

A NATION ON THE MOVE: FROM CHALKFACE TO LAPTOPS

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Abstract:

The change in the role of English in the Malaysian Language Policy has brought with it tremendous challenges. Extending the role of English from a subject taught in the school curriculum to a language operating as a medium of instruction for the teaching of science and mathematics (TESME) has necessitated the development of a nation wide teacher preparation and support programme.

The first part of the paper will describe the change in the policy. It will then go on to discuss the role of the Ministry of Education (MOE) in preparing the teachers to implement the language policy and examine the challenges that the MOE faced in implementing the Cabinet decision nationwide within a limited time frame. It will also describe the various initiatives that were launched by the different educational agencies to support the innovation. The paper will conclude by discussing some of the critical issues arising from such a major innovation in the Malaysian educational context.

INTRODUCTION

On June 6th, 2002, a dramatic shift in the Malaysian Educational Policy was announced.

The Minister of Education, informed the public that from January 2003, Mathematics and Science will be taught in English in Year One (Primary Year One), Form One (Secondary Year One) and Lower Six (A-Levels Year One) in all fully aided government schools. The rationale for this decision was based on several factors. Firstly, most science-based courses in the universities are highly dependent on reference materials that are published in the English language. Hence it was felt that it was expedient that these subjects were taught in English in order to equip the students with the necessary knowledge and skills for accelerated access to and mastery of these fields of knowledge in order to compete effectively in the international arena (Ministry of Education 2002:2). Secondly, Malaysia being an export economy needed to engage efficiently in English in order to remain competitive. Thirdly, the emergences of a world driven by technology and the dominance of the English language on the World Wide Web have also contributed to this change in policy.

2. REACTIONS TO THE POLICY

This announcement sparked off a heated debate especially among the ethnic-based political parties as this policy had serious implications for the vernacular primary schools

namely Tamil and Mandarin medium schools as it meant a reduction in teaching contact time for students in the vernacular. While discussions were being held with the various groups, the government went ahead with its preparations to implement the policy in fully aided government schools. Vernacular schools were given the option to do the same or come out with alternative suggestions as to how the policy could be implemented. Tamil vernacular primary schools opted to implement the policy whilst the Mandarin vernacular schools chose a bilingual model. This paper will focus on the implementation of the policy in government aided schools by discussing the role of the various educational agencies under the Ministry of Education (MOE).

3. CHALLENGES

As the policy was to be implemented nation-wide, it was imperative that necessary infrastructure be emplaced to enable teachers to be ready to implement this change. These pre-requisites ranged from the necessary technology to the availability of educational resources of a mathematics and science in English. The Ministry of Education set up 14 working committees to implement the Cabinet decision. These represented the following areas of concern:

1. Curriculum
2. Textbooks

3. Teacher training
4. Teaching resources
5. Supplementary resources
6. Information and communication technology
7. Publicity
8. Monitoring
9. Assessment
10. Special education
11. Technical studies
12. Matriculation programmes
13. Promoting English language use
14. Special funding for schools

The task of re-training teachers for this language conversion exercise was assigned to the Teacher Education Division of the Ministry of Education. The English Language Teaching Centre Malaysia (ELTCM), a teacher training college specialising in in-service teacher development, was appointed to develop a national re-training programme for teachers with the aim of enhancing the English language proficiency of mathematics and science teachers.

3.1. Teacher Concerns

ELTCM was thus confronted with this mammoth task of planning a nationwide re-training programme. Planners had to grapple with the reality that, “It is impossible to create a single, centrally administered and planned programme of professional development that will meet everyone’s needs and desires” (Clark 1992:75). However, despite this awareness, the challenge for ELTCM was just that, which was to develop one national level programme that could cater for all.

To add to this challenge, the teachers involved had varying levels of English language competency. This was largely attributed to the reduction in exposure to English as a consequence of the National Language Policy of the 1970s. This policy stipulated Bahasa Melayu as the official language and the medium of instruction in education beginning from the primary right up to the tertiary level. English, from being the medium of instruction was relegated to a second language, a subject that was compulsory to take but not to pass (Gill 2004). By 1982, Bahasa Melayu had replaced English as the medium of instruction for all fully-aided government schools and universities in the country. Teachers who graduated from the local universities and colleges before 1982 are generally more competent in the English language and this group represents the older and more experienced teachers.

