UNIVERSITI PUTRA MALAYSIA

AN INVESTIGATION INTO PERFORMANCE IN ENGLISH AND CRITICAL THINKING BETWEEN TWO ENGLISH COURSES

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By

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

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DEDICATION

I dedicate this to all critical thinkers and those who dare to act on them.

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

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Chairman: Ghazali Mustaffa, Ph.D

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The purpose of this research is to investigate how General English proficiency (GEP) and critical thinking affects the study of English in two different learning situations; one coded MI005 (S) and the other coded WB012. The observation involves first year UPM bumiputra matriculation science students and first year Kolej Teras Timur (KTT) bumiputra matriculation science students. The Sijil Pelajaran Malaysia English is used as the measurement for GEP while critical thinking is measured by the performance of these two groups answering higher order questions (HOQ) and lower order questions (LOQ.

The UPM subjects undergo an ESP (Science) with critical thinking skills course coded MI0015 (S) while the KTT subjects under a general English course coded WB012.

Both English courses lasted 14 weeks. The MI 005 (S) course is designed by the researcher under the supervision of the English Unit of the UPM Matriculation Centre. Syllabus and tests pertaining to WB012 are designed by the Education Ministry. The subjects who went thorough the programme are bumiputra first semester matriculation science students who will be qualified for local university entry upon finishing their matriculation programme in fulfilment to the requirements of the respective universities.

At the end of both programmes, Higher Order Question (HOQ) test and Lower Order Question (LOQ) test are administered. The effects of critical thinking are observed and investigated by looking at the performance of both groups of subjects in these two tests.

The Spearman-rho correlation formula and Pearson-r Correlation Coefficient formula are run to observe the relationship between GEP with the performance of the English programmes (MI 005 (S) and WB012) as well as the relationship between GEP with HOQ and LOQ. The Pearson product moment coefficient (r) is used to observe the relationship between the performance of both the English programmes with HOQ and LOQ.

Independent T-tests are then run on both groups on all collected data covering GEP, HOQ, LOQ, performance in MI 005 (s) and performance in WB012. This is to observe, investigate and describe the significance of the their difference in mean scores.

Based on the statistical analysis it is observed that General English Proficiency positively correlates with both the performance in an ESP (Science) with critical thinking programme, r=.886 as well as a general English programme r=667. However,

results of the data analysis indicated that the ESP (Science) subjects require better general English proficiency (GEP) if they want to perform better in their English course (MI 005 (S)) when compared to their peers who are doing a general English course (WM 012). The research also suggests that there is a possibility that critical thinking can be taught in an ESP (Science) programme.

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

PENYASIATAN TERHADAP PENCAPAIAN BAHASA INGGERIS DAN PEMIKIRAN KRITIS DI ANTARA DUA KURSUS BAHASA INGGERIS

Oleh

DANIEL HASNI BIN MUSTAFFA

Januari 2002

Pengerusi: **Ghazali Mustapha,Ph.D**

Fakulti: **Pengajian Pendidikan**

Tujuan utama kajian ini adalah untuk melihat dan mengkaji bagaimana kemahiran berbahasa Inggeris Am seperti yang diukur oleh Kertas Bahasa Inggeris SPM and juga bagaimana pemikiran kritis boleh membantu di dalam situasi Bahasa Inggeris bagi tujuan spesifik. Ini dilakukan dengan menyiasat dan mengkaji bagaimana kemahiran berbahasa Inggeris memberi kesan terhadap tahap pencapaian pelajar matrikulasi sains di dalam dua situasi pembelajaran yang berlainan; satu yang menggunakan Bahasa Inggeris Am dan satu lagi yang menggunakan Bahasa Inggeris Spesifik dengan unsur pemikiran kritis.

Keduanya ialah dengan mengkaji dan menyiasat bagaimana pemikiran kritis mempengaruhi kebolehan menjawab soalan berasaskan sains tahap tinggi (HOQ) dan saolan berasaskan sains tahap rendah (LOQ).

