UNIVERSITI PUTRA MALAYSIA

ADJUNCT LANGUAGE INSTRUCTION FOR ENGLISH AS A SECOND LANGUAGE ENGINEERING STUDENTS IN WRITING OF PHYSICS LABORATORY REPORTS

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

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DEDICATION

This thesis is dedicated to Omar Mahari and Dora.

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

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By

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September 2005

Chairman: Professor Chan Swee Heng, PhD

Faculty: Modern Languages and Communication

This study investigated the extent to which adjunct language instruction (ALI) was effective and identified the factors that influenced the effectiveness.

In exploring the effectiveness, this study attempted a study on engineering students in UiTM using customized lab report writing instructional materials. A needs analysis was conducted and it showed that engineering students preferred learning report writing to personal essay writing. The students' preference for learning report writing set the stage for further exploration. Sixty students were instructed lab report writing in content-based writing

using genre-based materials based on the students' actual Physics lab experiments, called Physics Adjunct Language Instruction (PALI). The results showed that the students' grades of lab report writing improved. Another test was carried out to find whether teaching writing in an ALI approach was able to meet the writing needs of engineering students. This test used Structural Equation Modeling (SEM) as an analytical tool. As SEM requires a sample size of 200 to 300 respondents, another instruction using similar materials, PALI, was carried out on 260 engineering students. The structural model showed that there were two factors that influence the improvement of the students' lab report writing in PALI. The factors were the teaching conduct and the preference for materials.

In summary, the research revealed three main findings. First, the type of writing needed by engineering students in UiTM was report writing. Second, the PALI led to an improvement in the engineering students' lab report writing ($t = -8.01$, $p = .000$). Third, PALI provided two factors or conditions necessary for its success: the way the lab report writing was taught ($\beta = 0.451$) and the preference of materials which are related to the learners' content subject ($\beta = 0.419$). These two necessary conditions contribute 69.9 % (R^2 .699) to meeting the success in lab report writing of these engineering students

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

ADJUNCT LANGUAGE INSTRUCTION UNTUK PELAJAR KEJURUTERAAN DALAM PENULISAN LAPURAN MAKMAL FIZIK

oleh

MEGAWATI OMAR

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Pengerusi: Profesor Chan Swee Heng, PhD

Fakulti: Bahasa Moden dan Komunikasi

Kajian ini bertujuan untuk melihat sejauh mana keberkesanan 'Adjunct Language Instruction' (ALI) dan faktor-faktor yang membawa kepada keberkesanan tersebut dengan menggunakan bahan mengajar penulisan.

Bagi menjelaskan keberkesanan ALI, eksperimen telah dijalankan terhadap pelajar-pelajar semester dua, program kejuruteraan di Universiti Teknologi MARA, Malaysia.

Pertama, analisis keperluan yang dijalankan menunjukan para pelajar program kejuruteraan ini lebih berminat untuk mempelajari penulisan lapuran berbanding penulisan esei. Kedua, kajian dilakukan terhadap keberkesanan dalam pengajaran penulisan lapuran makmal. Kajian ini dilihat dengan cara mengajar 60 orang pelajar kejuruteraan penulisan berdasarkan 'content-based'. Pengajaran ini menggunakan bahan penulisan berasas genre saperti yang digunakan oleh pelajar-pelajar dimakmal fizik. Bahan mengajar ini dinamakan PALI (Physics Adjunct Language Instruction).

Keputusan menunjukan tahap pencapaian para pelajar dalam penulisan laporan makmal meningkat. Seterusnya, kajian dibuat untuk mengenal pasti faktor-faktor kepada keberkesanan tersebut. Dalam fasa ini kaedah 'Structural Equation Modeling' (SEM) digunakan sebagai alat analitikal. Memandangkan SEM memerlukan 200 – 300 sampel, maka 260 orang pelajar kejuruteraan telah diajar dalam fasa ini dengan menggunakan bahan-bahan yang sama iaitu PALI.

Kajian ini telah menemui tiga dapatan. Pertama, jenis penulisan yang diperlukan oleh para pelajar program kejuruteraan ialah penulisan laporan. Kedua, penulisan laporan dengan menggunakan kaedah PALI, telah

meningkatkan tahap pencapaian penulisan laporan makmal oleh para pelajar program kejuruteraan (t = -8.01; p = 000). Ketiga, PALI yang digunakan dalam kajian ini menyumbangkan dua faktor atau syarat yang diperlukan untuk keberkesananya. Faktor-faktor tersebut ialah 1) cara yang digunakan untuk mengajar penulisan laporan (β=0.451), 2) para pelajar lebih suka belajar menggunakan bahan-bahan Bahasa Inggeris yang berkaitan dengan mata pelajaran penting mereka (β=0.419). Kedua-dua syarat ini telah menyumbang sebanyak 69.99% (R^2 .699) untuk memenuhi keperluan penulisan laporan oleh para pelajar program kejuruteraan itu.

