21
	They enjoyed the classroom environment and had the chance to paint and decorate wonderfully to express how they understood the new word.	7	21.21
	Many students who responded to the application said they like the slam game because it was very competitive and taught them new vocabulary, and the "scrabble slam" game rules is simple to follow.	13	39.39
	Total	**33**	**100**

Open-ended Questions	Students' Opinions	Frequency	Percentage (%)
3. From studying using Online Multimedia-Based Vocabulary Instruction (OMBVI) to develop English vocabulary learning what were you	The respondents were most impressed with playing online games as a group because those who are more skilled can help each other think of answers.	9	27.27
	Using the online dictionaries was the most preferable strategy for them.	6	18.18
	The students preferred watching the animations, so they learned and remembered the meaning of new words and use them to write the new sentences.	4	12.12

most impressed by? Why?	They agreed that learning Online Multimedia-Based Vocabulary Instruction is an excellent and efficient strategy because it helped them significantly improve their performance on vocabulary tests. They thought that their vocabulary retention improved positively.	7	21.21
	Total	**33**	**100**

Accoording to Table 6, and Table 7, the findings of the current research were consistent with previous studies in in EFL seting. For example, Novitasari and Prijambodo (2022) investigated the   students' attitudes towards Quizlet in English vocabulary learning. The participants were students from the English vocabulary class. The Quizlet (https://quizlet.com) is an online vocabulary learning tool, Quizlet allows the students to learn vocabulary by means of flashcard sets using a variety of game-like learning tools. The results showed that students' positive attitudes towards Quizlet encouraged their learning of English vocabulary, and its features facilitated their vocabulary learning In line with an   experimental study, Sereepornpong (2021) examined the use of a smartphone application for Thai   students and their attitudes and perceptions toward vocabulary learning with a smartphone application. The study involved 62 ninth-grade students from a Thai government school, divided into two groups: the experimental group, who learned vocabulary through the applications, and the control group, who used traditional-based teaching method. The results showed that the mobile application improved vocabulary acquisition and students were satisfied with the mobile application; they had high positive attitudes toward the mobile application. In the other study, Wijaya & Devianto (2019) employed the ADDIE model in making multimedia applications for basic English vocabulary learning more interesting and interactive in addition to English language learning materials for elementary school students in   Indonesia. The   results revealed that nearly 80% of the respondents strongly believe that multimedia apps. is able to attract students' attention and anticipate the learning process, encourage active students to understand learning and the images and animations that are presented can increase students' enthusiasm in understanding English vocabulary at the elementary level. One of the previous studies, Klentien and Kamnungwut (2015) sought to study the impact of using electronic media software program in teaching English for students in elementary and secondary schools under the Office of Basic Education Commission (OBEC) in Thailand. The findings showed that the students were greatly satisfied with the program in all aspects, ranging from learning activities in the lessons and website, contents, and teaching techniques. This proved that electronic media can also respond to student desires and increase learning satisfaction.

RECOMMENDATIONS

The researchers have made the following suggestions:

In order to successfully implement multimedia-based vocabulary learning play-based learning appsbased learning, or digital game-based learning in classrooms, it is first necessary for all teachers to complete a training program, and professional tdevelopment in terms of the integration of multimedia in English classes in conjunction with the use of technology tools for education and changes in students' learning habits to meet the demands of 21st-century society.

It is also crucial that the limitations of this study serve as a basis for future research in this area. This study recommends adding more students in larger schools with well-equipped technology support with varying educational levels and skills.

Moreover, there are a few more things that need to be considered for future research. The current study investigated the effect of online multimedia-based on vocabulary learning, other research studies on the effect on different English skills are required.

Additionally, the future research on multimedia should explore more about successful design concepts for producing multimedia-rich language learning resources. Studies with a longitudinal design are required to assess the long-term effects of using a variety of multimedia sources and varying student ability levels that support educational objectives in multimedia design.

Lastly, it is advised to extend the implementation to provide students additional opportunity to engage with the language and vocabulary. The data may provide different results if there is time throughout the academic year to execute a long-term traditional study followed by a second long-term session of online multimedia-based learning with new terms and the same participants.

CONCLUSION

In conclusion, the study aimed to determine the effectiveness of Online Multimedia-based Vocabulary Instruction in improving vocabulary learning in primary school students. Upper English primary school teachers were trained to use online multimedia materials as a vocabulary teaching strategy. Sixth-grade students were taught English vocabulary through this method. Despite limited exposure to online multimedia resources, students successfully learned and expanded their vocabulary, indicating the technique's potential for improving vocabulary learning of primary school students. Online multimedia resources can help students acquire vocabulary in a real-world setting, inspiring them to learn English. This study uses social-constructivist theory, comprehensible input, and cognitive theory to teach vocabulary. The integration of multimedia technology is essential in 21st-century education, developing higher-order thinking processes, autonomous learning, and self-regulation. It bridges the gap between digital learning preferences and conventional language teaching techniques, promoting active and constructive learning.