Teachers educated in Bahasa Melayu in comparison often displayed inadequate proficiency in English for content delivery in the classroom.

The absence of a reliable database to determine the existing English language competency of teachers involved meant that planning a re-training programme had to be based on a set of broad assumptions.

3.2 School based Concerns

Schools were equally concerned about the impact of the policy on teaching and learning.

Most of the teaching materials used in the classroom were in Bahasa Melayu. Further, school library resources over the past twenty years had focused on accumulating mathematics and science reference collections that were in Bahasa Melayu. The books that were in English were mostly fiction or outdated encyclopedias and references in English.

How were schools going to update their resources?

In secondary schools concern was raised with regard to the incoming Form One students, who had six years of studying Mathematics and Science in Bahasa Malaysia. Would they be able to cope with the switch? The issue of examinations was another pressing concern.

Would students who studied mathematics and science in Bahasa Melayu, at the primary

level be able to cope with the switch in the medium of instruction? How would this affect their performance in the public examination?

The other question that faced most schools, parents and students is what happens in the “twilight years” i.e. students who are in Forms Two, Three, Four and Five since 2003. These students will be taught Mathematics and Science subjects in English once they reach Form Six or Matriculation. So does it make sense that they continue studying in Bahasa Melayu, when eventually they will have to undergo a change in the medium of instruction at pre-university and university? How would they be disadvantaged?

School administrators were equally concerned about the proficiency level in English of teachers who were involved in the change in medium of instruction. Would these teachers be able to cope with the switch?

4. SOLUTIONS

The fourteen committees that were set up were entrusted with coming out with solutions to address the concerns raised. Different divisions of the MOE were co-opted and assigned specific programmes which would help in the implementation of the policy.

4.1. English for Teaching Mathematics and Science (ETeMS)

The national re-training programme for mathematics and science teachers was developed along the model of English for Specific Purposes (ESP). ESP is often described as lacking in an underlying theory with its emphasis being on practical outcomes. Dudley-Evans and St John (1998:1) however argue that “the theory of ESP could be outlined based on either the specific nature of the texts that learners require knowledge of, or on the basis of the needs related nature of the teaching” . Such a programme would therefore involve needs analysis, text analysis, and preparing participants to communicate effectively in their work or educational context. The Malaysian re-training programme reflects this. The re-training programme is designed to meet specific needs of mathematics and science teachers, it is related in content to mathematics and science disciplines, and it is centred on language and skills appropriate for teaching mathematics and science in English.

The immediacy of the implementation of the policy meant that within a period of six months (June – December 2002), teachers had to be prepared nationwide to start teaching mathematics and science in English by January 2003. Within this time frame it was impossible to run needs analysis nationwide to determine teacher needs. Planners decided to work with a set of assumptions about teacher proficiency levels and professional needs. These broad assumptions were as follows:

- All mathematics and science teachers would need some form of re-training to enable them to teach in English.
- All teachers would have some basic English, for they would have undergone 11 years of exposure to the language as a subject while in school.
- All teachers would have had to read references in English in their pursuit of higher education.
- All teachers would come with different levels of qualifications and experiences in teaching.

These assumptions though not tested nationwide, were tested against a needs analysis sampling of schools in the state of Selangor and the capital city of Kuala Lumpur.

The initial findings showed a definite disparity in qualifications between teachers and a genuine concern about their lack of competence to teach these subjects in English.

The training programme developed by ELTCM is known as English for Teaching Mathematics and Science (ETeMS). Planners therefore had to take into consideration the range of challenges teachers would meet in the changing classroom. 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.

