

**The Impact of Changing the Language Medium for  
Mathematics Subject on Rural Secondary School Students.  
A Case Study in Kelantan**



**Institute of Research, Development and Commercialization  
MARA University of Technology  
40450 Shah Alam  
Selangor, Malaysia**

**Prepared by:**

**Neo Kian Sen**

**Profesor Madya Moniza BT Abdullah**

**Profesor Madya Dr. Jusoh Bin Yacob**

**Academy of Language Studies  
MARA University of Technology (UiTM)  
Kelantan Branch  
Machang Campus  
May 2006**

## Acknowledgements

We extend special thanks to all the head masters, teachers and students from our sample schools who have given us full support to make this research a success.

## Table of contents

Chapter	Page number
<b>1 Introduction</b>	
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Objectives of Study	3
1.4 Research Questions	4
1.5 Test of Hypotheses of This Study	5
1.6 Significance of Study	6
1.7 Limitations of Study	7
1.8 Definition of Terms	8
1.9 Reflections Prior to the Study	9
<b>2 Review of Literature</b>	
2.1 The Important and Effective Ways of Learning Foreign Language	10
2.1.1 The Importance of learning foreign language	11
2.1.2 The Effective ways of learning foreign language	12
2.2 Language across Curriculum	13
2.3 Learning Mathematics in the second language	14
2.4 The Relationship between Language and Learning	15
2.5 Mathematics is a Language and as a Language	16
2.6 Linguistic influences on learning mathematics	13
<b>3 Methodology</b>	
3.1 The Research Instrument	22
3.2 The Participating Schools	23
3.3 The Cluster Sampling Procedure	24
3.4 The Data Analysis Technique	25
<b>4 Analysis of Data and Result</b>	
4.1 The Ratio of Gender for the Sample	26
4.2 The Breakdown of the Academic Background for Three major Subjects Performed by the Sample	27
4.3 The Students' Perspective and Experience of learning mathematics in English and in Their Mother Tongue	28
4.3.1 Feelings of the Students along the Stages of Implementation of the Program of Changing the Language Medium in Mathematics	11
4.3.2 Readiness of students in using English in School and at Home	12

## Abstract

This research studies the impact of the changing of language medium on secondary school mathematics learning among the Malay rural students in Kelantan. We focus on the analysis of mathematics performance attained by two groups of pupils. The first group of students was invited to attend a researcher-made Standard Mathematics Achievement Test (SMAT) prepared in English and the second group of students was invited to sit for the same test which was translated in Bahasa Malaysia. The test has contained 30 multiple-choice questions based on school mathematics curriculum for Form One till the early term of Form Three. It was conducted in eight schools in Kelantan from May 2005 through June 2005. Restricted by time constraints, we selected the Form 4 students to be our sample of second group and the Form Three students to be our sample of first group. The first group of students had learned mathematics in English since they entered secondary school, whereas the second group of students had learned mathematics in Bahasa Malaysia since primary school. To our research subjects, Bahasa Malaysia is their mother tongue and English is a second language to them. The data analysis related to the achievement test includes: (a) item analysis of students performance on individual multiple-choice questions; (b) multiple comparison of the over all performance on the SMAT between the two groups and between sexes within the same group; (c) association of variables between performance of the SMAT and academic performance in school for selected subjects. The questions on the SMAT show a satisfactory reliability with Cronbach value of .861 for the script prepared in English; and .773 for the script prepared in Bahasa Malaysia. Our findings on difference in performance accomplished by the two groups of students on the mathematical standard achievement test provide evidence that, when compared with students who learned mathematics through their mother tongue, students who learned mathematics in second language experienced particular difficulties in mastering mathematical terminology and developing cognitive skills and conceptual understanding of mathematics subject matter. The findings of a positive correlation between the performance of the mathematical achievement test and the results of mathematics attained by the students in school has shown indirectly that the instrument we used to measure the students performance in mathematics is to some degree suitable. Besides this, the finding of positive correlation between the performance of the mathematical achievement test and the result of the language medium subject implies that low proficiency of the language medium could be a likely cause of the lower mathematics achievement attained by the students.

# Chapter 1

## Introduction

### 1.1 Background of study

At the beginning of the new millennium, the acute drop in English standard among our school students for all levels has become a hot issue and was widely discussed in local newspapers. At the same time, the impact of globalization and information technology was gradually realized by the government leaders and the elite of the society. This group of people had a consensus that we must do something to halt the drop in the English standard to the normal state of the old days. Otherwise, our new generation will find it hard to compete in the international arena as well as in the recent information and telecommunication era. This is because English has long been established as a very important international language and a popular internet language.

Then, the question rises: who is responsible for the task of raising the standard of English among our new generation? Surely many parties are responsible for, but the main body is the Ministry of Education and all the educational institutions under its supervision. As a pioneer remedial measure to raise the standard of English among our