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UNIVERSITI PUTRA MALAYSIA

# EVALUATION OF SEQUENCED AND UNSEQUENCED ENGLISH FOR SCIENCE AND TECHNOLOGY MATERIALS ON A WEB-BASED LEARNING CONTENT MANAGEMENT SYSTEM PLATFORM

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**By**

**LEE YI-HAU**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia in Fulfilment of the Requirement for the Degree of Master of Arts**

**July 2008**

**Dedicated to my family for their unwavering support which enabled me to complete my Master's program**

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Arts

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**LEE YI-HAU**

**July 2008**

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This study evaluated sequenced online EST materials and unsequenced online EST materials by using a Learning Object Review Instrument (LORI) among post-SPM students in Seri Kembangan, Selangor Darul Ehsan. The study also analyzed the materials design aspects of sequenced and unsequenced EST materials. Both categories of EST materials were analyzed into text types, language knowledge, and key visuals. The sample population comprised 30 post-SPM students split into 2 groups of 15 students each. The test subjects interacted with the EST materials and provided feedback through a two-stage process, namely pre-evaluation and post-evaluation. The first group interacted with LODAS unsequenced EST materials at the pre-evaluation stage and sequenced EST materials at the post-evaluation point a week later. The second group interacted with LODAS sequenced EST materials and unsequenced EST materials at the pre-evaluation and post-evaluation phase respectively a week

later. An intra-group reliability test among the test subjects using Wilcoxon Signed Ranks Test in SPSS was conducted.

The study showed clear preferences for sequenced EST materials when responses from the four subscales of LORI were analyzed. Intra-group reliability test were found to be reliable. On the issue of materials design, data analysis on both groups of test subjects supported the view that sequenced EST materials assisted in the EST materials design.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sastera

**PENILAIAN BAHAN TURUTAN DAN TANPA TURUTAN ["ENGLISH FOR SCIENCE AND TECHNOLOGY" (EST)] DALAM PELANTAR LAMAN WEB "LEARNING CONTENT MANAGEMENT SYSTEM"**

OLEH

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**Pengerusi:** **Profesor Madya Shameem bt. Mohd Rafik Khan @ Rafik-Galea, PhD**

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Kajian ini menilai bahan EST dalam talian turutan LODAS dan bahan EST dalam talian tanpa turutan dengan menggunakan "Learning Object Review Instrument" (LORI) dalam kalangan penuntut pasca SPM yang tinggal di Seri Kembangan, Selangor Darul Ehsan. Kajian ini juga mengendalikan analisis rekabentuk bahan untuk bahan turutan dan tanpa turutan EST dalam talian. Kedua-dua kategori bahan EST ditaksir dari segi jenis teks, pengetahuan bahasa, dan elemen-elemen visual yang penting. Sampel subjek-subjek kajian terdiri daripada 30 penuntut pasca SPM yang dibahagi kepada dua kumpulan. Setiap kumpulan mengandungi 15 penuntut. Subjek-subjek kajian berinteraksi dengan bahan EST turutan LODAS dan memberi maklumbalas melalui dua peringkat, iaitu pra-penilaian dan pasca penilaian. Kumpulan pertama berinteraksi dengan bahan EST yang tidak berturutan pada peringkat pra-penilaian dan bahan EST turutan LODAS pada peringkat pasca penilaian seminggu kemudian. Kumpulan kedua

berinteraksi dengan bahan EST turutan dan tanpa turutan pada peringkat pra-penilaian dan pasca penilaian masing-masing. Ujian reliabiliti antara kumpulan subjek-subjek ujian dijalankan dengan menggunakan Ujian Wilcosxon Signed Ranks dalam SPSS.

Hasil kajian ini mendapati bahawa keempat-empat subskala LORI menunjukkan kecenderungan kepada bahan EST turutan LODAS. Ujian reliabiliti antara subjek-subjek kajian didapati boleh dipercayai. Dari segi rekabentuk bahan, analisis data kedua-dua kumpulan subjek-subjek ujian menyokong pandangan bahawa bahan EST turutan dapat membantu dalam merekabentuk bahan EST.

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This dissertation submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Master in English. The members of the Supervisory Committee are as follows:

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## DECLARATION

I hereby declare that the dissertation is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or at any other institution.

