# THE EFFECTS OF MULTIMEDIA AND MODALITY PRINCIPLES ON VOCABULARY LEARNING AMONG FORM FOUR STUDENTS

**by**

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| L2 | Second Language |
| ESL | English as a Second Language |
| T | Text Gloss |
| TP | Text and Picture Gloss |
| AP | Audio and Picture Gloss |
| H | High Proficiency |
| M | Medium Proficiency |
| L | Low Proficiency |
| MRSM | Maktab Rendah Sains MARA |

**KESAN PRINSIP MULTIMEDIA DAN MODALITI DALAM KALANGAN PELAJAR TINGKATAN EMPAT TERHADAP PEMBELAJARAN PERBENDAHARAAN KATA**

## ABSTRAK

Kajian ini bertujuan untuk meneliti kesan Prinsip Multimedia dan Modaliti berdasarkan tahap penguasaan pelajar Tingkatan Empat terhadap pembelajaran perbendaharaan kata. Pengenal pastian kesan Prinsip Multimedia dan Modaliti dalam pembelajaran perbendaharaan kata serta-merta dan pengekalan perbendaharaan kata ini dilakukan menerusi penggunaan anotasi multimedia. Kajian ini juga bertujuan untuk mengenal pasti kesan interaksi antara kaedah rawatan dan tahap kemahiran pelajar. Seramai 306 pelajar yang berumur 16 tahun dari tiga buah Maktab Rendah Sains MARA (MRSM) di zon utara, Semenanjung Malaysia telah terlibat dalam kajian ini. Pelajar-pelajar dari setiap MRSM ini menerima rawatan yang berbeza; anotasi teks, anotasi teks dan gambar dan anotasi audio dan gambar. Sebanyak tiga puluh perkataan sasaran yang dianotasikan dalam bentuk teks, teks dan gambar serta audio dan gambar yang dipadankan bersama teks bacaan. "Immediate Vocabulary Test" dan "Delayed Vocabulary Test" terdiri daripada dua bahagian iaitu "Word Recognition Test" dan "Sentence Completion Test'. "Immediate Vocabulary Test" telah diuji kepada pelajar sejurus menjalani rawatan dan "Delayed Vocabulary Test" diuji dua minggu kemudian. Ujian-ujian ini digunakan untuk menilai pembelajaran perbendaharaan kata serta-merta dan pengekalan perbendaharaan kata dalam kalangan pelajar. Dapatan kajian menunjukkan bahawa penggunaan Prinsip Multimedia dan Modaliti melalui anotasi multimedia dapat meningkatkan pembelajaran perbendaharaan kata serta-merta dan

pengekalan perbendaharaan kata. Hal ini dapat dilihat daripada dapatan kajian bagi kumpulan anotasi teks dan gambar yang mencatat pencapaian yang lebih baik berbanding kumpulan anotasi teks dalam "Immediate Vocabulary Test" dan . "Delayed Vocabulary Test". Selanjutnya, perbandingan antara penggunaan anotasi teks dan gambar dengan penggunaan anotasi audio dan gambar untuk mengkaji kesan Prinsip Modaliti menunjukkan bahawa dapatan kajian bagi penggunaan anotasi audio dan gambar adalah lebih tinggi berbanding dengan penggunaan anotasi teks dan gambar. hal ini demikian kerana kumpulan anotasi audio dan gambar menunjukkan penguasaan lebih baik daripada kumpulan anotasi teks dan gambar dalam "Immediate Vocabulary Test dan "Delayed Vocabulary Test". Hal ini membuktikan bahawa Prinsip Modaliti membantu dalam meningkatkan pembelajaran perbendaharaan kata serta-merta dan pengekalan perbendaharaan kata berbanding Prinsip Multimedia. Selain itu, dapatan kajian dilihat menunjukkan terdapatnya kesan interaksi yang signifikan antara kaedah rawatan (T dan TP) dengan tahap penguasaan pelajar (Tinggi (H), Sederhana (M) dan Rendah (L) dalam pembelajaran perbendaharaan kata serta-merta dan pengekalan perbendaharaan kata. Walau bagaimanapun, kesan interaksi antara kaedah rawatan (TP dan AP) dengan tahap kemahiran (Tinggi (H), Sederhana (M) dan Rendah (L) adalah tidak signifikan dalam pembelajaran perbendaharaan kata serta-merta dan pengekalan perbendaharaan kata. Pengaplikasian prinsip modality dalam pembangunan bahan pengajaran dan pembelaran perbendaharaan kata Bahasa Inggeris dapat menghasilkan kaedah yang dinamik serta memberi motivasi untuk pembelajaran pembendaharaan.

