

**International Conference at Prince of Songkla University (Pattani) on 3 July
2010)**

Perception of the Headmaster towards the Implementation of the Policy: English for Teaching Mathematics and Science

Naruemon Da-I¹, Suhailah Hussien², Mohamad Johdi Salleh³

1. Master student, Institute of Education, International Islamic University Malaysia

2. Assistant Professor, Institute of Education, International Islamic University Malaysia, Malaysia

3. Assistant Professor Institute of Education, International Islamic University Malaysia, Malaysia

E-mail: naruemon_7890@hotmail.com

ABSTRACT

The main purpose of this study is to examine the perceptions of selected primary school headmasters regarding the implementation of English Teaching for Mathematics and Science (ETeMS). The study was conducted on seventy nine selected primary schools in Malaysia. The study employed the quantitative method used a set of questionnaire and in-depth survey questions. Statistical analysis included descriptive approach, frequency and percentage. The questionnaire was distributed by post to 79 headmasters from selected primary schools including the National Primary Schools (Sekolah Kebangsaan), National-type Primary Chinese School (Sekolah Jenis Kebangsaan China), National-type Primary Tamil School (Sekolah Jenis Kebangsaan Tamil), and the government-aided school of the missionary schools. Findings of the study showed that most of the headmasters supported ETeMS, but they faced some problems and challenges in the implementation of ETeMS, particularly when most of the Mathematics and Science teachers and also the students were not proficient in English.

Keywords: English for teaching Mathematics and Science, Headmaster, Role, Management style

ทัศนคติของอาจารย์ใหญ่ที่มีต่อนโยบายการเรียนการสอนวิชาคณิตศาสตร์และ วิทยาศาสตร์โดยใช้ภาษาอังกฤษ (ETEMS) ไปปฏิบัติ ในประเทศมาเลเซีย

นฤมล ดาอี¹, ซูไฮลาห์ ซูซัยน์², และมุฮัมมัด โจฮาดี ซัลและห์³

¹ นักศึกษาปริญญาโท สาขาบริหารการศึกษา คณะศึกษาศาสตร์ มหาวิทยาลัยอิสลามนานาชาติมาเลเซีย

E-mail: naruemon_7890@hotmail.com

² ผู้ช่วยศาสตราจารย์ คณะศึกษาศาสตร์ มหาวิทยาลัยอิสลามนานาชาติมาเลเซีย

³ ผู้ช่วยศาสตราจารย์ คณะศึกษาศาสตร์ มหาวิทยาลัยอิสลามนานาชาติมาเลเซีย

บทคัดย่อ

การวิจัยเรื่องนี้ มีวัตถุประสงค์เพื่อศึกษาทัศนคติของอาจารย์ใหญ่ในโรงเรียนระดับประถมศึกษาที่มีต่อนโยบายการเรียนการสอนวิชาคณิตศาสตร์และวิทยาศาสตร์โดยใช้ภาษาอังกฤษที่นำเข้ามาใช้ในโรงเรียนกลุ่มตัวอย่าง ซึ่งประกอบไปด้วยอาจารย์ใหญ่จากโรงเรียนประถมศึกษาในประเทศมาเลเซีย จำนวน 79 คน เป็นการศึกษาในเชิงปริมาณ โดยใช้แบบสอบถามและเป็นคำถามเชิงลึก เก็บรวบรวมและวิเคราะห์ข้อมูลทางสถิติโดยการหาค่าเฉลี่ยและร้อยละ โดยแบบสอบถามได้ถูกส่งผ่านทางไปรษณีย์ให้กับกลุ่มโรงเรียนตัวอย่างจำนวน 79 โรงเรียนประถมศึกษาในประเทศมาเลเซีย ซึ่งประกอบไปด้วยโรงเรียนประถมศึกษาแห่งชาติ 4 ประเภท ได้แก่ โรงเรียนประถมศึกษาทั่วไป โรงเรียนจีน โรงเรียนอินเดีย และโรงเรียนคริสต์ ผลการวิเคราะห์โดยรวมชี้ให้เห็นว่าอาจารย์ใหญ่กลุ่มนี้สนับสนุนและได้ตอบรับการนำนโยบายนี้มาประยุกต์ใช้อย่างครบถ้วนสมบูรณ์ แต่อย่างไรก็ตามโรงเรียนเหล่านี้ยังคงประสบปัญหาและความท้าทายในการนำนโยบายการเรียนการสอนวิชาคณิตศาสตร์และวิทยาศาสตร์โดยใช้ภาษาอังกฤษเข้ามาใช้ในโรงเรียน โดยเฉพาะอย่างยิ่งปัญหาที่พบก็คือครูที่สอนวิชาคณิตศาสตร์และวิทยาศาสตร์รวมทั้งนักเรียนไม่มีความชำนาญในการใช้ภาษาอังกฤษ