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LEE YI-HAU

## TABLE OF CONTENTS


| | | | |
|---|---|---|---|
| DEDICATION | | | ii |
| ABSTRACT | | | iii |
| ABSTRAK | | | v |
| ACKNOWLEDGEMENTS | | | vii |
| APPROVAL | | | viii |
| DECLARATION | | | x |
| LIST OF TABLES | | | xvi |
| LIST OF FIGURES | | | xviii |
| LIST OF ABBREVIATIONS | | | xix |
| **CHAPTER** | | | |
| **1** | **INTRODUCTION** | | |
| | 1.1 | Introduction | 1 |
| | 1.2 | Background Information | 2 |
| | 1.3 | Problem Statement | 5 |
| | 1.4 | Purpose of Study | 9 |
| | 1.5 | Research Questions | 9 |
| | 1.6 | Significance of the Study | 10 |
| | 1.7 | Limitations | 12 |
| | 1.8 | Definition of Key Terms | 13 |
| | 1.9 | Conclusion | 16 |
| 2 | **REVIEW OF LITERATURE** | | |
| | 2.1 | Introduction | 17 |
| | 2.2 | Theoretical Perspectives | 17 |
| | | 2.2.1 Instructional Design and Learning Theory | 18 |
| | | 2.2.2 LODAS Theory | 20 |
| | | 2.2.3 Goals and Value of LODAS | 21 |
| | | 2.2.4 Sequenced and Unsequenced Content | 28 |
| | | 2.2.5 Summary of LODAS Theory | 29 |
| | 2.3 | Definition of English for Specific Purpose | 30 |
| | 2.4 | Materials Evaluation | 30 |
| | | 2.4.1 Adapting ESP Materials | 33 |
| | | 2.4.2 Adapting EST Materials | 35 |
| | | 2.4.3 Types of ESP | 36 |
| | | 2.4.4. English for Science and Technology (EST) and General English (GE) | 37 |

| | | | |
|---|---|---|---|
| | 2.4.5 | Features of English for Science and Technology (EST) Materials | 38 |
| | 2.4.6 | Linguistic Features of English for Science and Technology (EST) | 38 |
| | 2.4.7 | Modal Auxiliary Verbs | 39 |
| | 2.4.8. | Active and Passive Form | 40 |
| | 2.4.9 | Vocabulary Learning in EST | 41 |
| 2.5 | Materials development in ESP | | 43 |
| | 2.51 | EST Materials Design | 44 |
| | 2.5.2 | Design and Development of EST Materials | 45 |
| | 2.5.3 | DARTS (Directed Activities Related to Text) Model | 47 |
| 2.6 | Scientific Genre Analysis | | 52 |
| | 2.6.1 | Genre and Sequencing | 54 |
| | 2.6.2 | Recontextualization | 55 |
| 2.7 | Information, Communication and Technology (ICT) and Materials Design | | 55 |
| 2.8 | Considerations for Using Online EST Materials | | 57 |
| | 2.8.1 | Learning Content Management System (LCMS) | 57 |
| | 2.8.2 | Human-Computer Interaction (HCI) | 59 |
| | 2.8.3 | Usability and Usability Testing | 61 |
| | 2.8.4 | Cross Cultural Transfer | 64 |
| | 2.8.5 | Flow Chart Summary | 65 |
| 2.9 | Application of Instructional Design Approaches with LODAS and LCMS | | 66 |
| 2.10 | Conceptual Framework for the Study | | 70 |
| 2.11 | Related Studies | | 71 |
| 2.12 | Conclusion | | 79 |

3 **METHODOLOGY**

3.1 Introduction 81
3.2 Research Design 81
3.3 Subjects 84
3.3.1. Demographic Profile 85
3.4 Data Collection Procedures 86
3.4.1. Data Collection and Recording 86
3.4.2. Quantitative Data 87
3.4.3. Summary – Step by Step Guide to the Data Collection and Recording 88
3.5 Instruments 89
3.5.1. Instrument for Discourse Knowledge Framework to Analyze EST Materials – Appendix Q 89
3.5.2. Learning Object Review Instrument (LORI) for the Pre-Evaluation and Post-Evaluation of EST Materials - Appendix D 91
3.5.3. Instrument to Evaluate the Materials Design Features of the EST Materials – Appendix K 94
3.5.4. Corpus Software Tool 94
3.5.5. Summary of Instruments Used in This Study 94
3.6 Data Collection Procedures 97
3.6.1. Analysis of Text Type, Language Knowledge, and Key Visuals from the Application of the Adapted DARTS Model - Appendix Q 97
3.6.2. Responses Obtained from Learning Object Review Instrument (LORI) – Appendix D 98
3.6.3. Data Obtained from Questionnaire (Appendix K) 100