**THE EFFECTS OF MULTIMEDIA AND MODALITY PRINCIPLES ON VOCABULARY LEARNING AMONG FORM FOUR STUDENTS**

## ABSTRACT

This study investigated the effects of Multimedia and Modality Principles via multimedia glosses on immediate vocabulary learning and vocabulary retention among Form Four students with different proficiency levels. This study also sought to examine the interaction effects between the treatment modes and students' proficiency levels. The participants were 306, 16 year-old students from three Maktab Rendah Sains MARA (MRSM) in the northern zone, Malaysia. Students in each MRSM received a different treatment; Text gloss (T), Text and Picture gloss (TP) and Audio and Picture gloss (AP). Thirty target words, glossed in text, text and picture or audio and picture, were embedded in the reading text. Immediate and Delayed Vocabulary Tests consisted of Word Recognition and Sentence Completion Tests were administered immediately after the treatment and two weeks later. These tests were used to assess immediate vocabulary learning and vocabulary retention among students. Results revealed that the application of Multimedia and Modality Principles in developing multimedia glosses were able to enhance immediate vocabulary learning and vocabulary retention. The results indicated that the text and picture mode group performed significantly better than the text mode group in immediate vocabulary test and delayed vocabulary test. In order to examine the effect of Modality principle via multimedia glosses comparison was made between text and picture mode and audio and picture mode and it was discovered that the audio and picture mode was more superior compared to text and picture mode. The audio and picture treatment mode group performed significantly better than the text

and picture treatment mode group in immediate vocabulary test and delayed vocabulary test. This showed that Modality Principle helps in enhancing both immediate vocabulary learning and vocabulary retention compared to Multimedia Principle. In terms of interaction effects between treatment modes and proficiency levels, there were significant interaction effects between the treatment modes (T and TP) and proficiency levels (High (H), Medium (M) and Low (L)) in both immediate vocabulary learning and vocabulary retention. However, the interaction effects between treatment modes (TP and AP) and proficiency levels (High (H), Medium (M) and Low (L) were not significant in both immediate vocabulary learning and vocabulary retention. The application of Modality principle in developing English Language teaching and learning resources is able to generate a dynamic and motivated approach in learning vocabulary.

# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction

Vocabulary is one of the important aspects which need to be mastered by learners in learning a language (Cameron, 2001). According to Neuman and Dwyer (2009), vocabulary is defined as words that learners must acquire in order to communicate efficiently which includes words which are used in both speaking and listening. Vocabulary learning is important when learning a second language. It creates a challenging task among L2 learners as well as teachers in teaching vocabulary.

Nagy (2006) stated that vocabulary learning is a tough process because students' motivation is important in learning vocabulary. Students also need to engage in vocabulary instruction and achieve the appropriate levels and standards of vocabulary learning in order to obtain the required achievement. Vocabulary learning is a never ending process because it is an ultimate and natural experience (Smith, 1998). Vocabulary learning is a frequent process of coming across new words in comprehensible contexts (Harmon, Wood & Kiser, 2009).

Vocabulary should be identified as a central component in language instruction from the beginning stages. Schmitt (2010) stated that it is certain that vocabulary learning is a vital element to master a language. Developing one's vocabulary is also a priority, but at the same time it is a constant challenge for L2 learners (Waring & Nation, 2004). This shows that learners with inadequate

vocabulary knowledge will face difficulties in learning the second language which will definitely affect the learners. This is why, in the process of second language learning, learning vocabulary is one of the challenges which learners have to endure. Chung and Nation (2004) proposed that in order to comprehend the technical words which were one of the components in academic texts, the use of effective strategies help in enhancing students' understanding. In addition, Sarani and Kafipour (2008) discovered that students do not have enough skills and suitable learning strategy in learning vocabulary.

Nation (2001) emphasizes that in the development and advancement of computers and technology in language learning, computers become one of the effective ways in learning vocabulary. This was shown in a study conducted by Rezaee and Shoar (2011) which revealed that technology and multimedia can be one of the great instructional values to instructors, program designers and most importantly the language learners. The learner-centred environment which could be modified based on learners types could be created when technology and multimedia are used in the teaching and learning process. It also could support the teachers by providing adequate materials that are practical.