ACKNOWLEDGEMENTS

CONFLICTS OF INTEREST STATEMENT

The author declares no conflicts of interest.

ABOUT AUTHORS

Rapeepat So-In is currently an English instructor scholar in Business English program, Faculty of Liberal Arts, Southeast Bangkok University (SBU), Bangkok, Thailand. His interests concern communicative language teaching (CLT), the integration of multimedia and the innovative teaching.

Walaiporn Chaya is currently an English instructor and research scholar in Business English program, Faculty of Liberal Arts, Southeast Bangkok University (SBU), Bangkok, Thailand. Her research interests include English language teaching, (ELT), metacognitive strategies, research on EFL' reading and writing, interactive learning, and active learning.

REFERENCES

1. Abbas, P. G. (2012). The significant role of multimedia in motivating EFL learners' interest in English language learning. International Journal of Modern Education and Computer Science, 4(4), 57-66.

2. Abdul Rabu, S. N., & Talib, Z. (2017). The effects of digital game-based learning on primary school students' English vocabulary achievement and acceptance. Innovative Teaching and Learning Journal, 1(1), 61-73.

3. Ahmadi, D. M. R. (2018). The use of technology in English language learning: a literature review. International Journal of Research in English Education, 3(2), 115-125. https://doi.org/10.29252/ijree.3.2.115

4. Alqahtani , M. (2015).The importance of vocabulary in language learning and how to be taught. International   Journal of Teaching and Education, *3*(3), 21-34. DOI: 10.20472/TE.2015.3.3.002

5. Bakhsh, S. A. (2016). Using Games as a Tool in Teaching Vocabulary to Young Learners. English Language Teaching, 9(7), 120.

6. Binmudnee, P., Abdulsata, S. ., Hama, I. ., Maduereh, R. ., & Takaeh, S. . (2021). The development of the English vocabulary application on Android operating system for upper – primary students in five southern border provinces. Interdisciplinary Research Review, 16(3), 8–13.

7. Brown, H. D. (2000). Principles of language learning and teaching (4). New York: Longman.

8. Dawson, M. (2023). The use of multimedia in foreign language teaching from the perspective of cognitive psychology. SSRN Blog. http://dx.doi.org/10.2139/ssrn.4675933, 1-6.

9. Duffy, T. M., & Cunningham, D. J. (1996). Constructivism: Implications for the design and delivery of instruction. In D. H. Jonassen (Ed.), Handbook of Research for Educational Communications and Technology. NY: Macmillan Library Reference USA.

10. Ganapathy, M., & Seetharam, S. A. (2016). The effects of using Multimodal Approaches in meaning-making of 21st century literacy texts among ESL students in a private school in Malaysia. Advances in Language and Literary Studies,7,143-155. https://doi.org/10.7575/aiac.alls.v.7n.2p.143

11. Gonen, K. (2018). ESL Teachers' perceptions of using technology . Conference presentation-Prezi]. English Language Symposium 2018: New perspectives in English language teaching. King Abdulaziz University. 13-14.

12. Gilakjani, A.P. (2012). The Significance of role of multimedia in motivating EFL learners' interest in English language learning. I.J.Modern Education and Computer Science, 4, 57-66. DOI:10.5815/ijmecs.2012.04.08

13. Haddad, R. H. (2016). Developing learner autonomy in vocabulary learning in classroom: how and why can it be fostered? Procedia - Social and Behavioral Sciences, 232, 784-791.

14. Han, M. & Wei , N. (2016). An analysis on English vocabulary teaching in primary schools. International Journal of Arts and Commerce, 5(5), 95-100.

15 . Harmer, J. (2007). The Practice of English language teaching (4th Ed.). Essex: Pearson, Longman

16. Harmer, J. (2008). The practice of English language teaching. England: Pearson Longman. http://dx.doi.org/10.1093/elt/ccp007.

17. Hazar, E. (2020). Use of digital games in teaching vocabulary to young learners. Educatia 21 Journal, 1 (19), 99-104. . https://doi.org/10.24193/ed21.2020.19.12.

18. He, W. (2021). The effects of applying multimedia in primary English language teaching in China Parahikma Journal of Education and Integrated Sciences, 1(1), 9-15.