| | | | |
|---|---|---|---|
| 3.7 | Pilot Study | | 100 |
| | 3.7.1. | Results of the Pilot Study | 103 |
| | 3.7.2. | Pre-Evaluation Stage of the Pilot Test for Test Subjects | 103 |
| | 3.7.3. | Post-Evaluation Stage of the Pilot Test for the Test Subjects | 105 |
| | 3.7.4. | Science Instructor Responses at the Pre-Evaluation Pilot Test | 106 |
| | 3.7.5. | Science Instructor Responses at the Post-Evaluation Pilot Test | 107 |
| | 3.7.6. | Language Instructor Responses at the Pre-Evaluation Pilot Test | 107 |
| | 3.7.7. | Language Instructor Responses at the Post-Evaluation Pilot Test | 108 |
| | 3.7.8. | Summary of the Inter-Rater Reliability Test of the Pilot Testing Stage | 109 |
| | 3.7.9. | Sequenced EST Materials | 109 |
| 3.8 | Conclusions | | 110 |
| 4 | **RESULTS AND DISCUSSION** | | |
| 4.1 | Introduction | | 111 |
| 4.2 | Part 1 - Research Question 1 | | 111 |
| | 4.2.1 | Analysis and Discussion of Findings | 111 |
| | 4.2.2 | Summary | 116 |
| 4.3 | Research Question 2 | | 116 |
| | 4.3.1 | Analysis and Discussion of Findings | 117 |
| | 4.3.2 | Summary | 119 |
| 4.4 | Research Question 3 | | 121 |
| | 4.4.1 | Analysis and Discussion of Findings | 121 |
| | 4.4.2 | Summary | 124 |
| 4.5 | Research Question 4 | | 124 |
| | 4.5.1 | Analysis and Discussion of Findings | 124 |
| | 4.5.2 | Summary | 127 |

| | | | |
|---|---|---|---|
| | 4.6 | Differences between Feedback from Group 1 and 2 | 128 |
| | | 4.6.1 Reliability of LORI (Appendix D) – Group 1 and 2 | 133 |
| | | 4.6.2 Summary | 135 |
| | 4.7 | Research Question 5 | 136 |
| | | 4.7.1 Analysis and Discussion of Findings | 136 |
| | | 4.7.2 Summary | 139 |
| | 4.8 | Summary of Findings | 140 |
| | 4.9 | Conclusion | 141 |
| 5 | **CONCLUSION** | | |
| | 5.1 | Introduction | 142 |
| | 5.2 | Summary of Study | 142 |
| | 5.3 | Summary of the Overall Findings | 144 |
| | 5.4 | Implications of the Study | 145 |
| | 5.5 | Recommendations | 147 |
| | 5.6 | Suggestions for Future Research | 151 |
| | 5.7 | Concluding Remarks | 152 |
| **REFERENCES** | | | 154 |
| **APPENDICES** | | | 167 |
| **BIODATA OF STUDENT** | | | 326 |

## LIST OF TABLES


| Table | | Page |
|---|---|---|
| 2.1 | Categories of English for Specific Purposes (ESP) | 36 |
| 2.2 | DARTS Model adapted and modified from: Lunzer & Gardner, 1984; Davies and Greene, 1984; Rafik-Khan, 1997 | 51 |
| 2.3 | Scientific genres by Martin (1990) | 52 |
| 2.4 | Definition of Terms in Usability | 62 |
| 3.1 | Test Subjects Grouping | 87 |
| 3.2 | Discourse Knowledge Framework for Sequenced EST Materials | 90 |
| 3.3 | Discourse Knowledge Framework for Unsequenced EST Materials | 90 |
| 3.4 | Rating Scale | 91 |
| 3.5 | A Questionnaire Survey Research Design for Each Group Using LORI – Quantitative Data | 95 |
| 3.6 | Instruments Used in the study | 95 |
| 3.7 | A Questionnaire Survey Research Design for Group 1 And 2 Using LORI – Quantitative Data | 99 |
| 3.8 | Lessons in the Pre-Evaluation of the Pilot Study | 101 |
| 3.9 | Interpretation of Coefficient (r) | 103 |
| 3.10 | Summary of Shortcomings from the Pre-Evaluation Stage of the Pilot Test | 104 |
| 3.11 | A Summary of Science Instructor Responses at the Pre-Evaluation Stage of the Pilot Test | 106 |
| 3.12 | Correlation of the LORI Tests' Scores Between the Two Raters at the Pre-Evaluation Pilot Test | 108 |

