



**UNIVERSITI PUTRA MALAYSIA**

**EFFECTS OF MULTIMEDIA ANNOTATIONS ON READING COMPREHENSION  
AND INCIDENTAL VOCABULARY ACQUISITION OF MALAYSIAN TERTIARY ESL  
STUDENTS**

**NANCY TAN CHIEW HA**

**FPP 2014 15**



**EFFECTS OF MULTIMEDIA ANNOTATIONS ON READING  
COMPREHENSION AND INCIDENTAL VOCABULARY ACQUISITION  
OF MALAYSIAN TERTIARY ESL STUDENTS**

By

**NANCY TAN CHIEW HA**

**Thesis Submitted to the School of Graduate Studies,  
Universiti Putra Malaysia, in Fulfilment of the  
Requirements for the Degree of Doctor of Philosophy**

**February 2014**

## **COPYRIGHT**

All material contained within the thesis, including without limitation text, logos, icons, photographs and all other artwork, is copyright material of Universiti Putra Malaysia unless otherwise stated. Use may be made of any material contained within the thesis for non-commercial purposes from the copyright holder. Commercial use of material may only be made with the express, prior, written permission of Universiti Putra Malaysia.

Copyright © Universiti Putra Malaysia



## DEDICATIONS

This dissertation is especially dedicated to my beloved husband, Tay Yew Guan;  
my three beautiful sons, Theng Hong, Theng Min and Theng Zhe;  
my late dad, Mr. Tan Thian Hua  
and my dearest mum, Mdm Lee Geok Hoon

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

**EFFECTS OF MULTIMEDIA ANNOTATIONS ON READING  
COMPREHENSION AND INCIDENTAL VOCABULARY ACQUISITION  
OF MALAYSIAN TERTIARY ESL STUDENTS**

By

**NANCY TAN CHIEW HA**

**February 2014**

**Chair : Associate Professor Wong Su Luan, PhD**  
**Faculty : Educational Studies**

This study investigated the effects of different types of multimedia annotations on reading comprehension and incidental vocabulary acquisition among learners of English as a second language whose English language proficiency is of intermediate level. The subjects were one hundred and twenty eight second and third semester college students enrolled in a teacher-training institute. The subjects were directed to read an electronic reading text in English containing thirty annotated words. Each participant read the text under one of the following conditions: No annotation (Control group), Audio annotation (A group), Audio-Text annotation (AT group), Audio-Picture annotation (AP group) and Audio-Picture-Text annotation (APT group).

The instrument used for data collection was a set of reading comprehension test and a set of vocabulary test. The reading comprehension test comprised thirty multiple-choice questions and ten open-ended subjective comprehension questions. The vocabulary test measured the research participants' ability to recall the meanings of all the target words and to use them in writing (vocabulary production). Two posttests were conducted to compare the research participants' achievement. The first posttest was carried out immediately after the participants had finished reading the comprehension text assigned to them. The second posttest was administered three weeks later to measure reading comprehension and word retention.

The results showed that there was no statistical difference in the reading comprehension, vocabulary recall, and vocabulary production scores between the control group and the multimedia annotation groups across all test points (pretest,

immediate posttest, delayed posttest). As for the multimedia-annotation groups, it was found that all multimedia annotations, except audio only format, did increase reading comprehension, vocabulary recall, and vocabulary production scores of the participants. The findings also indicated that among the multimedia annotation configurations, the more annotation format and annotation mode utilized corresponded to higher reading comprehension, vocabulary recall, and vocabulary production scores in immediate and delayed posttests. It was therefore established that all multimedia annotations presented except for audio only format, did indeed have a significant effect in improving reading comprehension and incidental vocabulary acquisition of the research participants.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**KESAN ANOTASI MULTIMEDIA TERHADAP PENCAPAIAN  
KEFAHAMAN MEMBACA DAN PENGUASAAN KOSA KATA DALAM  
KALANGAN PELAJAR BAHASA INGGERIS SEBAGAI BAHASA KEDUA  
DI PERINGKAT TERTIARI MALAYSIA**