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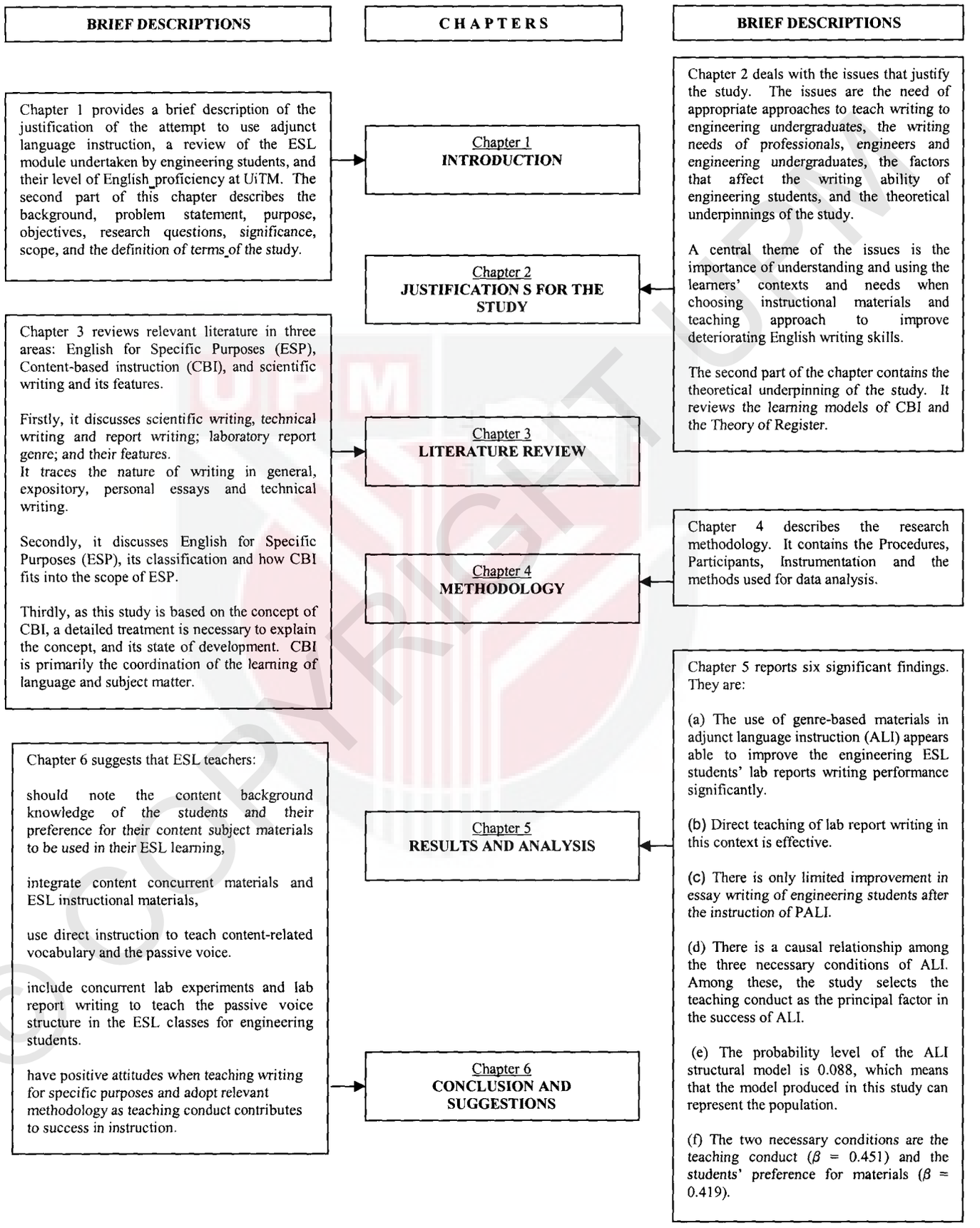
LIST OF ABBREVIATIONS

ALI	Adjunct Language Instruction
CBI	Content Based Instruction
ESL	English as a Second Language
ESP	English for Specific Purposes
LR	Lab Report
SEM	Structural Equation Modelling
UiTM	University Teknologi MARA, Malaysia
PALI	Physics Adjunct Language Instruction

The Organization of the Thesis



CHAPTER 1

INTRODUCTION

This chapter describes the background, justification, problem statement, purpose, objectives, research questions, significance, scope, and definition of terms of the study.

1.1 Background of the Study

The poor writing performance of engineering students at UiTM has remained a major cause for concern. The non-content writing instruction elicits general complaints from most ESL teachers teaching writing in the Faculty of Engineering, of whom the present writer is one of them, that the writing performance is generally unsatisfactory. In fact, this study began with the observation of three problems during the writer's ten years of teaching non-content based writing to engineering students of the university. The first was the students' continuous production of unsatisfactory short essays. The second was the students' anxiety about the language of the reports that they wrote in English to meet the requirement of their content subjects. The third was the persistent errors generated when they used the passive voice in the writing. Some information was also gathered to throw light on the language proficiency of engineering students in UiTM. Engineering students of UiTM who studied in December 1999-April 2000 reported that they faced a lot of difficulties when they had to write their final year projects because of poor

writing skills (Language Centre, UiTM). They claimed that this particular inability severely affected their overall academic results. In addition, comments gathered from the English language teachers at the Language Centre, UiTM, pointed mainly towards the students' inability to speak and write. They commented that students severely lacked vocabulary knowledge that is expected from university students and this may be attributed to a lack of reading habit, exposure to English language, and inappropriate teaching methods. To overcome these problems, the students continuously sought help from their English language teachers to edit their reports before submitting them to their science and engineering content instructors.

The problems in classrooms and the information from the ESL instructors in UiTM signaled an important direction in which ESL teaching should take. It led to the present writer's inference that the students' continuous production of unsatisfactory essays and reports might be related to, though not directly caused by, the inappropriate instructional approaches and irrelevant instructional materials. In particular, the writer assumed that inappropriate instructional approaches and irrelevant materials led to the students' dislike of writing, which in turn led to the students' unsatisfactory writing. Mohan (1986) claims that an educational approach that separates language learning and subject matter is inadequate to fulfill the needs of learners. For example, the present writer had seen in classrooms that the learners concerned in this study failed to write clearly to express their knowledge in written academic projects. This could be due to language learning being separated from the content areas. It was also believed that the materials