| | | |
|---|---|---|
| 3.13 | Correlation of the LORI Tests' Scores Between the Two Raters at the Post-Evaluation Pilot Test | 108 |
| 4.1 | Pre-Evaluation and Post-Evaluation Data Under LORI's Learning Value Subscale For Group 1 and 2 | 111 |
| 4.2 | Pre-Evaluation and Post-Evaluation Data Under LORI's Value Added by EST Materials Subscale for Group 1 and 2 | 118 |
| 4.3 | Pre-Evaluation and Post-Evaluation Data Under LORI's Usability of the Interface Subscale For Group 1 And 2 | 122 |
| 4.4 | Pre-Evaluation and Post-Evaluation Data Under LORI's Impact of Visuals Interface Subscale for Group 1 and 2 | 126 |
| 4.5 | Sequenced EST Materials' Average Scores for Group 1 and 2 in the 4 Subscales | 128 |
| 4.6 | Unsequenced EST Materials' Average Scores for Group 1 and 2 in the 4 Subscales | 131 |
| 4.7 | SPSS Results for Wilcoxon Signed Ranks Test for Group 1 | 133 |
| 4.8 | SPSS Results for Wilcoxon Signed Ranks Test for Group 2 | 134 |
| 4.9 | Responses to Questions 1 to 3 on Materials Design for Group 1 | 137 |
| 4.10 | Responses to questions 1 to 3 on Materials Design for Group 2 | 138 |
| 5.1 | EST Materials Framework Checklist | 149 |

## LIST OF FIGURES


| Figure | | Page |
|---|---|---|
| 2.1 | LODAS Theory | 22 |
| 2.2 | A Diagrammatic Representation of Sequenced and Unsequenced Content | 28 |
| 2.3 | The Position of EST Materials in the Link from LODAS Theory to Conceptual Framework | 29 |
| 2.4 | Principles of Adapting ESP Materials by McDonough and Shaw (1983) | 34 |
| 2.5 | Characteristics of EST Materials | 37 |
| 2.6 | Learning Content Management System | 59 |
| 2.7 | A Diagrammatic Representation of Human Computer Interaction | 61 |
| 2.8 | A Diagrammatic Representation of Usability Testing | 62 |
| 2.9 | A Diagrammatic Representation Regarding the Summary of the Considerations for Using Online EST Materials | 65 |
| 2.10 | Hierarchy of Goals | 67 |
| 2.11 | Conceptual Framework | 70 |
| 5.1 | Sugggested Flow Chart of the Online EST Materials Framework | 149 |

## LIST OF ABBREVIATIONS

| | |
|---|---|
| DARTs | Directed Activities Related to Text |
| ESP | English for Specific Purposes |
| EST | English for Science and Technology |
| LCMS | Learning Content Management System |
| LODAS | Learning Object Design and Sequencing |
| LORI | Learning Object Review Instrument |
| RLO | Reusable Learning Object |
| SCORM | Sharable content object reference model |
| SECE | Sequencing Essentials Content Example |
| SEDL | Southwest Educational Development Laboratory |
| UCeL | Universities' Collaboration in Elearning |

# CHAPTER 1

# Introduction

## 1.1 Introduction

Computers are indispensable in the modern world as the powerful mode for communication and education. The availability of the Internet has reinforced learners' interest to learning languages by providing easy access to a wide array of information and serves as an efficient tool to facilitate learning.

The concept of Information and Communication Technology (ICT) which has traditionally been associated with the use of the personal computer is now inextricably linked to the Internet. The Internet represents a dependable and constantly updated resource for both general and specific interest materials that are invaluable to learners. This implies the interactive application of the World Wide Web for web-based learning.

The increasing importance and endorsement of self-directed learning of the English language and the expanding role of online technologies have become the major features in language teaching in institutions worldwide. Interestingly, these two aspects have the potential to be realized in a complementary way. At the tertiary level, an example is the English as a Second Language (ESL) teacher education program offered by Open University Malaysia (OUM) which is the first open and distance learning university in Malaysia (Kuldip Kaur & Harvinder Kaur, 2006). The shifts in the role of English in Malaysian public

schools are even more dramatic. English has shifted from the medium of instruction to its present day status as a second language for the learners and teachers alike. A consequence of this transformation is that teachers of English language and literature have become teachers of Mathematics and Science “primarily because they are considered to be proficient users of the language” (p. 251). These shifts have been accompanied by substantial increases in allocation for Information, Computer and Technology (ICT) resources in ESL teacher education (Kuldip Kaur & Harvinder Kaur).

## 1.2 Background Information

English for Specific Purpose (ESP) programs are built on an assessment of purposes, needs and the functions for which English is required. ESP focuses more on language in context than on teaching grammar and language structures. It covers a range of subjects from accounting or tourism to Science and Technology. The central point of ESP is that English is integrated into a subject matter area important to the learners. ESP combines subject matter and English language teaching. Hutchinson and Waters elegantly describe ESP as "an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning" (1987, p. 19).

