

# Challenges in Teaching and Learning Mathematics in the Transition to English Medium

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*Abstract:-* Malaysia has two official languages in the teaching and learning process; Malay and English. The Malay language has long since been the language of knowledge and unity in Malaysia whereas English is the international communication language. The objectives of this study are to discuss the challenges language has on the teaching and learning mathematics when both academia and students are confronted to teach and learn through the medium of a new language. Study observes teaching and learning in few aspects such as the readiness of lecturers to teach in English, the inclination and perception of students to learn in English and students proficiency in the language. The native language should be emphasized to ensure the knowledge presented can be grasped wholly.

*Key-Words:-* communication language, students proficiency, Malay language, inclination, perception, native language, readiness

## 1 Introduction

The importance of language in mathematics education is crucial for it covers aspects of teaching, learning, understanding and communication of mathematics. Through the use of language, mathematics becomes meaningful and students are able to communicate the language of mathematics adequately [1]. The objectives of mathematics education are for the students to understand mathematical concepts and possess ability to express their understanding of these concepts [2]. Furthermore, mathematics learners are required to be competent in both communication and mathematics specific language. Nevertheless, competency in the mathematics specific language does not necessarily contribute to competency in the natural language.

The teaching and learning process in Malaysia is bilingual using both Malay and English languages from preschool to university. The Malay language has long since been the language of communication and unity in Malaysia whereas English is the international communication language [3]. (2011). Competency in the first language is an important factor in students' capability to reason in mathematics in English as a second

language. Theories confirmed that an adequate developed first language skill is the basis to achieve a cognitively and academically beneficial form of bilingualism [4].

The policy change of teaching mathematics and science from Malay to English language, which started in 2003 in Malaysian schools' has given an impact to the teaching and learning process in Public Higher Learning Institutions including Universiti Kebangsaan Malaysia (UKM) [3]. The rationale for the shift of the medium of instruction is the basic concern to the government towards human resource development in achieving a developed nation status by 2020 and as a first step to compete in the era of globalization. This is because English is the language of international relations, thus mastering English will facilitate the acquisition of knowledge in the field of Science and Mathematics.

Consequently, the UKM Senate have directed all faculties offering Mathematics and Science courses to start using English as a medium in courses taught in the first year of study. Initially, 30% of the courses are required to be conducted in English and gradually increase in the second and third year to 50% and 70%, respectively. The aim of this paper is to discuss the challenges language has

on the teaching and learning mathematics when both academia and students are confronted to teach and learn through the medium of a new language. Study observes teaching and learning in few aspects such as the readiness of lecturers to teach in English, the inclination and perception of students to learn in English and students proficiency in the language.

## 2 Background of Study

The data of this research was obtained through the dissemination of questionnaires which were distributed to 291 students involving the Faculty of Education and Faculty of Science and Technology. Both faculties were chosen to fulfill the objectives of the research due to the students' background where they had undergone the learning of science and mathematics since their secondary school level until their pursuance of higher studies at UKM. Thus, the perception of these students towards the implementation of teaching and learning Mathematics in English could be measured more accurately.

## 3 Readiness of lecturers

In the School of Mathematical Sciences, there are 36 active lecturers with 28 lecturers (78%) having education at the Doctoral level and the remaining having Master degree. Generally, these lecturers can be classified into three groups, namely those who received both Master and Doctoral educations from foreign universities (i.e. a total of 11 lecturers), those who received both Master and Doctoral educations from local universities (i.e. a total of 7 lecturers) and about 18 lecturers received Master and Doctoral educations from combination of both local and foreign universities. With a variety of academic backgrounds, it is not a major challenge for the lecturers to implement the teaching in English. To date, no complaints have been received by the management regarding this matter.

The results on the lecturers' readiness show that students are generally satisfied with the teaching conducted in English and that lecturers are willing to teach in English regardless of their academic backgrounds and qualifications [3]. These findings are important to UKM to ensure the success of the

university's objective to teach Mathematics courses 100% in English beginning from 2009/2010 academic session.

## 4 Students' inclination and perception towards learning Mathematics in English

The analysis from the survey shows that students tend to have a positive view towards using English as a second language. They are more inclined to use Malay language in learning mathematics and are fully convinced that the teaching and learning of mathematics are more effective if conducted in Malay completely [5, 6]. This was proven by their academic performances. However, usage of English is not totally rejected.

## 5 Students' proficiency in English

Due to deteriorating of the academic performances since the implementation of English language, further study has been conducted to identify the source of the problem. The outcome presents that the use of English in Mathematics courses as a medium of conduct has given an impact on the learning styles among Malaysian students. This is clearly reflected by the percentage of students who achieved excellent results. As an example, in a basic Statistics course, a total of 36 out of 166 students have to repeat the course. 61.3% of those students expect to get a grade of B+ to A but the final results showed that only 36.1% managed to achieve the expected grades [7].

## 6 Discussion

Implementation of English as medium of conduct received a lot of feedbacks and criticisms [5,8] not only in the higher learning institution but also in the primary and secondary schools level [9, 10, 11, 12]. Ministry of Education Malaysia continues to monitor and evaluate the effectiveness of this implementation [8]. The findings exhibit that the achievement in the primary and secondary formal examinations for both urban and rural areas, with Malay language as a medium of instruction is much higher compared to

English as the medium. In addition, for Mathematics, the achievement of urban students dropped from 84.8% to 80.9% while for rural students dropped from 80.9% to 77% [13]. This indicates that the students can understand the teaching and learning in Malay language better as compared to English. The outcome from the UNESCO's study shows that students can easily grasp the lessons in their mother tongue in the early stages of schooling [8]. Trends in Mathematics Science Studies (TIMSS) in 2007 reported that in an international study involving more than 49 countries, the achievement of students in Malaysia for Mathematics dropped from 10<sup>th</sup> place in 2003 to the 20<sup>th</sup> place in 2007 [14].

## 7 Conclusion

The importance of language as a medium for knowledge acquisition, communication and reference cannot be denied. However, in the knowledge transfer process, the native language plays an important role and should be emphasized to ensure the knowledge presented can be grasped completely.

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