GLOBALISATION AND LANGUAGE – IN-EDUCATION POLICY SHIFT IN MALAYSIA: CHALLENGES OF IMPLEMENTATION

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ABSTRACT

Among the many measures taken by Malaysia to face the demands of global competitiveness is a major shift in language policy from Bahasa Malaysia to English for Science and Mathematics at various educational levels, from primary, secondary to higher education levels. This chapter will have a dual thrust of unraveling the main reasons for the change in language policy as well as examining the challenges for the implementers on the ground, the teachers. For a nation that has been using Bahasa Malaysia as language of education for the past 30 years, this shift to English as the language of instruction for Science and Mathematics has inevitably brought about a number of challenges. Immediate steps were taken by the Ministry of Education of Malaysia to address these challenges. One of the education initiatives taken was the development of a national programme on English teaching for science and maths (ETeMs), by the English Language Teaching Centre (ELTC), a teacher education division entrusted with the task of retraining teachers. This initiative, in turn, faced new challenges, in particular, varying levels of English competency among Science and Maths teachers, compressed scheduling of in-service training, lack of networking after training, underutilization of self instructional materials, challenges including the less than successful collaboration among the Science and Maths’ teachers and English Language teachers. The evaluation of the language-in-education policy shift is currently underway. Six years after its implementation, the fate of the English language as a medium of instruction for Science and Mathematics lies very much in the hands of the policy makers. The literature on the challenges faced tends to suggest that it is perhaps too early to evaluate the success of the shift in the medium of instruction from Bahasa Malaysia to English for the teaching and learning of Science and Mathematics. More time is needed for a fairer evaluation of the change in language in education policy.
Introduction

Post-colonial nations maneuvered freedom from the shackles of colonial powers through political, educational and socio-cultural re-affirmation. Through the educational systems, one of the most common assertions of national identity was the establishment of a national language in place of the colonial language. Malaysia, after being colonized in the 18th, 19th and first half of the 20th century, gained independence from the British on the 31st August 1957. One of the earliest integral initiatives for this young nation was the replacement of the colonial official language of English with Bahasa Melayu. This initiative was impacted by the spirit of nationalism and for the dominant ethnic group (for whom the language was their mother tongue) to reaffirm their identity and to provide them with a strong sense of recognition and legitimacy amongst the various other ethnic communities in Malaysia. (Emerson, 1960: 152) (Horowitz, 1985: 185) This change also provided a platform for a common language to be legislated as the official language for both educational and administrative purposes and which over the years, would function as the linguistic means for the promotion of unity amongst the various ethnic groups in Malaysia.

There was a need to create space and recognition for Bahasa Melayu in the post-independence period because English had already established itself as the language of economic opportunity and social mobility in the pre-independence period. As Asmah explained, “… the introduction of English created two classes of people based on education – those educated in English (i.e. predominantly Chinese, urban Indians and Malay elites) with the connotation of high education, high office and socioeconomic power and those educated only in the vernacular languages (i.e. commoner Malays and labouring Chinese and Indians) with the connotation of peasantry, cheap labour and petty trading.” (Asmah Haji Omar, 1995: 159 cited in Kaplan and Baldauf, 1997: 197)

To rectify this social and economic imbalance, the Malays felt strongly that the institution of Bahasa Melayu as the national language, its legislation as official language and its development as language of knowledge was necessary to provide it with educational and administrative capital that would lead to its development as a language of higher status. Therefore, having mastery of this language would provide the Malays with linguistic capital with greater value for economic opportunity which would then lead to social and professional mobility. Through the landmark recommendation of the Razak Education Commission in 1956, the Government implemented the National Education Policy,
which stipulated Bahasa Melayu as the medium of instruction in schools (Report of the Education Committee, 1956:4). The aim of this policy was to remove the identification of a particular ethnic group with school achievement and reduce the inequality of opportunity among ethnic groups.

As a consequence, during that post-independence period, English, which used to be the medium of instruction in the educational system and which had a powerful status not only nationally but also internationally, through its economic and technological power and roles, was given less importance than Bahasa Melayu. From its role as medium of instruction it became a subject in the school curriculum, a subject that was compulsory to take but not to pass. If its status had not been reduced, then Bahasa Melayu would not have had the opportunity to develop its status in competition with such a powerful language.

A crucial element in the success factor of the implementation of the language as language of knowledge was the need for published / translated materials in the native language. Gonzalez depicts this by arguing in the Philippines context that until a language has intellectualized or cultivated, which is best done at the tertiary level in universities, school based programmes can only reach a limited plateau. (Gonzalez cited in Kaplan & Baldauf, 1997: 200) Therefore, in the same light, for Bahasa Melayu to be taken seriously as an intellectual language and to truly gain educational capital, it needed to be modernized as well as academics needed to be encouraged to write / translate specialized knowledge in the native language. Therefore, amidst the various challenges, the first thing that needed to be done was to modernize the language. Given its multi-functional value and importance, large amount of resources were injected to facilitate the implementation of both status and corpus planning to develop and establish Bahasa Melayu as the national language, the language of administration and the language of education over a period of 30 years, from 1952 to 1982. (See Asmah, 1979 for details on both status and corpus planning for the development of Bahasa Melayu).