In ESP, it is a needs analysis that determines which language skills are most needed by the students, and the syllabus is designed accordingly. An ESP program, might, for example, emphasize the development of reading and writing

skills in students who are learning Science and Technology in Form 5 or it might promote the development of spoken skills in students who are studying English in order to become tourist guides. Being able to use the vocabulary and structures that they learn in a meaningful context reinforces what is taught and increases their motivation.

The requirement for a needs analysis meant that materials may have to be adapted to the target audience for a course such as online English for Science and Technology (EST). McDonough and Shaw (1993) outlined several basic principles of adapting materials. Firstly, the authors advocate personalizing the content when the particular learning styles of individual students and teacher has to be addressed. Web based tasks allow each student or a group of students to work on different computers, on various materials, and perhaps asked to perform different tasks. These students are able to progress at their own speed using their preferred learning methods. Secondly, the authors suggest individualizing the content when students choose materials which are of interest to them. Thus, online instruction boosts motivation and grants students responsibility for learning. Thirdly, the authors support localizing the content when administration of specific sites allows for adaptation of materials owing to geographical or cultural differences. However, there appears to be inadequate research into the features of EST materials which bring out text structure, language knowledge, and key visuals elements, particularly in the context of web-based learning.

As noted earlier, the Internet is the conduit for information exchange. A lesson on English for Science and Technology, a subset of English for Specific Purposes, which is available online, would be assessable worldwide. Therefore, such materials can be simply reused by educators and organizations alike provided there is a practical method to locate the relevant learning materials and string them into a readable and presentable format. Thus, the term learning object has been proposed. In essence, the materials for English for Science and Technology could consist of small pieces of learning components known as learning objects which can be reused in various combinations and at the same time, be compatible with the different web based learning platforms used by corporations, training vendors and educational institutions (Wiley, 2000). Wiley comments that the various instructional design theories available do not provide taxonomies for the scope and sequence of learning objects. The evaluation of learning objects and comparison of web learning platforms are beyond the scope of this study.

It is important to identify the linguistic elements of the scientific genre in order to gain an understanding of the English for Science and Technology materials in context. The relationship between genre and the sequence of language events is strengthened by the inclusion of vocabulary and grammatical structures (Paltridge, 2001). Furthermore, an extended analysis of the genre arising from sequenced language activities would determine if the learning objectives are met (Bradford-Watts, 2003).

The proliferation of documents on the Internet has spawned new ways of searching, retrieving, and conveying electronic documents. Under such circumstances, research on the characteristics and uses of genres need to be enhanced by information of the genre itself and of its many variations.

This study attempts to carry out an evaluation of sequenced and unsequenced web-based EST materials on a Learning Content Management System (LCMS), after mapping out the text types, language knowledge, and key visuals elements required. The study focuses on the issues relating to the EST materials sequenced by applying the Learning Object Design and Sequencing (LODAS) Theory as well as the usability of the online interface and the impact of visuals.

### 1.3 Problem Statement

It is hoped that the findings of the study would fill the gap in the literature as there has not been a comprehensive study in the local context that addresses this particular issue up to this point. Logan (1995) argues that computing represents a new form of language. Extending this line of thinking further, it is worth noting Halliday's (1996) contribution to applied computing with his view on the vital link between language and learning, which consists of learning language, learning about language, and learning through language.

Osman, Halim, and Meerah (2006) found that the most prevalent needs of the Malaysian secondary school Science teachers are the integration of multimedia and the use of English in Science instruction. Yet, very little research, if any, is done about the infusion of technology into EST learning.

There are a lot of research papers on EST Materials in the classroom. The linguistic features of EST materials have been dealt with by a number of writers (Orr, 1996; Viel, 2002a, 2002b; de Oliveira, 2003; Freiermuth, 2003; Kavaliauskiene, 2004). These studies dealt with specific items of vocabulary, grammar, simulation, writing, and corpus linguistics. There is however a lack of research which covers a broader scale of language features found in EST materials.

The issues underlying EST is succinctly summarized by Rafik-Galea (2005) who pointed out that “Within the context of EST, there appears to be a lack of research and attention to how teachers interpret, design, develop and use materials in EST” (p. 91). Rafik-Galea further emphasized that “These materials have different genres, registers, and specialized vocabulary when compared to English for General Purpose (EGP) materials” (p. 91). Thus, content-based materials in EST present a challenge for EGP teachers who are required to teach EST. These EGP teachers usually have limited or no training in EST materials design. It is important for EST teachers to understand the features of EST materials so that “they can guide their students to comprehend Science and Technology materials in English” (p. 91). These have implications not only for