Dua kumpulan pelajar berlainan diambil sebagai subjek ; satu dari Universiti Putra Malaysia dan satu lagi dari Kolej Teras Timur. Mereka terdiri dari pelajar kolej matrikulasi yang akan memasuki universiti tempatan setelah tamat tempoh pengajian dan setelah memenuhi syarat-syarat yang ditetapkan senat univesiti masing-masing Gred kertas Bahasa Inggeris SPM diambil sebagai kriteria penetuan tahap pencapaian Bahasa Inggeris Am mereka. Subjek dari UPM menduduki kursus Bahasa Inggeris spesifik dengan pemikiran kritis meggunakan kod MI005 (S) dan subjek dari KTT menduduki kursus Bahasa Inggeris Am menggunakan kod WB012. Kedua-dua kursus mengambil masa 14 minggu untuk tamat. Subjek kemudiannya dibahagikan kepada dua iaitu kumpulan pencapaian Bahasa Inggeris tinggi (HEA) dan kumpulan pencapaian Bahasa Inggeris rendah (LEA). Mereka kemudiannya perlu menjawab soalan berasaskan sains tahap tinggi (HOQ) dan soalan berasaskan sains tahap rendah (LOQ).

Ujian korelasi Spearman-rho dan Pearson-r dijalankan ke atas pembolehubah-pembolehubah yang terlibat untuk menentukan korelasi dan ujian t pula dijalankan untuk mengetahui kesignifikan skor min pembolehubah. Berdasarkan analisis statistik yang dibuat didapati bahawa pencapaian Bahasa Inggeris Am mempengaruhi prestasi pencacapaian kedua-dua situasi pembelajaran Bahasa Inggeris yang berlainan; Bahasa Inggerris Spesifik; MI 005 (S) dengan unsur pemikiran kritis dan Bahasa Inggeris Am MI 005 (S); WB012. Walau bagaimanapun, subjek dari MI005 (S) menunjukkan bahawa mereka memerlukan pencapaian kemahiran berbahasa Inggeris yang lebih tinggi untuk mendapat prestasi yang lebih baik jika dibandingkan dengan rakan mereka yang

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First of all I would like to say " Alhamdulillah hirrobil a'lamiin" i.e. "all praise be to Allah the Sovereign Lord of the Universe" for giving me guidance to finish this long due thesis. I would like to convey my gratitude to Dr. Ghazali Mustapha for the time, patience, and understanding and also for the new insight on critical thinking.

My appreciation to Dr. Rohani for her comments on statistics. Mr. Jayakaran my sincere thank you for the intellectual discussions. To Dr. Bahaman "Jazakumullah Khair" for all the help whose kindness is deeply appreciated.

To my wife and family I am amazed at your naivety that a Masters thesis is the "valid excuse" that I can get to stay out late and be away from home which I did not put to "waste".

Finally to anyone out there who had somehow by chance or design had contributed in someway or another to the thesis I would like to say thank you. Finally, any shortcomings are but my own.

May the blessings of Allah be on all of you and let there be love.

Thank you.

This thesis submitted to the Senate of Universiti Putra Malaysia has been accepted as fulfilment of the requirement for the degree of Master of Science .

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ABBREVIATIONS

SPM	Sijil Pelajaran Malaysia
GEP	General English Proficiency (based on 1119 SPM English)
UPM	Universiti Putra Malaysia
KTT	Kolej Teras Timur, Kuala Dungun. Ternggnu
ESP	English For Specific Purposes
MI 005 (S)	English for Specific Purposes I (Science) with Critical Thinking (A 14 week ESP in science with Critical Thinking Skills rogramme designed as part of a course for UPM matriculation science students).
WB012	A 14 week general English programme designed by the Ministry of Education for their first semester matriculation science programme.
HOQ	Higher Order Questions (a science based test using higher order questions)
LOQ	Lower Order Questions (a science based test using lower order questions)
HEA	High English Achievers (SPM English grade 1,2 and 3)
LEA	Low English Achievers (SPM English grade 6,7 and 9)

CHAPTER I

INTRODUCTION

The purpose of this research is to investigate and observe how General English proficiency (GEP) and critical thinking affect the study of English in two different learning situations, one using English for Specific Purposes (Science) ESP with critical thinking skills coded MI005 (S) and the other a general English programme coded WB012. The observation involves first year UPM bumiputra matriculation science students. The Sijil Pelajaran Malaysia English is used as the measurement for GEP while critical thinking is measured by the performance of these two groups answering the higher order questions (HOQ) and lower order questions (LOQ).