After thirty years of the legislation and implementation of Bahasa Melayu in the education system, and all the efforts at modernizing it, the 80s signaled the onset of globalization and its related challenges. Nations around the globe were facing the challenges of globalization and the newly emerging knowledge economy and the impact of these factors on education, language choice, and human resource development. These new challenges brought along with it contrasting decisions, decisions that reversed earlier ones re: language-in-education policy. Many post-colonial nations
began re-examining the language policies that had been implemented in the throes of linguistic nationalism in the post-independence period. This was largely because of the winds of change driven by forces of globalization and the knowledge economy which were affecting the economic and knowledge driven priorities of many nations around the globe. In these times of critical dependence on the knowledge economy / technology ideologies, nations needed to develop human resource that is able to access and use knowledge and information in the field of science and technology, which is largely in English. Thus languages began to be viewed as “economic commodities” possessing “linguistic capital” rather than “symbols of ethnic or national identity.” (Block, D. and Cameron, D. 2002: 5) As a result, language policies began to be driven by forces of pragmatism, based on the need to develop knowledge economists and innovators in various fields of science and technology.

Thus this led in 2003, to a drastic major change in Malaysia’s language in education policy. This was a change from Bahasa Melayu to English for science and maths. This leads us to the following sections of the chapter, which focuses on both the political reasons for and the impact of the change on pedagogical perspectives, focusing on teachers. The need to adopt this approach is emphasised by Tollefson and Tsui when they say, “In analyzing medium-of-instruction policies, it is always important to include both pedagogical and political perspectives.” (2004: 292)

This chapter has a two pronged focus. Firstly, it explicates the underlying reasons for the change in language policy and secondly, it moves onto the challenges for its implementation. We begin by briefly unraveling the main reasons for the change in language policy, focusing largely on the viewpoints of the person who was instrumental for the change, the former Prime Minister of Malaysia, Tun Mahathir. Thereafter we examine the research literature on the challenges faced by the stakeholders integral for the implementers of any language-in-education policy: i.e. the teachers. This will involve describing and examining the training and support provided for the teachers to equip them with skills and knowledge to cope with this change. This incorporates the theoretical underpinnings and the different phases of the national programme developed by English Language Teaching Centre (ELTEC) aimed at enhancing the language proficiency of mathematics and science teachers and their continuing professional development. It then moves onto the challenges faced in the training of the maths and science teachers. The second half of the chapter draws in voices from society and provides space for them to express their support and dissent against the language policy. This is supported by research on the pedagogical impact of the policy on the ground and the socio-political reasons for the change.
A top down approach: Reasons for Change in Language Policy

A sudden change in the language of instruction was announced in the mass media on the 11th of May 2002. (Mahathir Mohamad, New Straits Times, 11 May 2002: 1) This led to a reinstitution of English as the medium of instruction for science and maths in the national schools in a staggered fashion – beginning with Primary One, Secondary One and Lower Six.

This was a top-down decision on language policy, driven largely by the former Prime Minister of Malaysia, Tun Mahathir Mohamed, who had mainly practiced a form of “autocratic democracy” in his decision-making processes during his 22 year term as Prime Minister. The duration from the date of announcement to his stepping down from office was 17 months and 20 days to be exact. “Top-down” language planning is carried out by people with power and authority (many of whom make up the government) who make language related decisions for the nation, often with minimal consultation with the grassroots language learners and users. (Kaplan & Baldauf, 1997, pp.196). Therefore, it was crucial to obtain from him first-hand the reasons for which the policy change had been instituted. As part of a research project (Gill, et al, 2003-2005) during which he was interviewed, when he was asked why the change had to take place, he said,

“Education is for the purpose of acquiring knowledge. The most important thing is the acquisition of knowledge. If you have to use a language which makes the knowledge more easily accessible, you should use that language. ….. Our education system is like any other education system. It’s meant to enable us to acquire knowledge. If we have the knowledge available in the national language, by all means, do …. but the fact is that in science the research that is being done is moving at a very fast pace. Everyday literally thousands of papers on new research is being published and practically all of them are in English. To translate English into Bahasa, would require a person with 3 skills. Skill in the 2 languages and skill in the subject that is to be translated and we don’t have very many people who are qualified to do that or who wish to do that. That is why it is easier if you learn English and the students can have direct access to all the knowledge that is available in English. (personal communication, 16 June, 2005)

It must also be kept in mind that this was made against the backdrop of the aim of the nation to be an industrialized nation by 2020. In this context, the issue of developing relevant human capital becomes critical. This needed to be human capital which has the capacity not only to acquire knowledge but also to innovate particularly in the fields of science and technology. Therefore, given the
gargantuan proliferation of knowledge published in English in the field of science and technology, it was felt essential for Malaysians to be able to access this with immediacy. (The reasons for the change are explicated in greater detail in Gill (2005) and David and Govindasamy (2005)).