Oleh

**NANCY TAN CHIEW HA**

**Februari 2014**

**Pengerusi : Associate Professor Wong Su Luan, PhD**  
**Fakulti : Pengajian Pendidikan**

Kajian ini mengkaji kesan jenis anotasi multimedia terhadap pemahaman membaca dan pemerolehan kosa kata dalam kalangan pelajar berkecekapan Bahasa Inggeris peringkat sederhana yang mengikut program Bahasa Inggeris sebagai Bahasa Kedua. Subjek kajian terdiri daripada 128 pelajar di sebuah Institut Pengajian Guru yang berada dalam semester kedua dan semester ketiga. Subjek kajian diminta untuk membaca teks elektronik Bahasa Inggeris yang mengandungi tiga puluh perkataan beranotasi. Setiap subjek kajian membaca teks di bawah salah satu daripada syarat-syarat berikut: Tiada Anotasi (kumpulan kawalan), Anotasi Audio (kumpulan A), Anotasi Audio-Teks (kumpulan AT), Anotasi Audio-Gambar (kumpulan AP) dan Anotasi Audio-Gambar-Teks (kumpulan APT).

Instrumen kajian yang digunakan untuk mengumpul data terdiri daripada satu set ujian kefahaman dan satu set ujian kosa kata. Ujian kefahaman meliputi tiga puluh soalan beraneka pilihan dan sepuluh soalan kefahaman subjektif. Ujian perbendaharaan kata menguji subjek kajian samada mereka boleh mengingat semula semua makna perkataan sasaran, dan samada mereka boleh menggunakan perkataan sasaran itu dalam penulisan. Dua ujian pasca dijalankan untuk membandingkan pencapaian subjek kajian. Ujian pasca pertama dijalankan seurus subjek kajian habis membaca teks yang diberi. Ujian pasca yang kedua diberi tiga minggu kemudian untuk mengukur pengekalannya.

Hasil kajian menunjukkan bahawa tidak terdapat perbezaan statistik secara signifikan dalam skor kefahaman membaca, mengingat semula kosa kata, dan penggunaan kosa kata untuk ujian pra dan ujian pasca. Bagi kumpulan anotasi multimedia, didapati

bahawa terdapat peningkatan skor bagi kefahaman membaca, mengingat semula kosa kata, dan penggunaan kosa kata para peserta semua kumpulan kecuali kumpulan yang diberi anotasi audio. Hasil kajian juga menunjukkan bahawa konfigurasi anotasi multimedia berbagai format dan mod membawa kepada kefahaman membaca yang lebih tinggi serta meningkatkan daya mengingat semula kosa kata, dan penggunaan kosa kata dalam kedua-dua ujian pasca. Oleh itu, ia telah dibuktikan bahawa semua anotasi multimedia kecuali format audio, memang mendatangkan kesan positif dalam meningkatkan kefahaman membaca dan pemerolehan kosa kata di antara subjek kajian.





## ACKNOWLEDGEMENTS

I wish to express my utmost appreciation to my supervisory committee for their unwavering support and encouragement throughout my graduate study at Universiti Putra Malaysia. I would like to especially thank my former thesis chair Dr. Fauziah Hassan (who has since retired) for her understanding and insightful feedback. Her unfailing confidence in me has bolstered me up in times of uncertainties and tears.

Furthermore, I wish to express my gratitude to my present supervisor Associate Professor Dr. Wong Su Luan for offering me immense support, encouragement and guidance on every aspect of my dissertation work. Her help and professional advice has contributed greatly to the completion of this dissertation. My heartfelt appreciation also goes to my two supervisory committee members, Professor Dr. Kamariah Bt Abu Bakar and Dr. Habsah Bt Hussin for their invaluable suggestions.

