

Should English for Teaching Mathematics and Science (ETeMS) in Malaysia Be Abolished?

¹Faizah Mohamad Nor, ¹Marzilah A. Aziz and ²Kamaruzaman Jusoff

¹Language Academy, Universiti Teknologi Malaysia, 81300 Johor Bharu Johor, Malaysia

²Faculty of Forestry, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

Abstract: ETeMS (or English for Teaching Mathematics and Science) was introduced in Malaysia in 2002 to enhance the English language skills of Malaysian learners. The move has however mooted much debate as non-proficient learners were said to have been affected by this regulation as they are said to have fared badly in Mathematics and Science, since the two subjects were taught in English. Following the controversy over ETeMS, in 2010, the Malaysian government decided to revert to teaching Mathematics and Science in the national language, beginning 2012. This research was thus undertaken to gauge the views of learners on learning these subjects in English. The main objectives of the research are to find out if the learners had improved in English, as a result of this move and whether their performance in Mathematics and Science had improved or deteriorated as a consequence of having to learn the subjects in English. The main research instrument used was questionnaires which were distributed to students of a reputable boarding school in Malaysia. It is hoped that the findings of this study would help justify the decision the policy makers have with regard to ETeMS.

Key words: ETeMS • Bahasa Malaysia • Mathematics and Science • Language proficiency • Medium of instruction

INTRODUCTION

The ETeMS (or English for Teaching Mathematics and Science) was introduced in Malaysian public schools in 2002 with the main objective of enhancing the English language proficiency of Malaysian learners. This is because much has been said about the deteriorating level of English proficiency among Malaysian learners. It is felt that learners' English was better off when English was the medium of instruction in schools in the 1960's. When the national language, Bahasa Malaysia was made the medium of instruction in 1970, some quarters perceived this as a reverting point where the use of English language is concerned. Three decades later Tun Dr Mahathir, the then Prime Minister, mooted the move of using English in the teaching and learning of Mathematics and Science subjects, with the noble intention of producing Malaysians who are more linguistically competent and consequently, spearheading development and progress in education, as one of the ways to seek knowledge would be through reading vast amounts of information which is mainly readily available in English, the lingua-franca.

The greater exposure to English, used as the medium of instruction in Mathematics and Science classes would help develop students' language competence. Being competent in the English language is an added advantage to students. For one, upon completing their education, they would be able to perform internationally with this asset. This is based on the fact that English is used as a medium of instruction in many countries in the world. Being competent users of English also means that they are able to gain access to the resources on the Internet since most of the Internet resources are written in the English language. Besides harnessing language and independent learning skills in individuals, the new language policy introduced in the teaching of the two core subjects also aims at upgrading the nation's capability to play a bigger role in technological advancement.

Because ETeMS was a national agenda, it was crucial that teachers played an important role to ensure the success of teaching and learning of Mathematics and Science. Teachers of these subjects had to equip themselves to meet this new challenge of teaching in English. These teachers were given much support in the

form of courses that facilitated them to better understand how English language is used in the content area so as to enable them to deliver their lessons effectively. Good understanding of how language is used in the content area helps develop students' understanding of many specialist forms of language which they need as they progress in the education path.

To help teachers deal with the language complexity of Mathematics and Science, Marsh [1] advocated the concept of teaching through English, not in English. This method emphasizes conceptualizing lessons in English, but at the same time, allowing students to receive instructions in their mother tongue. With sufficient training, teachers adopted the ETeMS policy with good spirits and practised classroom teaching of these two core subjects in English [2].

Like teachers, students too face new challenges with the implementation of ETeMS. Learners for whom English is not their mother tongue, obviously have more difficulties learning Mathematics and Science in English. It is a known fact that the language of Mathematics is complex and is not similar to everyday language. It consists of specialist vocabulary, precisions and the use of symbols. Students learning Mathematics have to verbalize mathematical statements, put words into symbols and graphs and work with lengthy descriptors and dense mathematical concepts. With Science subjects, the challenge of learning these subjects in English is that there is a large vocabulary of technical terms that they may not be familiar with. Despite the challenge it appears to pose to teachers and learners alike, ETeMS has a crucial role to play in developing students who are competent in the English language so that they can keep pace with the rapid advances in science and technology, which is important as English is the language of technology.