19. Jing, J. (2018). Strategies in primary school vocabulary teaching. English Literature and Language Review, 4 (1), 13-15.

20. Katemba, C.V. (2022). Vocabulary enhancement through multimedia learning among grade 7th EFL students. MEXTESOL Journal, 46, (1), 1-13.

21. Kiymazarsian, V. (2020). Teaching vocabulary through compelling and comprehensible input. Chapter in the book (pp.1-26). Current Perspective on Learning and Teaching Vocabulary. Cambridge Scholars Publishing. London. UK.

22. Klentien, U. & Kamnungwut, W. (2014). The impact of using electronic media in English teaching for elementary and secondary students in Thailand. International Journal of Information and Education Technology, 5, (8), 582-586.

23. Kongprab, T. (2019). Effects of digital-game-based learning on Vocabulary gain, retention, motiva tion and perceptions of Thai upper primary school students. [Unpublished Master Thesis]. Prince of Songkhla Unversity. https://kb.psu.ac.th/psukb/bitstream/2016/13459/1/438206.pdf

24. Krashen, S.D. (1989). We acquire vocabulary and spelling by reading: additional evidence for the input hypothesis. The Modern Language Journal, 73(4), 440-462.

25. Krashen, S. D., & Terrell, T. D. (2000). The natural approach: Language acquisition in the classroom New York: Longman.

26. Laufer. B. (1997).The Lexical plight in second Language reading: Words you know, words you don't know, and words you can't guess. In Coady's & Hucken's Second language vocabulary acquisition., 35-54. Cambridge University Press.

27. Lessard-Clouston, M. (2013). Teaching vocabulary. Alexandria, VA: TESOL International Association.

28. Manyak, P. C., & Bauer, E. B. (2009). English vocabulary instruction for English learners. The Reading Teacher, 63(2),174-176.

29. Marpaung, M.S. & Situmeang, H.J.P. (2020). Enhancing students' Vocabulary through authentic materials and multimedia Journal of English Language Pedagogy, Literature and Culture, 5(2), 85-101. https://doi.org/10.35974/acuity.v5i2.2247

30. Mayer, R. E. (1997). Multimedia learning: Are we asking the right questions? Educational Psychologist, 32(1), 1-19.

31. Mayer, R. (2001). Multimedia learning. New York. Cambridge University Press. http://dx.doi.org/10.1017/CBO9781139164603.

32. Mayer, R.E. & Chandler, P. (2001). When learning is just a click away: Does simple interaction foster deeper understanding of multimedia messages? Journal of Educational Psychology,93, 390-397.

33. Mayer, R.E., Sobko, K. & Mautone, P. D. (2003) Social cues in multimedia learning: role of speaker voice. Journal of Educational Psychology, 95, 419-425.

34. Mayer, R. E. (2005). Cognitive Theory of Multimedia Learning. In R. E. Mayer (Ed.), The Cambridge handbook of multimedia learning (pp. 31–48).Cambridge University Press. https://doi.org/10.1017/CBO9780511816819.004

35. Mayer, R. E. (2009). Multimedia learning (2nd Ed.). Cambridge, England: Cambridge University Press.

36. McCarthy, M. (1990). Vocabulary. Oxford: Oxford University Press.

37. Mthethwa, P. (2018). Teaching vocabulary using multimedia: the case of U.S. international students. Global Journal of Foreign Language Teaching. 8(2), 68-75.

38. Mukoroli, J. (2011). Effective vocabulary teaching strategies for the English for academic purposes ESL classroom. AYMAT Individual Thesis/ SMAT IPP Collection. Paper 501. http://digitalcollections.sit.edu/ipp_collection/501

39. Nation, P. (2013). Learning vocabulary in another language. Cambridge: Cambridge University Press.

40. Nation, P. (2011). Learning vocabulary in lexical sets: dangers and guidelines. TESOL Journal, 9 (2), 6-10.

41. Newby, T. J., Stephic, D. A., Lehma, J. D., & Russell, J. D. (2006). Educational Technology Teaching and Learning (3 ed.). Ohio: Pearson Prentice Hall.

42. Novitasari, E, & Prijambodo, L. (2022). Students' attitudes towards Quizlet in English vocabulary learning. Magister Scientiae, 50 (2). https://doi.org/10.33508/mgs.v50i2.4156

43. Nunan, D. (1999). Second language teaching and learning. Boston: Heinle & Heinle Publishers.

44. Permana, I.G.Y. (2020). Teaching vocabulary for elementary school students (A literature review). The Art of Teaching English as a Foreign Language, 1 (2), 1-4 DOI: 10.36663/tatefl.v1i2.56

45. Pandey, M. (2014). The use of the multimedia in the teaching and learning of English Laguage. https://www.academia.edu/5649523/ Use_of_Multimedia_in_EnglishLanguage Teaching.