In arguing a case for the need to reinstitute this change in language policy and to garner support for it, Mahathir redefines the concept of nationalism by asserting that, “We need to move from the extreme form of nationalism which concentrates on being a language nationalist only, not a knowledge nationalist, not a development oriented nationalist. I feel that we should be a development oriented nationalist. We want our people to succeed, to be able to stand tall, to be respected by the rest of the world. Not to be people with no knowledge of science and technology, very poor, very backwards, working as servants to other people. If we have no knowledge we will be servants to those with knowledge.” (personal communication, 16 June 2005)

Examining the Challenges for the teachers

It must be remembered though that the successful implementation of a new language policy can only be carried out if teachers are provided with clear guidelines as to the policy and the structural support and resources needed for its implementation. This should include being informed of the reasons for the change, provision of training to assist teachers cope with the change, helping to develop the linguistic competency of teachers and the educational resources needed for the implantation of language policy.

Teachers of maths and science have been teaching in Bahasa Melayu since the latter was instituted as the medium of instruction in the education system since post-independence days. In parallel, with the marginalization of English, exposure to the English language became much reduced, compared to when it used to be the language of education. All of these decisions resulted over the years in the development of a generation of students and teachers who were more fluent in Bahasa than in English. This is not surprising given that the teaching of content subjects in the national language provided students with an environment in which they were immersed in the language. Immersion facilitated acquisition and competency of Bahasa Melayu for teachers and students of various multi-ethnic communities.
This greater competency in Bahasa than in English raises one of the major challenges facing the recent change in medium of instruction policy, that is, the competency of the teachers of science and maths in the English language. Can teachers who have been teaching Mathematics and Science in Bahasa Melayu for decades now use the English language to deliver content? A sampling of literature in this area provides us with an idea of the challenges faced by teachers in implementing this policy. Yeow (2003: 1) states that “while these teachers are pedagogically competent, some of them would face difficulties in teaching Maths and Science through another language.” Similar views are presented by Pillay & Thomas (2003: 29) who posit that these teachers ‘display inadequate proficiency in English for content delivery” and Kon (2005: 46) who maintains “teachers were skeptical about their own confidence and capabilities in delivering the subject matter in English”.

Research amongst teachers supports the importance of and need for teacher preparedness and readiness to facilitate the switch in medium of instruction. Pandian and Ramaiah (2004) discuss the language inadequacies among teachers and how this is an obstacle in helping to bring about the required changes in their learners. Kon (2005) working with primary school Science teachers, concluded that while the teachers had oral fluency and could use the English language to teach Science, they expressed less confidence in pronunciation of words and terms in Science. Noraini Idris et.al (2007) highlight the fact that many teachers perceived they needed more training in preparing themselves to speak and deliver in English, conduct question and answer sessions, and guide students to use English in class itself. Choong (2004) states that teachers who cannot articulate their thoughts in the English language will find it impossible to develop conceptual understanding in their learners.

The task of retraining teachers was left to the teacher education division which appointed the English Language Teaching Centre (ELTC) to develop a national programme aimed at enhancing the language proficiency of mathematics and science teachers. (Pandian & Ramaiah 2004, Choong 2004). We now move on to tracing the implementation challenges in instituting the language-in-education policy change for science and maths in the Malaysian education system by examining the training and support provided for the teachers.

Theoretical Underpinnings of programs conducted by ELTC
The theoretical underpinnings of the training programme developed by ELTC rested on the development of content knowledge in English (Choong 2004). Instrumental to the design of the programme was Cummins work (1979, 1981), although the aforementioned work focused on learners and not teachers. Cummins proposal on the development of cognitive academic language proficiency (CALP) can be applied to teachers to ensure they have the required proficiency to make sense of academic language in context-reduced situations.

Cummins (1979) posits that there are two differing language proficiencies – basic interpersonal communication skills or BICS and cognitive academic language proficiency or CALP. Most speakers acquire BICS or the ‘surface’ skills fairly quickly as these are the social skills that enable them to interact with other speakers. CALP however, is used for formal academic learning. Cummins (1979) further states that it is possible to attain native speaker fluency within two years of learning a target language while it can take as long as 7 years for academic language to develop. This is because academic language is cognitively demanding as new ideas, concepts and language are taught simultaneously. What is important to know is that what is learned in the L1 can be transferred to the L2 because conceptual knowledge developed in one language helps make input in the other language comprehensible (Cummins 1981). Hence the learning of academic content in English for Mathematics and Science can be made easier when academic language is nurtured and developed simultaneously.

Cummins’ BICS and CALP have formed the basis for many language programmes to help improve proficiency. One such programme is the Sheltered English programme that helps develop content area knowledge, academic skills and improved proficiency in the English language. This programme provides opportunities for learners to learn English by using it to understand content knowledge. Using clear, direct and simple English, teachers communicate meaningful input in the content area to students using a variety of methods like extralinguistic cues (pictures, charts, maps) props (physical objects) and body language (Parker 1985); linguistic modifications during speech (Parker, 1985); interactive lectures, cooperative learning strategies (Kagan 1985); employing a focus on central concepts using a thematic approach; and developing of suitable strategies to develop thinking (Langer & Applebee, 1985). The various methods employed here illustrate how the communication process can be enhanced and meaningful input put forth for learning.