คำสำคัญ นโยบายการเรียนการสอนวิชาคณิตศาสตร์และวิทยาศาสตร์โดยใช้ภาษาอังกฤษ, อาจารย์ใหญ่,
บทบาทและหน้าที่, รูปแบบการจัดการ

INTRODUCTION

A school leader plays an important role in ensuring the success of a policy or school reform. Any new policy or directives from the Ministry of Education can be made possible if the school leader work hard at realizing the targeted goals. Headmasters play many roles in school and the way they handle certain situations in school are dependent on their style of management. The overall method of leadership used by a manager or in this context the headmaster would be their management styles. Effective headmasters know when to use the right management style depending on their people's skill, knowledge, and available resources. In other words, they would select a management style that works best for any given situations without specific style geared to specific set of condition. According to Polite and Mary (1994), the purpose of any management style would be to motivate teachers to produce their best work performances.

According to Douglas McGregor (1960) a successful management style largely depended on the headmasters' own personality, and their training to realize a range of ways of working with people, especially the teachers. It should be remembered that the particular style of management affected the school's tone either adversely or positively. Headmasters are at the forefront for implementing policies that promote thorough teaching and learning. Consequently, headmasters should play a critical and determining role in achieving the central purpose of the school.

The management styles of headmasters in their respective schools vary accordingly based on certain criteria that intertwined with their own personality and leadership styles. Mittler (2002) opined that, style is not the critical variable to success but the quality of the headmasters and the implementation of their leadership styles appropriate for the school at that particular time in its life cycle that makes the difference. In addition, Mittler (2002) emphasized on accountability management where each individual's expected job outcomes established the expectation and the actions that the individual will take, consistent with corporate morals and values, which are necessary to achieve accountabilities.

BACKGROUND OF THE STUDY

The Star, (2009) reported that ETeMS or English for Teaching Mathematics and Science was proposed in 2002, and immediately implemented in 2003 by the Ministry of Education, Malaysia. Lim and

Mah (2007) mentioned that many concerns have been raised regarding its effectiveness in improving English language and its impact on students' learning and understanding of scientific and mathematical concepts. Policy to change the medium of instruction in the teaching of Mathematics and Science from Bahasa Melayu to English is an important innovation affecting teachers of Mathematics and Science generally. Since, many concerns and issues have been raised with regards to its relevance, practices, effectiveness and success (Kam Foong, 2003). Many researches in other countries have shown that teachers teaching Mathematics and Science in a second language faced many problems (Jongsma and Jongsma, 2005).

Similarly, a number of researches conducted in Malaysia have indicated some problems and challenges in implementing ETeMS (Noraini *et. al.*, 2006). One of the challenges is the inability of the Limited English proficiency (LEP) students to follow lessons in a different language. This had become one of the main reasons that the public called for a review of the ETeMS policy and the suggestion to revert the teaching of Mathematics and Science to Malay language. Rather than succumbing to these suggestions without proper consideration and research, it is timely that a study is conducted to examine and understand the implementation of ETeMS in primary schools. The school or rather the school authority is responsible in the success of the implementation of any policy and directives from the Ministry of Education.