Since its implementation, ETeMS has continued to receive feedback, some positive and others negative, from parties interested in the academic developments of Malaysian learners. The Malaysian English Language Teaching Association (MELTA) National Colloquium reported positive feedback on ETeMS and felt that it should be continued (Dec. 2007). The participants of this colloquium agreed that there is a need to continuously improve students' English and learning these core subjects in the English language is a worthwhile strategy to meet the objective.

Despite positive reviews on ETeMS from significant associations such as MELTA, ETeMS made a turning point in 2010, when the Malaysian government decided to revert to the teaching of Mathematics and Science in the

national language. It was decided that the medium of instruction for these subjects would now be Bahasa Malaysia (in national schools), Chinese (in national type Chinese schools) and Tamil (in national type Tamil schools), beginning 2012. The decision was made as the government felt that using the learners' mother tongue would facilitate their mastery of scientific and mathematical concepts, as opposed to the use of English. (Science and Mathematics. Plan will boost BM, English. *New Straits Times*, 2011) [3].

Reverting to teaching Mathematics and Science in the national language brings about implications to Malaysians, in particular, our learners. One of the consequences of this is the possibility of students failing to perform globally because of the language barrier. Some learners were enthusiastic about learning Mathematics and Science subjects in English as they saw this as good preparation for their higher learning pursuits abroad [4]. Reverting to the use of the national language as the medium of instruction for these core subjects denied learners the opportunity to upgrade their linguistic competence.

Because of these mixed reactions to the abolishment of ETeMS, a study was undertaken with the main objective of finding out the effects ETeMS had on Malaysian learners. Not much has been reported on the perceptions and feelings of the learners; the ones directly involved in the implementation of ETeMS. Till this day, it is not clear what the learners actually felt about having to learn these subjects in English.

Although the Malaysian government had already made their decision on the future of ETeMS, the researchers felt that the findings of this study could still be useful to the policy-makers in helping them justify or even consider their decisions. The findings of this study would hopefully comfort us with the fact that we are not taking a step backward if we were already making improvements since the implementation of ETeMS.

The main objectives of this study are to determine if the learners felt that their performance in Mathematics and Science, as well as their English language proficiency had improved as a consequence of learning these subjects in English and to identify the challenges faced in learning Mathematics and Science subjects in English.

MATERIALS AND METHODS

The study was conducted in a boarding school in Johor. This school has charted a number of achievements in the academic performance of students in the Sijil Pelajaran Malaysia (S.P.M.) examinations, at national

levels, in recent years. For instance, the school produced the highest number of students getting all A's in the S.P.M. several years ago. The respondents of the study were Form Four students of the school. The study was conducted at the end of 2006, where these respondents have had about four years of learning Mathematics and Science in English.

The research instrument used was questionnaires. Fifty sets of questionnaires were randomly distributed to fifty male and female students from ten different classes, which comprised learners of similar levels of academic ability. All these learners enrolled in the boarding school after achieving excellent results in their P.M.R. (Peperiksaan Menengah Rendah).

Thus, they were high-achievers academically and were also considerably proficient in English, as they had all scored A's in English at the P.M.R. level. These respondents came from diverse family backgrounds; with parents working in different professions such as managers, accountants, teachers, labourers and drivers.

Of 50 questionnaires sent out, 44 were returned. The questionnaires comprised a combination of four-point Likert-scale items and open-ended items which were related to the learners' perceptions of how learning Mathematics and Science in English had affected them, academic-wise. In the questionnaires, the term 'Mathematics' was taken to mean both the Additional Mathematics and Mathematics subjects while the term 'Science' denotes the three Science subjects taken by the Form Four learners, i.e. Physics, Chemistry and Biology. This explanation was included in the questionnaire given to the Form Four learners.