MI0015 (S) is a 14-week ESP (Science) with critical thinking skills inculcated into it. Evaluation for MI 005 (S) covers oral presentation (10%) grammar and writing handouts (5%), writing task (5%), Test One (20%) Test Two (20%) and a Final Exam (40%) refer (Appendix A). On the other hand, WB012 is a General English proficiency programme. Apart from the normal reading, writing and speaking components, elements of critical literature appreciation are also included. At the end of the course three tests are designed and administered. Evaluation for WB012 covers a 10% test on listening, 10% on communication skills with the remaining 80% on a final examination (Appendix B). The duration of the course is 14 weeks which is the same as the MI 005 (S) programme.

At the end of both programmes Higher Order Question test and Lower Order Question test are administered. The effects of critical thinking are observed and investigated by looking at the performance of both groups in these two tests.

Correlation analyses are run to observe the relationships and determine the strength and direction (nature) between all observed variables. For this purpose the Spearman-rho is used to observe the relationship between GEP and the performance of the English programmes as well as the relationship between GEP with HOQ and LOQ. The Pearson's product moment coefficient (r) is used to observe the relationship between the performance of both the English programmes with HOQ and LOQ.

Independent t-tests are then run on both groups on all collected data covering GEP,HOQ, LOQ, MI 005 (S) and WB012. This is to observe and investigate the significance of the their difference in mean scores to further describe the relationship between all the observed data.

Ewer and Lattore (1974) and Glendinning (1974) believe that once basic English language is mastered, it would help learners to acquire knowledge more easily. They contend that this is so because basic language is common to all scientific disciplines and it forms the essential framework of language use. In a paper presented by Steinhausen (1993) based on teaching experience in a Malay-medium Brunei secondary school where the students were taught ESL, it is

recommended that ESP should be taught after students have mastered a core of general English skills.

One aspect of the Dimensions of Scientific Literacy (1993) is that "science is based on evidence, developed privately by individuals or groups, that is shared publicly with others". Based on this aspect, one important skill that we would like to see present in science based students would be the ability to identify these "evidence" which is "shared publicly"; most commonly a book. It is through the medium of print that the manifestation of knowledge is most commonly shared in a student's quest for information.

Literature in critical thinking seem to support that procedural learning developed in specific content is actually beneficial in the learning process (Meyers, 1986; Gagne, Yekovich and Yekovich1993). Meyers, (1986) citing McPeck (1981) says that:

> *"Thinking is always about X, and that X can never be 'everything in general' but always something in particular" so as to help "students master the thinking and reasoning skills that they will need to process and use the wealth of information already at hand".*
> *(Meyers,1986:6)*

Gagne, Yekovich and Yekovich (1993) seems to support this when they say that "...when a person gains procedural knowledge, they acquire "cognitive" which helps them to use knowledge to think, solve problems and make decisions". However, he warns of the many variables that can affect the domain that is being developed causing critical thinking skills to be less successful. However, having fewer variables, like making the subject matter more specific in nature and the

students more homogenous, the critical thinking programme would be more successful.

Beyer (1988) on the other hand suggests that thinking skills taught can be transferred into other aspects of living skills including other areas of academic learning. He said that:-

"... a programme designed to teaching thinking skills benefits faculty and students immensely in that their out-of school lives as well as their school work". (Beyer, 1988:1)

If this is true, then teaching critical thinking skills in a specific area of study would have a tremendous benefit to students in relation to their ability to transform new acquired academic and thinking skills in other areas of their study.