ELTC was designed along similar ideas as the Sheltered English programme because it stressed the idea that using English to develop content knowledge could lead to better proficiency in the
language itself. Pillay & Thomas (2003) posit “the premise is that cognitively challenging and complex academic content can be taught in a linguistically simplified manner by ensuring that the material is taught in “context embedded environments” that is an environment where the teaching and learning is fully supported by the use of various media (27).”

The effectiveness of Sheltered English depends on the teacher’s ability to teach in English without altering the content i.e. there should be no watering down of course content. At the same time the teacher must ensure students have opportunities to develop their academic language which means there must be effort to enhance communication in English in class. Teachers can do this by using simple structures in the early stages and then move on to more complex structures when content is more comprehensible. This integration of content and language seems to be what the training division and ELTC had in mind when they designed the training programme which will be discussed below.

**ETeMS**

The training programme developed by ELTC is known as English for Teaching Mathematics and Science (ETeMS). The programme had a two fold thrust – to enhance language skills of mathematics and science teachers for effective teaching using English as MOI and to enhance teachers’ continuing professional development (ETeMs 2004). This training programme was made available to all Maths and Science teachers throughout the nation and was conducted in the various states to enable all teachers to attend the training. A total number of 50,000 teachers underwent training to equip them with skills and competencies to deal with the change in MOI. ELTC recognized that focusing on the development of content knowledge only was insufficient as the change in medium of instruction necessitated a fundamental understanding of both content and language issues (Choong 2004). Hence the training of teachers should focus on both productive and receptive skills to ensure the development of language skills. The underlying premise here was that teachers should already possess the content area knowledge and pedagogical skills and needed to develop the basic proficiency to enable them to deliver this content effectively in the target language. The programme had as its underlying focus the development of language for accessing information, for teaching mathematics and science and for profesional development. According to Pillay & Thomas (2004 p.7) “The programme had to incorporate elements of activating teachers’ English language proficiency as well as developing a specialist language to cope with teaching mathematics and science in English.”
ETeMS centred on 240 hours of instruction and adopted a 5 pronged strategy comprising

- Interactive Phase 1 (language- based with subject content)
- Interactive Phase 2 (language and subject with technology)
- Self-instructional package for self-directed studies (print and non print)
- Internet based learning through freeware (material available for use on the Internet)
- Buddy support system

**Phase 1 -ETeMS**

30 % of Phase 1 was focused on developing language for accessing information while 70% focused on language for teaching mathematics and science. It was hoped that this would provide teachers a head start in developing basic language skills needed to begin teaching in English for content subjects. This phase was delivered by means of 5 modules distributed over a period of 5 weeks involving a total of 60 hours. Each module took place over 2 days of face-to-face interaction. Thereafter there were 30 hours of a 5 day module and finally 30 hours of a self instructional package.

The 5 modules in this phase consisted of a series of sessions over a period of 2 days and comprised text labs, language labs, stand and deliver and back to the future sessions. The text lab was to help teachers develop reading skills based on maths and science texts. Using the texts as a stimulus for a lesson teachers learn how to exploit the texts for vocabulary skills, grammatical, discoursal and linguistics features. Teachers are encouraged to use English to discuss how they could structure their lessons thereby helping to develop their confidence levels. The language lab sessions provided opportunities for teachers to develop language competence with skills like explaining concepts, describing etc. with a reference to accurate grammatical structures. The stand and deliver sessions were avenues for teachers to practice the language learned in the earlier two sessions in simulation exercises. The back to the future sessions enabled teachers to reflect on their learning experience and look ahead to future goals. At the end of each module teachers are encouraged to assess their own self development to see how much of progress they have made and also to develop confidence in their abilities. The self instructional package helped supplement the delivery provided through the modules and were to be used by teachers for self access learning.

The 5 day module provided a means of sustained immersion in the English language as it was delivered at a live-in training venue for teachers. This module entailed cohorts of trainees developing
and practicing scripted lessons which would go into a bank and be made available for all teachers. The aim of the intensive practice was to help prepare teachers for classroom instruction.

**Phase 2 - ETeMS**

Phase 2 was developed from the feedback received from Phase 1 and also involved 90 hours of face to face interaction supported with self instructional materials. The first part of Phase 2, involving the face to face interaction had 3 modules – Alpha, Beta and Gamma – to further develop teachers’ competence in relation to the pedagogical aspects of teaching of mathematics and science (Facilitator notes ETEMS Package 2004).

The Alpha Module focused on note making and task design while grammar and vocabulary were developed concurrently. The Beta Module set out to educate teachers on the use of the multimedia courseware supplied by the Ministry of Education and helped build on teachers’ ability to write test items. The Gamma Module focused on helping teachers with classroom presentation skills and developed their pronunciation abilities. The second part of Phase 2 – the development of self-instructional materials- involved active participation of the teachers in the development of a portfolio of materials they could use in their own classrooms and inherently built on their confidence to extend their mastery of English independently.

**The Buddy Support System**

While there was a good training program designed by ELTC to assist teachers cope with the switch in the medium of instruction for the teaching of maths and science, there was also awareness that teachers still needed a resource in their individual schools to help them. This additional support was the buddy system where another member of staff would serve as a critical friend and help maths and science teachers with language problems.