PURPOSE OF THE STUDY

There is a need to understand to what extent ETeMS is being implemented, how it is implemented, what problems and challenges are being faced in its implementation, and how they are managed in schools. As stated by Pillay (2003), little research had been done in exploring the headmaster' views and experiences of ETeMS, thus, the study aims to explore and understand how the schools in general and the headmaster/mistress in particular, implement ETeMS and manage its problems and challenges. It is hoped that the study would be able to inform the Ministry of Education the extent of the implementation of ETeMS and whether the purpose of ETeMS in schools can be realized.

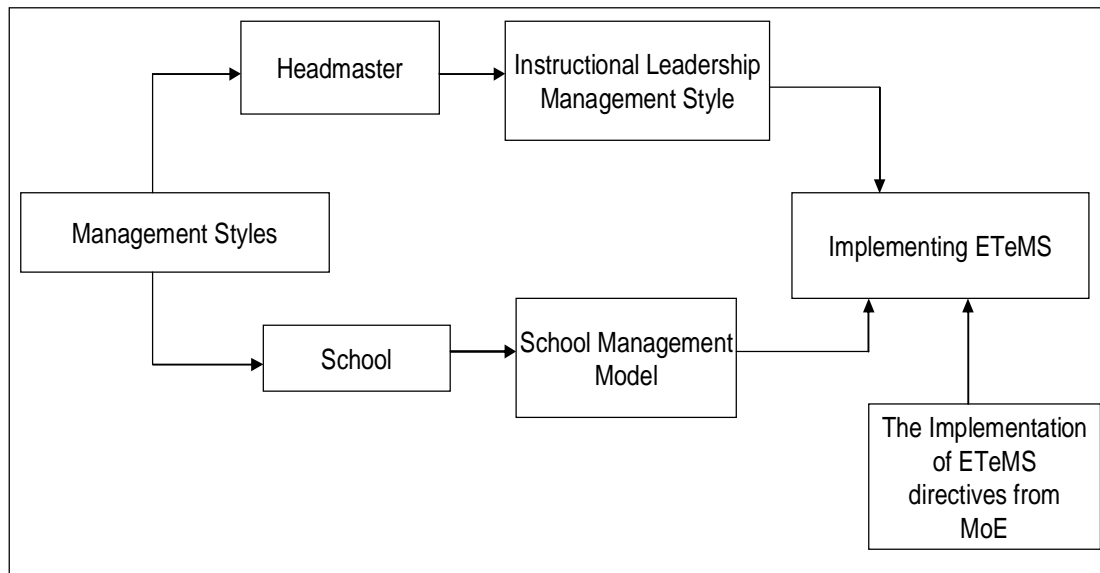
RESEARCH QUESTIONS

In this study, the researchers identified three main research questions:

1. What are the roles of the headmasters in implementing ETeMS in primary schools?
2. What are the problems and challenges of ETeMS that the schools faced?
3. How are the ETeMS' problems and challenges in schools managed and resolved?

CONCEPTUAL FRAMEWORK OF THE STUDY

The conceptual framework of perception of the headmaster towards the implementation of the policy regarding to English teaching for Mathematics and Science



The conceptual framework of this study shows the management style of the selected headmasters from the several selected schools in Malaysia who are implementing ETeMS policy as it is directed from Ministry of Education, many of these headmasters were selected from IIUM as the respondent of the study. Headmasters play their instructional leadership roles in ensuring and carry out their school responsibilities in implementing ETeMS policy in their schools. The school management models use in running of this ETeMS policy in their schools. Based on the management styles, the role that headmasters play in their schools and the way that they handle the ETeMS policy will depend on their styles of management.

METHODOLOGY

Research Design

This research is a case study which employed the survey method as the method of gathering data. This method used descriptive statistics in order to answer the questions addressed in this study. Since the researchers employ purposive sampling, the survey was assisted in selecting the participants based on whether they face any problems in implementing ETeMS and three specific criteria, which are, gender of school authority, type and location of schools. The study selected 6 participants to be involved in the in-depth survey questions. Thus, this research is relevant in gathering a large amount of data from the respondents in order to gain their experiences, ideas, beliefs, attitudes, and perceptions.