Hence the aim of the programme is two-fold:

- To enhance the English language skills of mathematics and science teachers in order to teach effectively using English as a medium of instruction
- To enhance teachers' continuing professional development

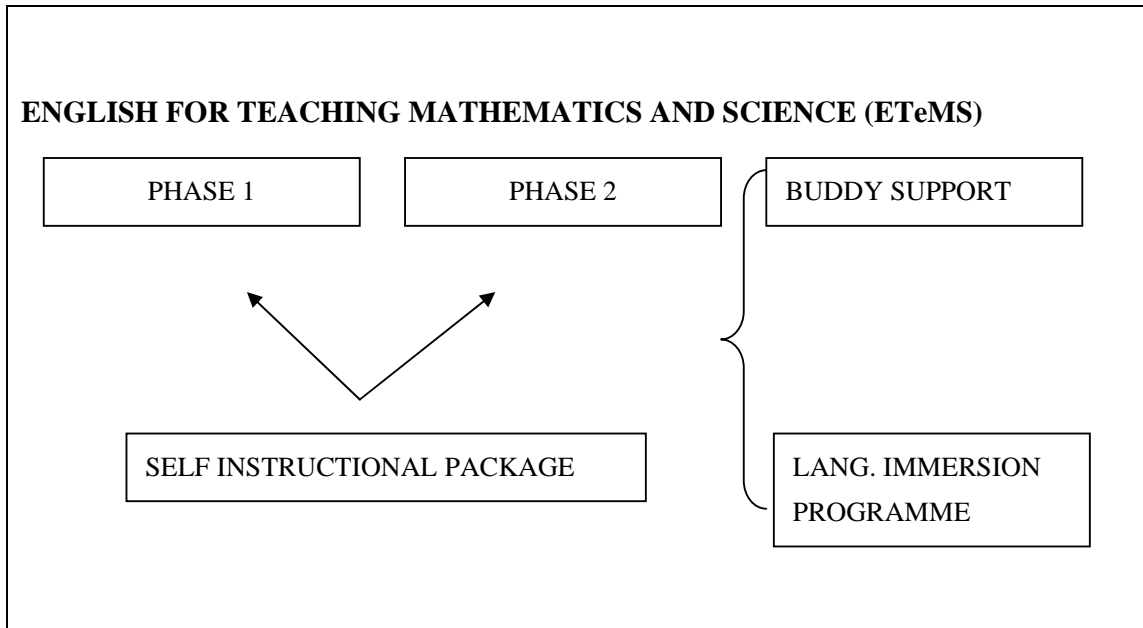
Among the competencies that were to be developed in the ETeMS training programme are:

- Language for accessing information
- Language for teaching mathematics and science
- Language for professional exchange

The fundamental design of the programme is as follows:

- 30% of the training programme will focus on enhancing teachers' language skills to access information in English.
- 70% of the training programme will focus on enhancing teachers' language skills for the classroom to teach mathematics/science in English.

Figure 1: Structure of the ETeMS Programme



The programme is implemented in two phases (see Figure 1). Phase 1 focuses on language for content mastery and Phase 2 on language for content delivery. The model of training is one that incorporates a long term programme comprising a variety of modes to enable teachers to make the switch in medium more efficiently. These modes include on-site face to face interactions which are day sessions, off-site 5-day language immersion stint and a self-study using a prescribed self-instructional language proficiency package.

Teachers whose proficiency is inadequate to meet classroom needs are identified by state English Language Officers (ELO) and trainers during the Phase 1 training. These teachers are required to attend an additional language immersion topping up course (LIP). In

addition, every school has appointed a school based language consultant (Buddy Support) who is an English language teacher to help their Mathematics and Science counterparts with their professional language needs.

Each phase comprises 120 hours. Out of these, 60 hours is made up of face-to-face interaction, 30 hours immersion and 30 hours of self-directed language practice using a self-instructional kit. The two phase structure is shown in the table below:

Table 1: ETeMS Training Model

Phase 1	Time	Content
(120 hrs)	60 hrs	<ul style="list-style-type: none"> • 5 modules spread over 5 weeks. Each module requires 2 days of face-to-face interaction (5 modules x 12 hrs = 60 hours) • a 5-day Module as an immersion course (5 days x 6 hrs = 30 hours) • a self-instructional package (teacher managed personal study = 30 hrs)
	30 hrs	
	30 hrs	
Phase 2 (120 hrs)	90 hrs	<ul style="list-style-type: none"> • 3 modules (Alpha, Beta and Gamma) Each module requires 5 days of face-to-face interaction and must be delivered in the given order: Alpha, Beta and Gamma (3 modules x 30hrs = 90 hours). • The Beta or Gamma Module could be delivered as in immersion course. • a self-instructional package (teacher managed personal study = 30 hours)
	30 hrs	