In country such as Malaysia, English is taught as a second language in schools and as stated in Article 152, the Malaysian government has classified English as a second language status (Kesumawati, Nor Zakiah, Norsimah & Nor Hashimah, 2007). English Language is a compulsory subject in both primary and secondary schools in Malaysia. Vocabulary is always claimed as the toughest language skill to learn among Malaysia students. When students have inadequate vocabulary the

learning process will be interrupted due to the difficulties in understanding the texts. As argued by Sedita (2005), students' vocabulary knowledge is related to their educational performance. He also pointed out that those students with ample vocabulary range are able to comprehend new ideas faster than those with limited knowledge on vocabulary. Moreover, Thornbury (2002) argues that, rather than focusing too much on grammar, attention should be given on learning more words since it helps in the development of learners' language.

A study carried out by Becta (2001) revealed that integration of ICT in the teaching and learning of English can lead to higher achievement besides providing motivation. A suitable multimedia learning tool may offer opportunities for Malaysian students to develop their English skill competencies to a higher level. Since it is possible to present a variety of glosses in the form of text, audio, picture and video in a multimedia environment, it is crucial and essential to investigate whether glosses help in assisting vocabulary learning. Glosses are used to facilitate comprehension in L2 reading materials and vocabulary acquisition appears as by-product (Azari, 2016; Gan, 2014; Shalmani & Razmjoo, 2015).

Glosses are able to attract learner attention for a moment from reading and learner will focus on the meaning of the glossed words which develop vocabulary learning and overall reading comprehension. According to Blemiller (2001), reading comprehension and vocabulary knowledge are strongly connected. It was found that the vocabulary knowledge in primary school can predict students' ability in comprehending the reading texts they read in high school (Hodkinson, Kenneth & Adams, 2001).

Based on a study conducted by Azari (2016) it was found that students who were exposed to a multimedia gloss were able to retain more words compared to those who worked with paper gloss. Unlike traditional glossing, the use of images, video and sound through multimedia annotations can be beneficial for learners (Hamidreza, Ghonsooly & Ghabanchi,2014). Learners may show satisfying progress and reach better proficiency level in the target language, if vocabulary learning can be learned in a more interesting and effective way with the support of Cognitive Theory of Multimedia Learning, multimedia principle and modality principle. This study attempts to investigate a vocabulary learning treatment in assisting students to learn new words and retain them.

## 1.2 Background

In general, English language seems to be one of the languages that everyone understands and is widely used in most parts of the world. This makes English an international language which are used in many areas such as communication, entertainment and others. However, schools and higher institutions students in non-native English speaking countries such as Asian countries have to face the challenge to educate and speak appropriately with the learners who are unable to speak English language. One of the most essential elements in second or foreign language acquisition is vocabulary learning (Schmitt & McCarthy, 1997). Numerous researches have been conducted in the area of second language learning in the last few decades which holds the idea that when learners use and utilize more words, they will become successful language learners (Zhi-liang, 2010; Ghazal, 2007).

Students will have the ability to use precise words in expressing their ideas in writing when they have adequate vocabulary items in their repertoire which will also allow them to do well according to the standard levels of performance. There have been a number of studies carried out relating to the declining standard of ESL in Malaysia. Ghazal (2007) stated that one of the main challenges faced by language learners is vocabulary learning. Having inadequate vocabulary knowledge will definitely affect the four language skills, reading, listening, speaking and writing. Learning new words and retaining them are also one of the problems faced by students. In order to overcome this problem, L2 learners adopt a variety of strategies to remember the words. For example, paired associations or word lists are some of the strategies which are often used in vocabulary learning. Learners need to memorize pair associations when using these strategies (Sun & Dong, 2004).

According to Ambigapathy (2002), it was depressing to find out that the drilling technique using past-year examination questions or worksheets is the most popular teaching method used in schools. Hassan and Fauzee (2002) also revealed that from nine language activities used in an English lesson, vocabulary exercises were ranked fourth. In another related study carried out by Teh (2004) showed that in the students' preference list, vocabulary learning falls in the lowest ranked among other language activities. It was also discovered that certain language skills are neglected because students are reported to master numerous grammatical skills, which will be assessed in examination (Ambigapathy, 2002). Furthermore, the learning setting is more teacher-centered and teachers applied the chalk-and-talk method (Ministry of Education, 2003). If teachers could use information technology to show teaching material with audio-visual animation effect, then the learners'

motivation aroused and the learners could understand and be familiar with what they learn more (Lu, 2010). Vocabulary knowledge seemed to be neglected in classroom teaching and changes have to be done to enhance students' vocabulary.