I am also particularly grateful my two test assistants who had put in a lot of time and effort in assisting me vet and score the reading test, and in helping me conduct the pretest and posttests. I am greatly indebted to En Ghazali bin Hj Mustapha, an English language lecturer at Institut Pendidikan Guru Raja Melewar for his help in arranging for the test venues and the research participants. Without his help, this dissertation would not have materialized.

I am eternally grateful to my husband and three sons. Their love, support and understanding have made the grueling years throughout my study bearable and helped me surmount challenges that would surely have overwhelmed me if I had faced them alone. I love them with all of my heart.

Lastly, this dissertation is especially dedicated to my late father who believed in me, and to my mum, brothers and sisters for encouraging me throughout a sometimes thorny path. I may never walk this path again, but having walked through it, my life has been enriched and transformed.

I certify that a Thesis Examination Committee has met on 28 February 2014 to conduct the final examination of Nancy Tan Chiew Ha on her thesis entitled "Effects of Multimedia Annotations on Reading Comprehension and Incidental Vocabulary Acquisition of Malaysian Tertiary ESL Students" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U. (A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

Members of the Thesis Examination Committee were as follows:

**Rosnaini binti Mahmud, PhD**

Senior Lecturer  
Faculty of Educational Studies  
Universiti Putra Malaysia  
(Chairman)

**Roselan bin Baki, PhD**

Senior Lecturer  
Faculty of Educational Studies  
Universiti Putra Malaysia  
(Internal Examiner)

**Arshad bin Abd. Samad, PhD**

Associate Professor  
Faculty of Educational Studies  
Universiti Putra Malaysia  
(Internal Examiner)

**Gary Motteram, PhD**

Professor  
The University of Manchester  
United Kingdom  
(External Examiner)

---

**NORITAH OMAR, PhD**

Associate Professor and Deputy Dean  
School of Graduate Studies  
Universiti Putra Malaysia

Date: 23 June 2014

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

**Wong Su Luan, PhD**

Associate Professor  
Faculty of Educational Studies  
Universiti Putra Malaysia  
(Chairman)

**Kamariah Bt. Abu Bakar, PhD**

Professor  
Faculty of Science  
Universiti Putra Malaysia  
(Member)

**Habsah Bt Hussin, PhD**

Lecturer  
Faculty of Educational Studies  
Universiti Putra Malaysia  
(Member)

**BUJANG BIN KIM HUAT, PhD**

Professor and Dean  
School of Graduate Studies  
Universiti Putra Malaysia

Date:

## Declaration by graduate student

I hereby confirm that:

- this thesis is my original work;
- quotations, illustrations and citations have been duly referenced;
- this thesis has not been submitted previously or concurrently for any other degree at any other institutions;
- intellectual property from the thesis and copyright of thesis are fully-owned by Universiti Putra Malaysia, as according to the Universiti Putra Malaysia (Research) Rules 2012;
- written permission must be obtained from supervisor and the office of Deputy Vice-Chancellor (Research and Innovation) before thesis is published (in the form of written, printed or in electronic form) including books, journals, modules, proceedings, popular writings, seminar papers, manuscripts, posters, reports, lecture notes, learning modules or any other materials as stated in the Universiti Putra Malaysia (Research) Rules 2012;
- there is no plagiarism or data falsification/fabrication in the thesis, and scholarly integrity is upheld as according to the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) and the Universiti Putra Malaysia (Research) Rules 2012. The thesis has undergone plagiarism detection software.

Signature:

Date: \_\_\_\_\_

Name and Matric No.: Nancy Tan Chiew Ha / GS15192



## Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

Signature: \_\_\_\_\_

Name of Chairman of

Supervisory Committee: WONG SU LUAN, PhD

Signature: \_\_\_\_\_

Name of Member of

Supervisory Committee: KAMARIAH BT ABU BAKAR, PhD

Signature: \_\_\_\_\_

Name of Member of

Supervisory Committee: HABSAH BT HUSSIN, PhD

## TABLE OF CONTENTS

	Page
<b>DEDICATION</b>	ii
<b>ABSTRACT</b>	iii
<b>ABSTRAK</b>	v
<b>ACKNOWLEDGEMENTS</b>	vii
<b>APPROVAL</b>	viii
<b>DECLARATION</b>	x
<b>LIST OF TABLES</b>	xvi
<b>LIST OF FIGURES</b>	xviii
<b>LIST OF ABBREVIATIONS</b>	xix