This collaborative support structure was based on the understanding that there was a critical friend who could be either an English subject teacher or a maths and science teacher who was competent with the use of English to teach. This critical friend would act as a buddy and assist the teacher in the use of language to teach maths and science. Ideally of course if the critical friend could also be a maths and science teacher who was competent in the language then help could be provided in both the content and language as well.
Selected language teachers underwent training as master trainers to equip them with the skills for helping their fellow buddies back at school. The master trainers were equipped with training skills through the MaSTT (Mathematics and Science Trainer Training), a training programme developed for master trainers in Malaysia through the collaboration of the Teacher Education Division of the Education Ministry and the College of St Mark and St. John, United Kingdom. The MaSTT, which builds upon the experiential learning model, is designed to make the master trainers think about training and develop critical thinking skills. These trainers are also trained to think and reflect upon the kinds of materials used as well as the needs of the people they are training.

The Challenges of the training of Math and Science teachers

ETeMS, which is a comprehensive training programme, has been in existence for 5 years now since 2003, and given the timeline, it would be appropriate to examine the challenges that it has faced. Research carried out on the ETeMs programme and opportunities provided for teachers to voice their views (Subramaniam & Mardziah 2007) have seen a number of issues being raised on the effectiveness of the training in helping teachers and also in enhancing their professional development. These issues are the varying levels of English competency among the maths and science teachers, the compressed scheduling of in-service training, the absence of opportunity for professional development among teachers, the underutilization of instructional resources, the not so friendly buddy system and finally the neglect of the recipients or learners. These were all issues that clouded the implementation of the ETeMS project (Subramaniam & Mardziah 2007). We will now examine these issues in the following sections.

Varying levels of English competency

It was discovered that training the teachers was not a clear cut matter because of the varying levels of English competency among teachers. This was because most of them had completed their own education in the national language, Bahasa Malaysia. This in turn meant their proficiency in English was largely inadequate. At the same time, there were teachers, who were senior and had been through the English medium of education. Due to different exposure and background, these teachers had good language competencies. Hence trainers had difficulty pitching their modules appropriately due to the varying levels of proficiency among the maths and science teachers.
Norzita (2004) (cited in Khiruddin Ahmad 2007) surveyed 86 Maths and Science teachers of Form 1 classes in an urban school in Seremban, the capital of the state of Negeri Sembilan, and found their level of proficiency and competency was low and even with training they needed continuous support. Kamsilawati Kamlum (2005) reminds us that many teacher trainees are not interested and do not have the ability to teach in English so it is unrealistic to expect them to implement the change in MOI. Using a questionnaire she investigated Maths and Science teacher trainee perceptions of their readiness to teach ETeMS by focusing on their proficiency and support and facilities provided by the school. Her research found that the reality of the situation is that they are struggling to learn terms in English and in addition they have to familiarize themselves with instructional language in English. This places both teachers and learners in a very disadvantageous situation. A teacher can be highly knowledgeable in content knowledge but if this knowledge cannot be communicated to the students then nothing is taught and the teacher is seen to have failed.

*Compressed Scheduling of in-service training*

The original plan was to minimise disruption in schools by reducing the number of hours teachers left their classes for training. This led to the provision of in-service training over the weekend. However the usual practice of a weekend training stint has proven to be of little value, more so if the aim is to help improve proficiency. This is because of the lack of opportunity for any hands-on-learning during the weekend stints. Hence the Ministry of Education opted for a five day training package simply because it was easier to organize logistically. The difficulty of getting all the trainers and teachers together in one place at one time, finding a suitable training site, ensuring there was sufficient software for the teachers to obtain hands-on-training and of course, the costs incurred proved too challenging to coordinate.

*Lack of networking (post training)*

When training is conducted according to specific time intervals over a period of time, teachers have the opportunity to try and apply what they have learnt from the session and discuss with other teachers’ techniques that were successful in the classroom. But when teachers only meet once or twice for training and do not have any further contact they have no avenues to talk about their experiences and share them with members of the group. Choong (2004: 5) explains what is lacking. She says that, “The need for face-to-face interaction and some time for socialization and learning for an extended
period during ‘immersion’ is critical for language learning to be of any impact especially for this target group of teachers who share the same subject knowledge”.

This meant there was no opportunity to share experiences on what was feasible and what was not and the outcome of this was the absence of on-going professional development for the teachers. Bearing in mind that the ETeMS programme set out to enhance teachers’ professional development, the lack of opportunity for teachers to share personal experiences and form networks to exchange ideas was unfortunate. When the programme does not allow teachers to spend some time talking to each other and sharing their reflections they have no opportunity to improve on their pedagogy.

**Underutilization of self instructional materials**

Self directed learning resources in the form of a self instructional package, grammar books and dictionaries were given to teachers to help them enhance their knowledge in their respective fields. Even with the provision of laptops for each Science and Mathematics teacher, teachers were not optimizing the self instructional package. The findings from the Malaysian English Language Teaching Association’s (MELTA) National Colloquium on Teaching of Mathematics and Science in English held on 11th December 2007 highlights a number of reasons why teachers have not fully utilized the instructional material (Subramaniam & Mardziah 2007).