The aim of this research is to examine the impact of Multimedia and Modality Principles via multimedia glosses among Form Four students with different proficiency level in MRSM, Maktab Rendah Sains MARA (in Malay), MARA Junior Science College (in translation). MRSM is a cluster of boarding schools scattered in 13 states of Malaysia. The MRSM schools were established in 1972 with the aim of offering better learning for bright Malaysian students. Although these students are selected students their proficiency levels in English are varied from high proficiency, medium proficiency and low proficiency students. Majority of these students scored A in Science and Mathematics in the PT3 (Pentaksiran Tingkatan 3) national examination but not in English. Majority of them do not have good grasp in English language. Hence, it is important to develop a programme to assist teachers in improving students' English proficiency levels.

The accessibility and development of computer technology has expanded the options for enhancing students' vocabulary knowledge. The use of multimedia technology such as dynamic and static visuals, audio and video expands the ways of presenting vocabulary meanings. Glosses types are varied now and are not restricted to text gloss only due to the advancement of multimedia technology. Images, audio and video could be integrated in creating and developing multimedia glosses. Lenders (2008) stated that multimedia glosses could motivate and draw learners'

attention in learning English language. Multimedia glosses also are able to facilitate vocabulary learning, especially when authentic and meaningful texts are used.

There are lots of advantages when computers and multimedia are used in second language instruction. These tools create interaction between learners and materials which offer immediate feedback and fulfill the learners' needs in the affective domain. In addition, the use of computers and multimedia allows language teachers to use authentic materials and introduce new words via computer vocabulary teaching programs or software (Lu, 2010; Peng & Jing, 2007). Sun and Dong (2004) also indicated that the rapid advancement of multimedia computers as learning tools help in creating and developing more effective and attractive language learning activities. Creation of an authentic and attractive language activity or exercise could be presented to students by integrating static visual, dynamic visual, audio and video.

Glossing is one of the methods which could enhance the development of vocabulary knowledge (Rott, 2005; Rott, Williams, & Cameron, 2002). Hence, the use of glossing in reading materials should be utilized to assist students in understanding the text comprehension and facilitate incidental vocabulary learning through reading especially among low and medium proficiency students in particular the poor readers. Gloss is actually a substitute for the traditional dictionary. If students use the dictionaries they have to switch focus from the reading texts to dictionaries in order to search for the meaning of unfamiliar words which might take more time and effort. For that reason, utilizing glosses in reading materials can contribute to second language learners' vocabulary development.

Among various types of glosses, the current study pays particular attention on text gloss, text and picture gloss and audio and picture gloss. These glosses are developed based on two principles under Cognitive Theory of Multimedia Learning which are the Multimedia and Modality Principles. The application of Multimedia and Modality Principles in computer based learning could improve vocabulary learning. Multimedia and Modality Principles offer a practical approach if they are integrated into computer-based learning as the instructional design (Mayer, 2001).

This study is one of the researcher's efforts to solve the problem of vocabulary learning. Through her 17 years teaching experience in MRSM, it was found that students were unable to write accurately to the extent that errors made were multiple in nature. It was difficult for the students with limited vocabulary to complete their writing tasks on time and understanding the comprehension text. As mentioned earlier, one of the effective methods in facilitating vocabulary learning is 'Glossing'.

## 1.3 Problem Statement

There are many factors that may affect Malaysian students' low English language learning proficiency eventhough they have gone through 11 years of learning English in school (Naginder, 2006: Nor Hashimah Jallaudin, Norsimah Mat Awal & Kesumawati Abu Bakar, 2008). Low (2004, cited in Zakaria, 2005) revealed that due to lack of vocabulary, L2 learners in Malaysia have difficulties in mastering the the four language skills. According to Ratnawati and Ismail (2003), students also found it difficult to express themselves in English when they have limited

vocabulary. It is challenging for them to guess the meaning of unfamiliar words in context when they attempt reading tasks.