46. Pun, M. (2013). The use of multimedia technology in English language teaching: A global perspective. Crossing the Border. International Journal of Interdisciplinary Studies,1, 29-38.

47. Rakangthong, S. & Yimwilai, S. (2020). The effects of using digital game resources to enhance EFL students' English vocabulary knowledge at Phimanphitthayasan School, Satun, Thailand. Proceedings of RSU International Research Conference 2020, 1114-1124. https://rsucon.rsu.ac.th/proceedings.

48. Reinders, H., & Wattana, S. (2012). Digital games in language learning and teaching: Talk to me! Games and students' willingness to communicate. Chapter in the book. London: Palgrave, Macmillan. doi:10.1057/9781137005267_9.

49. Rohim, S. & Yulind, L. (2014). Multimedia development of English vocabulary learning in primary school. Proceedings of the 22nd International Conference on Computers in Education. Japan: Asia-Pacific Society for Computers in Education, 750-755.

50. Saengpakdeejit, R. (2014). Awareness of vocabulary learning strategies among EFL students in Khon Kaen University. Theory and Practice in Language Studies, 4(6), 1101-1108.

51, Salimi A, Zangeneh H. (2022). The effect of gamification on vocabulary learning (learning English as a second language) among the fifth-grade elementary school students. Technology Education Journal, *16*(4), 723-734. doi.org/10.22061/tej.2022.8550.2686.

52. Schmitt, N. (2000). Vocabulary in Language Teaching. Cambridge. U.K: Cambridge University Press.

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

54. Sereepornpong, U. (2021). A Study of English Vocabulary Learning Using a Mobile Application. [Unpublished Master Thesis]. Thammasat University Institute, Bangkok, Thailand

55. Shao, J. (2012). A Study of multimedia application-based vocabulary acquisition. English Language Teaching, 5, (10), 202-207.

56. Tabeweka, S. N. (2021). The Impact of digital games on English vocabulary learning in middle school in Sweden (ages 9-12). (Dissertation).

57. Taj, H.I., Ali, F., Sipra, M.A. & Ahmad, W. (2017). Effect of technology enhanced language learning on vocabulary acquisition of EFL learners. International Journal of Applied Linguistics & English Literature, 6(3), 261-272.

58. Teng, M.F. (2022). The effectiveness of multimedia input on vocabulary learning and retention, Innovation in Language Learning and Teaching, DOI:10.1080/17501229.2022.213179

59. Thamarana, S. (2016) Use of Multimedia technologies in English language learning: A study. International Journal of English Language Teaching, 4(8), 15-30.

60. Thannchalearnpanith, P. (2012). Using games on students' vocabulary learning. Srinakharinwirot University (SWU), Thailand, 816- 825.

61. Turgut, Y., & Irgin, P. (2009). Young learners' language learning via computer games. Procedia-Social and Behavioral Sciences, 1, 760-764.65.

62. Utku, Ö., & Dolgunsöz, E. (2018). Teaching EFLvocabulary to young digital natives through online games: A study with Turkish 5th grade EFL learners. International Online Journal of Education and Teaching, 5(1), 115–130.

63. Wahid, A. , Luhriyani, S. & Jefri, R. (2021). Multimedia-based English vocabulary lesson in the elementary school: A Classroom Action Research (CAR). Advances in Social Science, Education and Humanities Research, 654, 295-299. Proceedings of the 1st World Conference on Social and Humanities Research (W-SHARE 2021).

64. Wijaya, D. & Devianto, Y. (2019). Application of multimedia in basic English vocabulary learning. International Journal of Computer Techniques, 6 (1), 57- 63.

65. Yang, P. J. (1998). Networked multimedia and foreign language education. CALICO Journal, 15(1-3), 75-88. DOI: 10.1558/cj.v15i1-3.75-88

66. Zahedia, Y. & Abdi, M. (2012). The impact of imagery strategy on EFL learners' vocabulary learning. Procedia - Social and Behavioral Sciences 69, 2264 – 2272 International Conference on Education and Educational Psychology (ICEEPSY 2012

67. Zhen, Z. (2016). The use of multimedia in English teaching. Journal of US-China Foreign Language, 14(3), 182-189. Doi:10.17265/1539-8080/2016.03.002

68. Zimmerman, C.B. (2007). Vocabulary learning methods. Cambridge Massachusetts: Harvard University Press.