4.1.1 Module design and content

The content of the training modules are embedded in the context of mathematics and science disciplines. Dudley- Evans and St John(1998) define the role of the actual content in ESP using the notions of “carrier content” and “real content”. Materials drawn from school textbooks and other related educational publications are the “carrier content” used as a vehicle for the “real content” of the input that is language and skills. For example, the text and visual on the water cycle used in Module 2 (Phase 1) is the carrier content to teach the real content that is the language of process i.e. grammatical forms and functions that are used to describe processes. All texts selected represent materials teachers would encounter in both disciplines. However, some additional materials were included to give teachers practice with texts that were more discursive and narrative to enhance extensive reading skills. These included stories and articles from magazines.

The content for the two phases are summarized in the table below:

Table 2: ETeMS Programme Structure

Phase 1 Modules	Phase 2 Modules
Language for content mastery <ul style="list-style-type: none">• Text-processing skills• Subject specific to language forms• Grammar• Extensive reading skills• Oral skills• Scripting lessons in English	Language for content delivery <ul style="list-style-type: none">• Developing teaching materials in English• Writing tests in English• Vocabulary• Grammar• Exploiting courseware• Pronunciation skills• Classroom presentation skills

All the 5 modules for Phase 1 are made up of four sessions with specific components as shown in the table below:

Table 3: ETeMS Module Design

SESSION	COMPONENTS
Text Lab	Interfacing with text Word explorer Connecting with text Language in action Springboard
Language Lab	Grammar works Getting it right Trying it out
Stand and Deliver	Micro teaching
Back to the Future	Action plan

In Phase 2, three of the modules focus on language for content delivery. Each module comprises related content areas for the different sessions as shown in the table below:

Table 4: Phase 2 Module Content

MODULE	SESSIONS
Alpha Module	Teacher portfolio Note taking 1 & 2 Grammar 1, 2 & 3 Word builder Task design 1, 2 & 3
Beta Module	Trawling courseware 1 & 2 Evaluating digital courseware Courseware integration 1 & 2 Operating multimedia Digital teaching Assessment 1 & 2
Gamma Module	Teacher talk 1, 2, 3 & 4 Say it 1 & 2 Team teaching Oral presentation

4.2. Support Programmes

Apart from the face to face training sessions, the ETeMS structure also integrates ongoing language support elements, namely, a set of instructional language materials, a teacher support system and a programme for teachers with low language proficiency.

4.2.1 Self-instructional package

There was no expectation that such a training programme would bring about an immediate improvement in the level of language competency among all the teachers. To help teachers enhance their competency through self-paced learning it was felt that teachers needed additional self-instructional materials.

Teachers were supplied with a set of self-help materials. These included a Dyn-Ed International Language Courseware and a compilation of language learning websites supplied by Kries Education Consortium. These are both self-instructional language programmes for enhancing basic language skills. The inclusion of the CD-Rom was a critical factor as teachers had been supplied with laptops and the MOE wanted teachers to work with the latest technology. In addition the use of English standards that were internationally recognisable was another reason for the choice. Teachers were also supplied with English language reference books like the *Longman Essential Activator* (Pearson

1997), the *Longman Dictionary of Contemporary English* (Pearson 2001) as well as *Fundamentals of English Grammar* by Azar and Azar (Prentice-Hall 1992) to facilitate their own learning.

4. 2.2 Buddy Support Programme

Recognising the need for continuous teacher support at school level, the Buddy Support Programme was introduced to scaffold the transition needs of the mathematics and science teachers. An English teacher or a mathematics and science teacher who was competent in English was appointed to act as a “Critical Friend” (CF) to science and mathematics teachers in school. A ratio of one CF to two or three teachers (buddies) was proposed. The CF and the Buddies would meet on a regular basis and issues involving the use of English would be discussed during these encounters. It was hoped that these encounters would provide another avenue of support for teachers who needed more accessible support.