In addition, students tend to forget newly learned words quickly. Learner can only learn limited number of words at one time and it is easier to forget a word than to remember it. According to Leeke and Shaw (2000) and Yoshii and Flaitz (2002), initial word knowledge is very fragile and when the words are not met again soon, memories of those words are lost and learners fail to recall these words in speaking and writing task but also in reading comprehension. This situation has become one of the major problems in acquiring new words and long-term retention has been given more attention in studies related to vocabulary learning.

Learning difficulty may occur due to different proficiency levels among language learners. Less proficient students in secondary schools have trouble in understanding the materials which have been assigned to them because of having limited vocabulary and unable to master the language structures (Latsanyphone & Bouangeune, 2009). Evidence from preliminary studies showed that the limited vocabulary contributes to students' incapability to cope with the four language skills (Naginder & Kabilan, 2007; Pillai, 2004). Based on the Analysis of Quality of Answers SPM 2015 by the Malaysian Examination Board, Ministry of Education Malaysia (2015), candidates with average achievement and low achievement groups understood the requirements of the task, but lack of vocabulary to write effectively. Students' vocabulary was limited therefore they failed to elaborate the points and they have the tendency to use the same words and sentence structure are not varied

too. Among very weak candidates, there was a noticeable use of Bahasa Malaysia and interference from their mother tongue.

There are numerous ways to introduce new words in a reading comprehension passage and glossing is discovered as one of the outstanding methods to assist vocabulary learning (Abraham, 2008; Azari & Giahpoor, 2014; Farvardin & Biria, 2012; Hamidreza, Ghonsooly & Ghanbandi, 2014; Hong, 2010; Sato, 2014; Shahrokni , 2009). Although, many studies have been carried to investigate the effects of different types of gloss on vocabulary acquisition (Akbulut, 2007; Ben Salem, 2006; Gan, 2014; Sato, 2016; Shalmani & Razmjoo, 2015; Yoshii, 2006) very few studies look at the effectiveness of audio gloss in vocabulary learning. Besides, most of the researches on gloss focus on the higher institution students such as university and little is known about the primary and secondary level students. Despite various studies which have been conducted on glosses, there are inconsistencies in the findings which show discrepancy in the effectiveness of glosses on vocabulary learning and retention. Chun (2006) also agreed that most results of hypermedia annotation studies were inconsistent, which do not provide significant evidence.

Hence, there is a need to explore the ways in raising the Malaysian learners' language proficiency particularly in vocabulary acquisition. Learners need to be given the opportunity to control their learning processes which would also allow them to be more responsible. Therefore, the current research was conducted to investigate the impact of Multimedia and Modality principles via multimedia glosses (text, text and picture and audio and picture) among students' with different

proficiency level (high, medium and low) in immediate vocabulary learning and vocabulary retention.

## 1.4 Rationale of Study

Inspired by previous researches on multimedia glosses and due to the gaps found in this literature, the question addresses in this study was how Multimedia and Modality Principles affect vocabulary learning and vocabulary retention among students with different proficiency levels.

Despite the positive impact of multimedia glosses in immediate vocabulary learning and retention, they are not widely practiced in Malaysia schools. The commonly used strategy by the learners is guessing meaning from contextual clues. They also check the meaning of unfamiliar words using dictionary when they discover a lot of unknown words which disrupts their reading and distract their attentions. However, readers may have the possibility to choose the inaccurate meaning since there are numerous definitions found in a dictionary. If learners have limited vocabulary, the technique of guessing or inferencing is not suitable for them because they might make incorrect inferences. It is also a difficult and challenging task for them, therefore a suitable approach should be used to help them learn English vocabulary.

This research was designed to expand the effectiveness of practicing multimedia learning in second language learning under the framework of Cognitive Theory of Multimedia Learning. The types of treatment modes to be examined

include three combinations of multimedia glosses: a) text (T); b) text and picture (TP) ; and c) audio and picture (AP). Specifically, the current study will examine the effects of these two principles via multimedia glosses in immediate vocabulary learning and vocabulary retention among Form Four students with different proficiency levels in Malaysia.

## 1.5 Research Objectives

The main objectives of this study are:

1) To design and develop 3 modes of courseware [text (T); text and picture (TP); and audio and picture (AP)] in vocabulary learning and retention.

2) a) To evaluate the effect of Multimedia Principle (T and TP modes) on vocabulary learning when measured immediately after the intervention.

   b) To determine the interaction effects between treatment modes (T and TP) and students' proficiency levels (H, M and L) on immediate vocabulary learning.