Many teachers claimed that the textbooks, for both mathematics and science were inadequate in that they did not provide enough examples and only carried brief descriptions of the content. This meant the teacher and the students had to do a lot of reading outside the classroom which was seen to be burdensome to both groups especially since the readings were in English (Pandian and Ramaiah 2004). This is indeed a sobering thought because if teachers find it burdensome to read materials in English they must clearly lack language competencies.

The multimedia courseware was also unsuitable as students with low proficiency said they were not able to understand the language in the courseware. Tajul Ariffin & Nor’Aini (2002) (cited in Kamsilawati 2005) state that while the more senior teachers could cope, the younger teachers (who had been trained in Bahasa Melayu) were struggling with the courseware themselves and also with having to explain the language to the students.

**Collaboration through the buddy system**
Collaborative teaching between maths and science teachers and English teachers was not always feasible owing to a number of constraints. The lack of time and heavy workloads prevented teachers from wanting to form such partnerships. In addition, low levels of competency in English resulted in a situation which left a lot to be desired.

Choong (2004) states that senior maths and science teachers were suspicious of the involvement of English language teachers as trainers. Many of these content teachers considered themselves proficient in English and were not so receptive to the idea that they would have to undergo training to teach in English. In addition they were resistant to being grouped with other Maths and Science teachers who were not proficient in English. When they were made to go for the training they ended up being critical of everything and were disruptive to the training.

Khiruddin Ahmad (2007) reveals that language teachers are willing to help but they are not so confident they can assist the Maths and Science teachers translate terms which they themselves were not so sure about. These language teachers themselves learnt Maths and Science in Bahasa Melayu and their limited ability to understand the subjects in English was an obstacle to them helping the Science and Maths teachers. Hence, once again, poor competency levels was an obstacle to collaboration among teachers.

**Voices For and Against ETEMS**

Amidst mounting pressure from several quarters, the Ministry of Education organized roundtable discussions to which select parties were invited. These were closed-door affairs. The invited parties included representatives from the National Union of the Teaching Profession (NUTP), educationists from the main political groups, Parent Teacher Associations (PTAs), members of the academia and key members of language-based organisations. The Minister of Education, Hishamuddin Hussein explained the aim of these sessions, which were, “to review various studies undertaken to assess the programme’s implementation before the ministry announces its decision in December 2008 on whether to continue with teaching the two subjects in English.” (New Straits Times, 2008, July 10: 8)

Subsequent to these announcements, in the months of July, August, September and October 2008, there were numerous articles and letters written to the print media arguing in some cases, for support of and in others, arguing against the implementation of teaching science and maths in English.
Due to the lack of published academic material, an analysis of the some of the articles/letters published in the print media will be carried out to assess society’s responses to this very important issue.

The voices are based on two ideological approaches for and against the use of English for science and maths. The voices against are based on the premise of linguistic nationalism and the advantages it brings to particularly students from the rural areas, who largely constitute those of the dominant ethnic community, the Malays. This is similarly articulated by Tollefson and Tsui when they analyse the Malaysian situation. They say, “In Malaysia, Bahasa Malaysia remains strong, particularly among the educational elite, as a symbol of Malay nationalism.” (2004: 291) The voices supporting the policy are based on development-oriented nationalism (as originally stressed as one of the reasons for the reversal of medium of instruction from Bahasa to English) and the fact that the use of English facilitates direct access to knowledge and information in English, adds value to the educational system and assists with the development of the human capacity that the nation needs in the face of international competition. The underlying premise of this approach was “a result of perceived inadequacies of Bahasa Malaysia in science and technology ... to prepare learners for higher education in English.” (Tollefson and Tsui, 2004: 292) It must be stated that this is a challenge that not only Bahasa Malaysia faced but many other national languages faced as well - the challenge of keeping up with translation of the gargantuan proliferation of knowledge in English in the field of science and technology.

One of the key articles titled “Revise policy for 3 reasons” written by Rosnani Hashim, from the International Islamic University, stresses that it is important to revert to Bahasa Malaysia as the language of science and maths for the following reasons: “firstly, for the simple pedagogical reason that our teachers have not been trained in English and they are not proficient to teach the subjects in the language. ..... Second, Bahasa Malaysia has been the language of democratization of higher education in this country, as our history has shown it acts as an equalizer. ... the Education Policy has helped narrow the gap between the rich and the poor and created a bigger base of middle class, which is a stabilizing factor in society. ... Third, this policy, if continued right from primary school-level will slowly cause the death of Bahasa Malaysia as the language of intellectualism.” (Star Education, 28 September 2008: E4)

Teachers constitute the most important element in the implementation of language policy. Whether it is just or unjust, they are the human resource that most impacts on the development of the human capacity needed for the nation. Therefore, in the case of change of language policy, they are the
ones who have to carry most of the burden of implementation. If they are not convinced of the reasons for the need for change and do not put their heart and soul into improving their proficiency levels, then the policy is doomed to fail. This is the message that is being disseminated via this article as well as research that has been conducted and presented at the round-table dialogues.