A course to train CFs in helping skills was developed in 2003 and CFs are being trained in stages. Although not all CFs have attended the course, the MOE monitoring visits have shown that this programme has taken off in various formal and informal forms since the introduction of the concept.

4.2.3 Language Immersion Programme (LIP)

The post-test scores of phase one of ETeMS training programmes indicated that there was a small percentage of teachers who achieved relatively low scores. It was felt that these teachers could benefit from additional English language exposure. A Language Immersion Programme (LIP) was developed for teachers to enhance their competency in English.

The course focused on forms and functions commonly used in the classroom. Using a thematic approach, activities and strategies were designed to provide practice in a non-threatening manner through structured training programme. At the same time the course also sought to enhance teachers' use of the self instructional language package that had been given.

4.3 School Support System

Apart from setting up a national re-training programme, the MOE also launched a number of initiatives to develop curriculum support systems in English to aid teachers. This involved various divisions within the MOE, namely, the National Curriculum Development Centre and the National Textbook Division.

4.3.1 Resources

The MOE decided that teaching and learning in the classroom would be supported by the use of ICT. In the national budget for 2003, the Prime Minister announced that RM 5 billion would be allocated between 2002-2008, for the implementation of the policy to teach Mathematics and Science in English. All teachers from national schools teaching these two subjects and English would be given a laptop computer to use. All Standard One, Form One and Lower Six classes will be equipped with a LCD projector, a screen and a trolley with speakers and an UPS system. Further, each school is given a launching grant of RM \$5,000 to \$15,000 to acquire additional reference resources and materials. This represented a massive investment of resources by the Malaysian government and helped “kick start” the use of ICT technology in the classroom

4.3.2 Curriculum

The curriculum for mathematics and science had been reviewed in 2000 and it had been implemented in Bahasa Melayu in 2002 in Year One of Primary and Year One of Secondary. With the change in medium of instruction the officers of the Mathematics and Science Unit of the Curriculum Development Centre (CDC) translated the curriculum into English. CDC also contacted vendors to design and supply teaching courseware in English to facilitate the teaching of these subjects in English.

4.3.3 Textbooks

The textbook division set up a committee to oversee the translation and adaptation of textbooks for the subjects. Publishers were contracted to translate and submit translations of the textbooks in phases to a panel of language experts. The panel vetted the translations and gave the translator suggestions on improvements. Vendors were also asked to design support courseware which could be used in together with the textbook.

4.1.4 Students in the “twilight zone”

To address concerns of parents who felt that their children would be disadvantaged, the examination paper would be offered in two languages that is Bahasa Melayu and English. Students could choose to take the examinations in English or Bahasa Melayu. Further according to Curriculum Circular 11/2002 issued by the MOE, schools were encouraged to teach mathematics and science in English in all other levels if they have the resources and capabilities. This then raises other questions as to how schools make their decisions.

5. ISSUES AND QUESTIONS

Any change in language policy will trigger related needs and challenges for the education system. This paper examines selected issues namely teacher identity reconstruction, maintaining a supportive school environment, allocating time for the re-

training of teachers, learner readiness and the emerging divisions within the national school systems.

5.1 Teacher Identity Reconstruction

Teachers are required to undergo major identity reconstruction over a very short period of time. The teacher of mathematics and science is required to be competent in the English language as well as to be savvy in the use of ICT in the classroom. The re-training programme at best sets teachers on this path but it cannot reconstruct teacher identity overnight.

Change is both an individual and an organizational process. Successful teacher identity reconstruction involves the two. According to Guskey (1995:121), “The key is to find the optimal mix of individual and organizational processes that will contribute to success in a particular context”. Individual initiative and motivation on the part of the teacher and the appropriate supportive organizational structures of the individual schools are two critical factors needed to facilitate this type of teacher identity reconstruction.

The English language teachers also found themselves reconstructing their roles and identity in the school context. Besides playing the role of course facilitators in the ETeMS

course, English teachers found themselves playing a role in the professional development of their colleagues. Instead of teaching children or teenagers, they were now dealing with adult learners in multiple roles of resource person, language expert and supportive colleague. It also entailed working across disciplines, which seldom happens in a professional context in Malaysian schools.