3) a) To evaluate the effect of Multimedia Principle (T and TP modes) on vocabulary retention when measured two weeks after the intervention.

   b) To determine the interaction effects between treatment modes (T and TP) and students' proficiency levels (H, M and L) on vocabulary retention.

4) a) To evaluate the effect of Modality Principle (TP and AP modes) on vocabulary learning when measured immediately after the intervention.

b) To determine the interaction effects between treatment modes (TP and AP) and students' proficiency (H, M and L) on immediate vocabulary learning.

5) a) To evaluate the impact of Modality Principle (TP and AP) on vocabulary retention when measured two weeks after the intervention.

b) To determine the interaction effects between treatment modes (TP and AP) and students' proficiency (H, M and L) on vocabulary retention.

## 1.6 Research Questions

To achieve the objectives of this study, the following research questions are pursued:

1) a) Is there a significant difference in the students' immediate posttest scores between T mode and TP mode?

b) Is there any interaction effect between the treatment modes (T and TP) and proficiency levels (H, M and L) on students' immediate posttest scores?

2) a) Is there any significant difference in the students' delayed posttest scores between T mode and TP mode?

b) Is there any interaction effect between the treatment modes (T and TP) and proficiency levels (H, M and L) on students' delayed posttest scores?

3) a) Is there any significant difference in the students' immediate posttest score between TP mode and AP mode ?

b) Is there any interaction effect between the treatment modes (TP and AP) and proficiency levels (H, M and L) on students' immediate posttest scores?

4) a) Is there any significant difference in the students' delayed posttest scores between TP mode and AP mode?

b) Is there any interaction effect between the treatment modes (TP and AP) and proficiency levels (H, M and L) on students' delayed posttest scores?

## 1.7 Hypotheses

The purpose of this study is to investigate the impact of Multimedia and Modality Principles via multimedia glosses on vocabulary learning and vocabulary retention among students' with different proficiency level. Therefore, the following null hypotheses are addressed:

$H_o$ 1a

There is no significant difference in the students' immediate posttest scores between T mode and TP mode.

$H_o$ 1b

There is no significant interaction effect between the treatment modes (T and TP) and proficiency levels (H, M and L) on students' immediate posttest scores.

$H_o$ 2a

There is no significant difference in the students' delayed posttest scores between T mode and TP mode.

$H_o$ 2b

There is no significant interaction effect between the treatment modes (T and TP) and proficiency levels (H, M and L) on students' delayed posttest scores.

$H_o$ 3a

There is no significant difference in the students' immediate posttest scores between TP mode and AP mode.

$H_o$ 3b

There is no significant interaction effect between the treatment modes (TP and AP) and proficiency levels (H, M and L) on students' immediate posttest scores.

$H_o$ 4a

There is no significant difference in the students' delayed posttest scores between TP mode and AP mode.

$H_o$ 4b

There is no significant interaction effect between the treatment modes (TP and AP) and proficiency levels (H, M and L) on students' delayed posttest scores.

## 1.8 Significance of Study

Despite the number of studies regarding the impact of different combinations of multimedia gloss components on immediate vocabulary learning and vocabulary retention, the findings are mixed and inconsistent. For example, while the results of

Chun and Plass's (1996) study showed that text and video glosses were not as effective as text and picture were more effective for recalling words, the results of Al-Seghayer's (2001) study show the opposite results. The differences in learning effects occur due to the learning difficulties which are imposed by variety of words used and not because of the glosses types (Akbulut, 2007). This study was carried out for theoretical and practical reasons. The aim of this study is to contribute to the growing of studies on multimedia in second language learning in particular in vocabulary learning and retention.

There are also limited numbers of studies that have examined the impact of audio as a useful media type that may enhance the effect of multimedia glosses. It is important to determine if combinations of text and picture, text and audio or audio, text, and picture would best help students recall words, as that increases the number of input channels. Since the number of learners who read electronic texts either from the internet or software is increasing, it is important to provide certain guidance in the development of new glossed texts. It is vital for designers to know which combination is the most efficient: text; text and picture; or audio and picture.

The use of these three combinations in a story created by the researcher is also one of the reasons that make this study significant and unique. The stories of this study will focus on descriptive and narrative stories and not on existing reading materials as many researchers have used. Therefore, the target words and story will be relevant to increase students' vocabulary in writing better descriptive and narrative essays in particular.