RESULTS AND DISCUSSION

Learners' Performance in Mathematics and Science: The respondents were queried on whether their academic performance in Mathematics and Science subjects had improved or deteriorated as a result of the move. Nine of the 44 (20.45%) respondents complained that their performance had worsened and attributed this to their lack of proficiency in English which caused the difficulty to understand the explanations of science concepts in English. Inaccurate comprehension of facts and information was formed as a result of their imperfect English.

Six respondents, however, reported that they had fared better in Mathematics and Science subjects after the introduction of ETeMS. Thus, it appears that the number of learners who fared worse (i.e. nine of 44 subjects) outnumbered those who fared better (i.e. six of

44 subjects) in Mathematics and Science after the regulation to teach these subjects in English was introduced. This shows that more students had problems understanding these subjects in English. This happens despite the fact that all these respondents have a good command of the English language, considering they had all obtained A's in the English language paper in the P.M.R. This finding contradicts the findings of a study conducted by Ismail Ikhsan [5], in which it was reported that learners improved in their understanding of scientific concepts when the subjects are taught in English. It appears then that the finding of this particular study confirms the common belief held by the public which is that the ETeMS policy has adverse implications on learners' performance in Mathematics and Science subjects [5].

Learners' Language Proficiency: On whether the learners felt that their English language had improved as a result of the greater exposure to the language now that Mathematics and Science subjects are also taught in English, the findings are as expected. The findings are almost unanimous in which 43 of the 44 respondents admitted that their command of the language has definitely improved.

The only respondent who felt that her English did not improve despite the greater effort to teach learners in English appears to be a learner who has always had a strong dislike for the language. The respondent stated that she did not like learning Math and Science in English and that she felt learning English had always been a problem for her. She also felt that the teaching of these subjects should be conducted in the national language and text books for these subjects should also be written in the national language.

On whether the learners' grades in English exams had improved as a consequence of this regulation, 21 of 44 (47.7%) respondents reported that their English grades had improved. They related this to the fact that the move to teach Math and Science in English had offered them more opportunities to learn the language. If prior to the introduction of this regulation in schools, learners were only exposed to learning the language during English lessons, now, the move has offered them greater exposure to the language. Not only were they learning English in English classes, but they were also gaining more familiarity with the language that is used to teach Mathematics, Additional Mathematics, Physics, Chemistry and Biology lessons as well. Thus, the increased exposure had definitely led to increased performances in their English exams.

Level of Enjoyment of Learning Mathematics and Science in English: 25 of these 44 learners (56.8%) revealed that they enjoyed learning Mathematics and Science in English while 9 (20.5%) admitted otherwise and that they preferred instead, the national language as the medium of instruction for these subjects. One respondent did not respond to this questionnaire item on whether he liked Mathematics and Science being taught in English. This probably meant that he was indecisive and did not mind either language used as the medium of instruction for the Mathematics and Science subjects.

Level of Difficulty of Learning Mathematics and Science in English: One of the benefits of Mathematics and Science being taught in English is that the explanation of concepts is easier to digest when delivered in English. Sixteen of the 44 (36.4%) respondents felt that it was easier for them to understand the mathematical and science concepts if they are explained in English compared to the national language. This is probably due to the familiarity with the terms used in English as they had already been learning these subjects in English for four years then.

Another reason for learners finding it easier to understand the explanation of concepts in English is that the explanation of scientific concepts sometimes gets a bit long-winded when explained in the national language. Sometimes, the text in the national language is a literal translation of the original text which is initially conveyed in English. Hence, it is not surprising that the explanation is clearer in its authentic form.