Afiza (2000) mentioned that Beyer (1985) discloses that the use of open ended or investigative questions can help encourage critical thinking. Rhodes (1980) claims that the level of critical thinking can be increased as well as can be used in their reflective thought if the questions are asked properly. Chaudari (1974) says that questions that go beyond what has been learned can incite a connection between learning and thinking. Thus, a teacher can raise students' critical thinking level by improving on the students' thinking capabilities by questions that are challenging.

Questioning and thinking in the Islamic perspective is regarded as an activity that could bring someone closer to The Creator Himself. In fact Man is constantly instructed by Allah S.W.T. to investigate and ponder over Sunnatullah

or the Laws of Allah (Laws of Nature or science) in the quest of knowledge so that he may seek and find and ultimately understand God and be at peace with himself. As cited in the Quran Chapter 39, verse 9;

"... Say: Are those who know and those who do not know? It is those that are endured with understanding that receive admonition."

Questions posed in the classroom can be classified in a number of ways and the most popular one is the Bloom's Taxonomy (Morgan and Saxton 1991). This taxonomy of questions involves six levels of thinking. They are knowledge, comprehension application, analysis, synthesis and evaluation. Blooms's Taxonomy of questions are divided into two; higher order and lower order according to how questions are asked. Lower order questions literally requires extraction of information while higher order questions require some kind of challenge to the mental capabilities involving the application, analysis, synthesis or evaluation of thoughts (Ghazali, 1998). The understanding of formulating questions using Bloom's taxonomy can help a teacher formulate questions that help determine the degree of accuracy in the kinds of intellectual activity that is required. The use of high cognitive thinking skills can actually promote critical thinking skills (Fowler,1997). If this is successfully inculcated in the a syllabus, students somehow will be deliberately forced to use their mental faculty to apply, analyse, synthesise, and /or evaluate their knowledge as they respond to higher order questions.

However, Al-Ghazali quotes that one must observe certain *adap* or ethics when asking questions (Abul Quasem,1975).

Apart from being able to identify the lower order skills (Anderson and Sosniak, 1994) the ability to engage in higher order thinking activities are more expected in a scientifically literate person. These two domains of thinking; lower order and higher order forms the basis of Bloom's Taxonomy and at the same time is expected of a scientifically literate person. Therefore, the research also looks at the influence of these two domains in relation to the ESP (Science) with Critical Thinking Skills.

Facione (1997) in explaining the "self-regulation" concept in thinking states that a person with good critical thinking skills uses all six core cognitive thinking skills interactively and recursively. Mayers (1986) and Gagne, Yekovich and Yekovich (1993) suggest that critical thinking supports learning especially in specific content areas. Meyers (1986) citing McPeck (1981) says that "thinking is always about X, and that X can never be "everything in general" but always "something in particular" so as to help" students master the thinking and reasoning skills that they will need to process the use of knowledge already at hand". This means that thinking so as in procedural thinking actually helps in making a person better adaptable to his environment. Beyer (1988:1) supports this when he says that a programme designed to develop thinking skills helps students in schools as out of schools.

Statement of the Problem

Malaysian students start to learn English as a Second Language as early as seven years old when they begin their primary education right up until they finish their secondary education. This means that they undergo at least eleven years of General English before enrolling into matriculation programmes. Among the preparation of the English programmes at secondary school level is to give them enough proficiency for various "post-secondary school needs" (English Curriculum Specification,1991). The 1119 SPM English grades would expectedly correspond with their General English Proficiency (GEP). However, it is still not known whether it would help them do an English for Specific Purposes ESP (Science) with critical thinking skills.

As Malaysia gears itself towards Vision 2020 (to achieve a developed nation status by the year 2020) with its nine challenges and the National Education Policy indirectly we see a new perspective in the effort to develop a person's potential to the optimum through the process of using education as a means of promoting "Universal Integrated World View" (Nik Azis, 1996). This in turn would mean that the education programme in Malaysia would require change.

Among the most radical and ambitious change the country has seen is to establish the "smart school programme". The concept of smart schools would require independent learners with very critical minds who would be able to understand and appreciate the true meaning of humanity, knowledge, education