Another purpose of this study is to contribute to the studies on multimedia glosses and vocabulary learning. First, it provides essential information on the use of audio gloss on immediate vocabulary learning and retention. Second, it also enlightens on the use of different combinations of multimedia glosses in learning vocabulary. Third, it also expands to the growth of studies on Cognitive Theory of Multimedia Learning. In addition, this study presents useful information for material designers in deciding the suitable combination of glosses in facilitating immediate vocabulary learning and retention according to students' proficiency levels. It also justifies the importance of using multimedia programmes in Malaysia schools which helps in enhancing vocabulary learning among second language learners. So, it is necessary for language teachers and school administrations to make exact decisions about this matter.

As an international language, English language has an essential role in the field of education. It is reasonable to search for significant approaches to improve the level of English among Malaysian students. The discovery of innovative and exciting ways to handle the difficulty of learning English in schools can be implemented in the curriculum. This will change the traditional classroom settings to a more interesting and attractive environment. In addition, students would have the chance to access to the materials at home or any places at any time.

## 1.9 Operational Definitions

1. Gloss/Annotation : A brief definition or synonym or a short explanation of meaning given to an unknown L2 word during reading. Traditionally, a gloss

is provided in the margin of the text or at the end of the text. In a multimedia setting, a gloss is linked to a hypertext. In this study, the words "annotation" and "gloss" are used interchangeably.

2. Multimedia Principle : A principle studied in depth by Mayer (2001) that states students learn better from words and pictures, than from text or graphic alone.

3. Modality Principle : A principle studied in depth by Mayer (2001) that states students learn better from graphics and narration than from graphics and on-screen text.

4. Proficiency Level : Students' levels of performance in the English Proficiency Test which was developed by Secondary Education Division of MARA , English Language Department. It is administered in all MRSM to identify the Form Four students' proficiency levels once they entered Form Four.

5. Incidental Vocabulary Learning : Vocabulary learning that occurs incidentally during the process of reading in a second language. In other words, the learners learn the word unintentionally when they are engaged in a reading or listening task.

6. Text gloss/annotation : A gloss in a written text. In a multimedia text, a text gloss is accessible upon clicking the unknown word. It appears in a pop-up window and does not block the text section where the word is embedded.

7. Text and Picture gloss/annotation : A multimedia gloss that uses written text and relevant picture to clarify the meaning or description of an unknown word.

8. Audio and Picture gloss/annotation : A multimedia gloss that uses spoken text (voice of a local speaker of the L2) and relevant picture. The spoken text is the pronunciation and a short definition of the word.
9. Immediate vocabulary learning : ability to recognize and recall the word meaning after one exposure of the word in reading context. In this study the immediate vocabulary learning is measured immediately after the treatment.
10. Vocabulary retention : ability to provide the meaning of a word after a given period of time. In this study the retention is measured two weeks after the treatment.

## 1.10 Limitations

This study focused on immediate vocabulary learning and vocabulary retention therefore, other language learning skills such as writing and speaking were not included. The participants were Form Four students (secondary level), therefore, learners at the elementary or primary levels were excluded. The reading texts were written specifically in their content and length for the research study, which caters students with different proficiency levels.

Thirty target words in the six different texts were highlighted and glossed. The materials for TP and AP treatment modes had to include words that could be visualized using relevant pictures to accomplish the objectives of the study. Therefore there are limitations in choosing the words to be glossed because there were limited pictures which are relevant for some of the targeted words.

The audio gloss in this study comprised of a spoken text of the word and definition of the glossed word by a local speaker. Therefore, the auditory modality in this case was limited to spoken texts which provide the pronunciation of the targeted words and the definition only.

The study was limited to several MARA Junior Science Colleges in the northern zone in Malaysia. The sample for the study was drawn from that specific population, therefore the results from the study might not generalize to other schools or regions in Malaysia.

## 1.11 Chapter Summary

This research is designed to investigate the impact of multimedia and Modality Principles via three modes of multimedia glosses (T, TP and AP) that might be able to help students with different proficiency levels (H, M and L) acquire new vocabulary and retain them. Research has shown that vocabulary can be picked up incidentally while students are engaged in reading for meaning. Researchers have also suggested that using a gloss or annotation can facilitate the process of vocabulary learning as well as vocabulary retention. Many types of glosses have been studied using both primary and secondary language as a basis for the gloss, and both textual and multimedia glosses have been tested extensively in the literature however little is known about audio glosses. Although the effects have glosses have been validated by some research studies, the results were not consistent.