On their general perceptions of the difficulty of learning Mathematics and Science in English, 25 out of 44 (56.8%) learners admitted it was actually difficult while 16 (36.4%) felt that this was an easy task. Two respondents, however, could not decide if it was easy or difficult learning Mathematics and Science in English, while one respondent claimed it is both an easy and difficult task. This shows that the learners had mixed feelings on this issue. However, there was a higher number of learners who perceived learning Mathematics and Science in English as difficult as opposed to those who viewed it as easy. Nonetheless, learners who confessed to this being a tough chore admitted that they were able to take the challenges in their stride because they wanted to prepare themselves for bigger challenges which lie ahead, such as equipping themselves with good language skills to study abroad.

When asked for the factors that made learning these subjects in English difficult, 19 learners or 43.2 %

of the 44 respondents were of the opinion that they were hindered by their own lack of proficiency in English. An equal number of learners, i.e. 19 of them felt that learning these subjects in English had been tough because their teachers did not have a sufficient level of English language proficiency to make the lessons easy on them. This shows that the learners attributed the difficulty in learning Mathematics and Science subjects in English to their own limitations and those of their teachers.

It is unfortunate that the teachers' views were beyond the scope of this study; otherwise, they could have been interviewed to find out their reactions and defence on the negative feedback leveled at them. However, Kon [6] in his study, discovered that Mathematics and Science teachers do have high teaching efficacy beliefs in themselves and claim to have the ability to teach well so as to affect students' performance.

CONCLUSION

It can be concluded then that learning Mathematics and Science in English is difficult for learners and their academic performance in these subjects have deteriorated. Although they did feel that their English has improved, there was no indication of this in their English exam results. Probably, one plus point of ETeMS is that learners enjoyed learning these subjects in English and this was probably due to the novelty of the idea. This study of ETeMS implies that more students had actually declined in their performance in Mathematics and Science subjects. Almost all of the students felt that they had improved their English proficiency as a result of the greater exposure to English where almost half of the students (47.7%) reported that they now fared better in English exams. More than half of the students (56.8%) enjoyed learning Mathematics and Science in English. Some students (36.4%) felt it was easier to understand the mathematical and science concepts that are taught in English. More students (56.8%) felt it was difficult learning Mathematics and Science in English compared to those who felt it was easier (36.4%). Learners attributed the difficulty in learning Mathematics and Science in English to two reasons: their own lack of fluency in English (50%) and their teachers' limitations in English (50%).

Although the findings of this study seem to suggest that ETeMS should be abolished, the researchers feel that these findings are insufficient in making a big decision that would affect Malaysian students throughout the

nation. More big-scale studies involving all types of schools should be conducted to confirm or reject the findings of this small-scale study.

REFERENCES

1. Marsh, D., The 3rd TED-ELTC (Teaching Education Division-English Language Teaching Center for the Teaching of Mathematics and Science) Conference 2007. Organised by the Education Ministry's Teachers Education. Seremban. 2007.
2. Cheah Li Na and Nor Azmi Mostafa, 2009. Teacher Beliefs and the Teaching of Mathematics and Science in English. *English Language J.*, 3: 83-101.
3. Language for understanding as a perspective 1997. Language for Understanding Curriculum Support Paper, Australian Capital Territory, Department of Education and Training and Children's Youth and Family Services Bureau Science and Mathematics. Plan will boost BM, English. *New Straits Times* Sunday, January 02, 2011.
4. Faizah Mohamad Nor and Marzilah Abd Aziz, 2008. ETeMS; The Implications on Learners. Paper Presented at the ILC 2008 (International Language Conference 2008). Organized by IIUM, Kuala Lumpur. pp: 3-5.
5. Ismail Ihsan, 2009. English in the Teaching of Mathematics and Science Subjects (ETeMS) Policy. Implications for the Performance of Malaysian Secondary Schools in Mathematics and Science Subjects. *European J. Operational Res.*, 2: 429-444.
6. Kon Yoon How, 2008. Teaching Efficacy Beliefs of Primary School Teachers in Using English to Teach Mathematics and Science. *Jurnal IPBA.*, 3: 2.