One research project that was made public and immediately received much attention was a study led by Isahak Haron et al. (2008) of the Universiti Pendidikan Sultan Idris (UPSI) (translated this is the University of Education, Sultan Idris). Broadly, the findings revealed a rather dismal scenario as a result of the implementation of the policy. Two of the main findings will be mentioned here. The first is, that “70% of the students from the primary schools ‘do not/ barely comprehend’ their teachers’ teaching of Mathematics and 80% find it difficult/fairly difficult’ to learn Mathematics and Science in English”. And secondly, on the use of the English language as the medium of instruction, more than 80% of the students reported that the teacher code-switched from English to Bahasa Malaysia and vice versa as a strategy to promote teaching and learning. It thus calls for a review of the policy and for the use of Bahasa Malaysia to be reinstated for the two subjects.

Unlike Haron et. al. (2008) not all research presents a picture of doom and gloom. In a study that employed a questionnaire survey involving 575 teachers randomly selected from the whole of Malaysia, Hamidah Ab Rahman, et al (2005) enquired into the teachers’ competency in the teaching of Mathematics and Science as a result of the training programs that were aimed at preparing them for the classroom as well as boosting their confidence. The project also investigated “whether or not the training given was adequate and relevant to the needs of the teachers…” (p. 31) The findings reported that the implementation of the teaching was satisfactory, that the teachers felt that they have improved their command of the English language and that their level of confidence to teach Mathematics in English have also improved.

As this study was survey based, it is difficult to form a holistic picture of what was really happening in the classroom. Further, in the concluding remarks, the researchers end by stating that, “It is now very clear to us that a number of life-long programmes need to be carried out in order to improve teachers’ command of English” (p.37). This remark is rather contradictory because if the situation was really satisfactory, then the recommendation is redundant. But the issue is, is improving teachers’ command of English enough? Or should the training provide guidance as to how to integrate content and language for the teaching of these content disciplines? And who should train the teachers? Do we
have competent and pedagogically sound content-cum-language specialists with the right approach and strategies (to explain processes and detailed steps in English) to share with the teachers?

Nursherrina bte Basir Ahmad (2005) inquired into the ‘teaching strategies’ of teachers teaching Mathematics and Science in English based on the training attended at ETeMs and English language competencies of teaching preparation. In line with Brinton et al (1989) and Clegg (2003), strategies are defined as teaching practices, teacher’s preparation, materials development and learning features. The research found that teachers do prepare themselves by upgrading competence as well as preparing lessons before coming to class; preparing transcripts individually and through discussions with colleagues.

However, despite the training, Nursherrina bte Basi Ahmad (2005) reported that teachers suffer from lack of confidence in speaking to colleagues. This is of no surprise because the teachers believe that they are linguistically challenged. In terms of register, the teachers are not aware that science uses the language of observation characterized by identifying, describing, investigating and explaining, while mathematics uses logical connectors to explain similarity, contradictions, cause to effect and chronology or sequence. In other words, the study showed that teachers teaching Math and Science in English are neither adequately aware nor sensitive to the specialized language.

The issues above highlight the challenges faced in the training programme for the teachers, particularly those whose language competencies need to be worked on and who constitute the main players in instituting this change in medium of instruction for science and maths. Following on from this, it would be necessary for longitudinal research to be conducted to trace the background of these teachers who have undergone the training, the nature of attitudes they have in relation to the change in medium of instruction, the efforts they themselves have devoted to improve their language competency levels and then to examine the nature of the teaching that takes place in either the science or the maths classes. Only then can we know for sure where the specific on-going challenges lie with regards the change in medium of instruction and what needs to be done to work at ensuring a refinement of or an adjustment to the implementation.

Finally, in spite of all the attempts by the Ministry of Education, perhaps what is missing from the chain of causation for success is a recognition of the importance of the human factor. In a study conducted in a school in Sabah, Pang (2005) advocated the idea that to succeed, TeSME must get the
direct involvement of school principals, increased supply of resources to teachers to build up item banks and teaching modules and increased monitoring strategies from the Ministry. In short, for TeSME to succeed, the entire teaching profession must come as a whole and not as discrete parts waiting to be put together.

It has now been six years since the implementation of this policy and there has been mounting pressure from a number of quarters to revert to the old language policy of using Bahasa Malayu as MOI. There have been stronger voices opposing the policy change who have stated unequivocally that the policy change has disadvantaged the rural students tremendously. There has been a groundswell of bottom-up reaction from some members of society to the top-down policy. (Hassan, A. 2008; Concerned Mum, 2008; Gomez, J. 2008) At the same time, there are voices who say that it is too soon to abort the policy and that any change in language policy requires more time for the process of implementation before evaluation can take place. (Subramaniam, G, 2008; Very afraid Parent, 2008; Azimah Ibrahim, 2008, Sabanayagam, N. and Illi Liyana, M. 2008) Therefore, the country is presently at a linguistic crossroads in having to decide what to do with regards the medium of instruction for science and maths subjects.

It would be pertinent at this stage to remind ourselves of the change that took place in the post-independence period when English was replaced by Bahasa Malaysia as the medium of instruction. In a letter in the print media a teacher who has been involved in both phases of change wrote:

“Much has been said about this subject. All I have to add is that when the system was first changed from English to Bahasa Malaysia about 30 years ago the literary environment was only about 10-15% in Bahasa Malaysia. There were only about three Bahasa Malaysia advertisements over TV, one Malay movie per week, the daily news – warta berita, and limited choice of books, newspapers and magazines in bookshops.