### CHAPTER

<b>I</b>	<b>INTRODUCTION</b>	
	Introduction	1
	Background of the Study	1
	Importance of vocabulary knowledge in reading comprehension	2
	Issues related to the teaching of second language vocabulary	2
	The role of computers in second language reading comprehension and vocabulary acquisition	3
	Statement of the Problem	4
	Purpose and Objective of Study	5
	Research Questions	6
	Significance of Study	7
	Limitations of the Study	8
	Operational Definition of Terms	9
	Summary	11
<b>2</b>	<b>REVIEW OF RELATED LITERATURE</b>	
	Introduction	12
	Constructivist Theory of Reading	12
	Constructivism and technology	18
	Theory of Multimedia Learning	20
	Generative theory of learning	20
	Dual-coding theory	21
	Cognitive load theory	23
	Cognitive theory of multimedia learning	24

Extension of cognitive theory of multimedia learning to second language learning	26
Application of cognitive theory of multimedia learning to multimedia annotation	27
Second Language Vocabulary Acquisition	28
Relationship between reading comprehension and vocabulary learning	29
Vocabulary breadth and vocabulary depth	32
Vocabulary breadth	33
Second language vocabulary learning: Incidental or intentional?	33
Incidental Vocabulary Acquisition and L2 Reading Proficiency	40
Processing Annotations and Vocabulary Retention	42
Hypertext annotations	45
Value and effect of hypertext glosses	45
Types of glosses	48
Types of multimedia annotations	49
Annotation in printed texts and second language vocabulary learning	50
Multimedia annotations and second language vocabulary learning	52
Annotation in printed text and second language reading comprehension	56
Multimedia annotations and second language reading comprehension	57
Theoretical Basis of the Study	61
Conceptual Framework	63
Summary	64
<b>3 RESEARCH METHODOLOGY</b>	
Introduction	65
Research Design	65
Validity of Research Design	66
Internal validity	66
External validity	70
Research Setting	71
Participants	71
Instrument	73
Reading text	73
Procedure for annotating the reading text	74
Multimedia annotation programme	75

	Reading comprehension test	77
	Vocabulary test	80
	Needs Analysis and Pilot Study	82
	Experimental Procedure	82
	Research Framework	86
	Data Analysis	87
	Conclusion	87
<b>4</b>	<b>RESULTS AND FINDINGS</b>	
	Introduction	88
	Description of Subjects and Study Variables	89
	Results of Analysis	92
	Comparison of construct scores among different Multimedia annotation groups	92
	Reading comprehension delayed posttest comparison	94
	Vocabulary recall immediate posttest comparison	97
	Vocabulary recall delayed posttest comparison	99
	Vocabulary production immediate posttest comparison	102
	Vocabulary production delayed posttest comparison	104
	Summary of Findings	107
<b>5</b>	<b>DISCUSSION, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS</b>	
	Introduction	108
	Discussions of Findings	108
	The Influence of Multimedia Annotations on Reading Comprehension	108
	The Influence of Multimedia Annotations on Vocabulary Recall	111
	The Influence of Multimedia Annotations on Vocabulary Production	113
	Conclusion	114
	Theoretical Implications	115
	Pedagogical Implications	115
	Recommendations for Future Research	117
	<b>REFERENCES</b>	119
	<b>LIST OF APPENDICES</b>	145
	Appendix A1      Roby's Taxonomy of Glosses	145
	Appendix A2      MUET Aggregates Scores and Banding System	146
	Appendix A3      Sample Size Graph	147
	Appendix A4      Barrett's Taxonomy of Cognitive	148