5.2 Supportive School Environment

Feeling isolated and detached can add to the discomfort that accompanies change. It is imperative that all aspects of a professional development programme be fashioned to involve teams of individuals working together (Guskey 1995). Planning, implementation and follow-up activities must not be seen in isolation. There must be collaboration and joint effort between the parties involved. There must be provision for those with diverse interests and responsibilities to offer their output and advice. While the teacher concerned may be localized within a school context, apart from the 'critical friend', the school principal, the inspectorate, the parent-teacher association and both the English Language Officer and the Mathematics and Science Officer can play a continuing supportive role. The school principal needs to play a pivotal role in encouraging these various parties to form a supportive environment. This supportive environment can only be created if Heads are made aware of the implications of ETeMS and the critical roles they play.

From the monitoring visits made by ELTCM, it has been noted that head teachers are not fully aware of the critical roles they play. This issue of preparation of head teachers to play key curriculum roles has not been addressed by the MOE. This was because the MOE had a very short time span to implement the policy and the priority was on getting teachers and materials prepared so that the innovation could be implemented in January 2003. However, this issue needs to be quickly addressed if the innovation is to take root.

5.3 Time for Re-training of Teachers

In the implementation of any innovation, the logistics of how the re-training of teachers is to be done is often calculated in monetary terms but seldom seen as how the movement of personnel for re-training impacts the school system. Further, a system that does not have a pool of qualified teachers to draw on as substitute teachers for short term assignments means a high rate of teacher absenteeism in the schools whilst the re-training takes place.

Re-training not only costs money but time. How can time be found without taking the teacher away from the classroom and impinging on the teacher's personal time and rightful holidays? The year 2003 has seen complaints from parents and head teachers about teachers attending courses and thus seemingly abandoning their duties in the classroom. As

a result, new solutions to this problem had to be found. Some states have spread the training over two days a week, i.e., Fridays and Saturdays, and part of the school holidays so that the teacher is present in school for most of the week. While this seems to address part of the problems the situation is further compounded with public examinations to be run and papers to be marked by the same teachers beginning from November. In addition the immersion modules require a 5 day stint. Can a satisfactory solution be found?

5.4 Learner Readiness

Curriculum innovation tends to be introduced using an instrumental model of implementation where the innovation is likely to be perceived as a new commodity to be dispensed by the teachers and consumed by pupils (Aoki 1984). Hence training and support structures generally tend to focus on the teacher and curricular support systems in order for the innovation to take off. Learner preparation often given a back seat in the overall programme or at even at times completely overlooked. It has often been the responsibility of the individual school to help learners make the transition and often there are no formalized systems to support the learner's transition. "Pupils are guardians of the existing culture and as such represent a powerful conservative force, and unless we give attention to the problems pupils face, we may be overlooking a significant feature of the innovation process (Rudduck 1991:57).

Learners can react in various ways. Of critical concern would be “the silent resistance” syndrome where the learner undermines the innovation by turning passive in the classroom. This phenomenon has been observed and documented by teachers in the current innovation. According to some teachers, classes which were once made up of active learners are now actually exhibiting silent resistance by non-participation. Teachers find this disconcerting and are now inquiring about ways in which learner preparation could be incorporated into the school system.

5.5 Emerging divisions within the national school systems

As the innovation moves up the fully aided government secondary school, some implications cannot be ignored. Within the school culture new distinctions are going to emerge. In the upper secondary levels, students in the Science stream will be studying six out of nine subjects in English whereas their counterparts in the Arts/Humanities stream would only be studying three out of nine subjects using English as the medium of instruction. As competence in handling information in English would give individuals a head start educationally and economically, this seeming divide raises concerns. In time to come, would a student from the science stream be better equipped to compete in the work force than his counterpart in the Arts/Humanities stream?

6. CONCLUSION

Even as this paper is written the challenges are still being addressed. This paper is just one attempt to document the innovation and to raise pertinent questions in our quest to clarify issues.

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