Moreover, there were no financial incentives or anything provided by the Education Ministry to ease the teachers and students into the change. It was only after 30 years that we managed to achieve high proficiency in Bahasa Malaysia in the field of education.

Right now we are flooded with English books, cable television, movies, Internet etc. which will certainly help in achieving a high proficiency in English. The change to English from Bahasa Malaysia took place six years ago. In my opinion, it’s too early to make an assessment that may result in reverting to BM.

We need more time as the effort and money spent on various programmes by the MOE will only see results within the next five years. .... I can say that the progress made by teachers who are willing to change their teaching to English has been very good.

A few of them are slow and are not putting enough effort or the financial incentive to good use.
Let’s give teaching Science and Mathematics in English more time. (JU PPSMI, Ipoh in The Star, Friday 19 September 2008: N56) Good quote.

We believe that decisions on language policy are largely political in nature. The reality in most nations, is that the decision is based on the needs of the dominant ethnic group of the nation. As articulated by Rosnani Hashim above, the second reason for reverting to the old language policy of Bahasa Malayu as MOI is that “Bahasa Malaysia has been the language of democratization of higher education in this country, as our history has shown it acts as an equalizer. ... the Education Policy has helped narrow the gap between the rich and the poor and created a bigger base of middle class, which is a stabilizing factor in society. …”

We believe that though this is very true for that phase of the nation’s development but Hashim’s cry completely ignores the reality that this time around the change was being instituted because the dominant ethnic group was being disadvantaged by weak competencies in the English language. It must be realized that any major change from Bahasa Melayu (the national language and the mother language of the dominant ethnic group) would not have been instituted if the dominant ethnic group had not been in a position of disadvantage.

This dilemma facing the dominant ethnic group is articulated clearly by Lowe and Khattab (2003) when they say:

The success in having a national language resulted in the Malays – the race it was designed to help – being disadvantaged. The current policy, therefore, had to be substituted with one which, in fact, was directly opposed to the earlier policy. English now has to be propagated amongst a population schooled only in Malay and with a vested interest in its continued dominance. With English being used as a commercial world language, as well as functioning as a gateway to the ICT world, large segments of the Malay population which had been insulated from such world changes were being denied access to it. (p.219)

To understand the development of the disadvantaged position of the dominant ethnic group one needs to refer to the forces of globalization impacting on higher education. Since the 1990’s, the government planned to develop Malaysia into a regional centre of education. This was because of two factors: first, the Asian economic crisis and second, the need to increase the number of knowledge workers in order to meet with Malaysia’s aspirations to become and industrialized nation. (Gill, 2004: 140) While public universities have been doing an excellent job of contributing to the human resource
development of the nation, they will find it difficult to drastically increase the number of students without over-extending their existing services and facilities. This led to a consideration of encouraging the private industry to provide for tertiary education to meet with national human resource needs. Therefore in 1996, the Private Higher Educational Institutions Act (PHEIA) was passed by Parliament. This led to the liberalization and privatization of higher education to achieve the Government’s economic goals in higher education.

The liberalization of higher education enabled private institutions of higher learning to use English as medium of instruction for their various courses. This was a strong pull factor to enable the private sector to attract foreign students to Malaysia as well as provide Malaysian students, who might instead have gone abroad, with the opportunity to study in English in Malaysia. The business sector took this opportunity to set up colleges of higher education. This resulted in a bifurcation of higher education leading to public universities using Bahasa Melayu as medium of instruction and private universities using English as medium of instruction.

These complexities were further compounded by the issue of employment. With the bifurcation of higher education, large numbers of Malay graduates from public universities faced challenges in obtaining employment. Mustapha Mohamed, the then executive director of the government sponsored National Economic Action Council, articulates the reasons for this problem when he says: “This is basically a Malay problem .... It has to do with .... Their poor performances in, and command of, the English language” (Mustapa, 2002, pp. 1 & 2) This was because private sector employers looked for graduates who had English language competencies. Therefore this meant that graduates from private institutions of higher learning, who were mainly Chinese, were sought after as they were more confident and fluent in the English language. If this situation was allowed to progress with no change in language policy, the dominant ethnic group would have been impacted negatively and would have led to political and social instability in the nation (Gill, 2004).

Conclusion

Therefore what needs to be done? Malaysia is at linguistic crossroads and has to work out this dilemma in deciding what is best for the nation and its peoples to enable it to engage with the challenges of globalization and its aim of becoming an industrialized nation by 2020. Would it be
possible to give government schools the freedom of choice of the medium of instruction that they feel would be advantageous for them? After all, the government has liberalized the education system and there are private schools and international schools which use English as the medium of instruction. How does a nation decide on what is best for its people and for the long term development of the country – how does it balance between the needs of linguistic nationalism and that of development-oriented nationalism? Unfortunately there are no clear answers and we will have to wait to find out what the Ministry of Education decides. For now, these are the language policy dilemmas and challenges facing Malaysia.

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