Population and Sample

This study was conducted at the Institute of Education where the participants for this study were selected based on the understanding that all the participants were available and agreed to respond to the questionnaires. They were the headmasters who underwent the B.Ed (Educational Management) Program at the Institute of Education, International Islamic University Malaysia. These headmasters were from different types of school namely, the National Primary School, the National-type Primary Chinese School and National-type Primary Tamil School as well as the government aided schools or the missionary schools. The respondents include both male and female headmasters comprising of Malay, Chinese and Indian. There were two cohorts of the headmasters; the first cohort consisted of 38 headmasters while the second cohort consisted of 41, thus the population of the study was 79 headmasters. However, the researchers only received 46 returned questionnaires from the both cohorts of headmasters.

Instrumentation

The instrument used for this study was a set of questionnaire that was sub-divided into three major sections. Section A gathers information about the participant's demographic data including their background. Section B deals with the headmasters' perceptions toward the implementation of ETeMS, lastly section C regarding in-depth survey questions asked respondents to provide comments and suggestions with regard to their opinions of ETeMS and the revert policy.

Data Collection Procedures

After all the necessary permission had been granted from the Director of Student Affairs Division, the researchers had made personal phone calls to all respondents before mailing and set out to sent questionnaires and the permission letters through the email and by post. A self-addressed stamped returned envelope was enclosed together in order to ensure that the respondents was able to return the

answered questionnaires. 3 weeks later, the return rate of the questionnaires was 58.23%, it was quite low probably because these respondents were too busy once they went back to school and did not have time to answer. Also, time was not right as they were so caught up with the final preparation for their students and the school.

Data Analysis

The raw data obtained was processed using the Statistical Package for the Social Science (SPSS) version 12.0 for windows. The questionnaire forms had been completed by the respondents then gathered and verified by the researchers. The researchers had employed the descriptive approach in analyzing the data involving the frequency count and percentage analysis. Frequency, percentages, and mean were used to analyze the items of Section B since it was descriptive in nature. Similarly, frequency and percentages were also employed to portray the profile of the demographic attributes of the respondents. Section C describes the recommendations and suggestions from the selected headmasters about the implementation of ETeMS in their respective schools.

RESULTS

Section A demonstrated the demographic characteristics information of the selected headmasters who were respondents to the survey, the total number of respondents, 46% are male headmasters and 54% are female. Upon categorization of age group, slightly more than half of the headmasters (59%) were over 50 years old, while 39% were between 46-50 years old and very few (2 %) were between 41-45 years old. For the respondent's race, slightly more than half of them (59%) were Malay, 26% of them were Chinese, and only 15% were Indian. With regards to the levels of education, a few of them (7%) had obtained a certificate, while 26% had obtained diploma, and more than half (67%) had obtained a degree. In relation to the teaching experience, a majority of them (96%) had more than 16 years while only very few (4%) had experience between 11 to 15 years. Furthermore, in terms of experience as headmasters, (15%) had more than 16 years of experience, followed by 35% of them who had 11 to 15 years, 44% of them had 6 to 10 years of experience, and the rest 7% had between 1 to 5 years of experience, In relation to the location of school, slightly more than half (52%) were located in the urban areas, while the rest (44%) of the schools were in the rural areas. Furthermore, 44% of the schools had students' population below 500 pupils. Meanwhile 33% of the schools had 501 to 1000 pupils, 7% of the schools had 1001 to 1500 pupils, and 17% had more than 1501 pupils. The categorization based on the types of schools was a majority (85%) were from the National Primary Schools (*Sekolah Kebangsaan*), while 16% of them were from the National-Type Schools.

Section B demonstrated on headmasters' perception toward the implementation of ETeMS policy as shows below.

Table 1: Role of Headmaster

Item	Item Focus	SD & D	N	SA & A
		% (n)	% (n)	% (n)
1.	I have discussion with teachers and students when they faced problems of ETeMS.	–	2 (1)	96 (44)
2.	I discuss with teachers about the ways on how to enhance students' achievement in ETeMS.	–	2 (1)	96 (44)
3.	I work together with teachers to ensure the ETeMS' objective is on the track with school mission	–	2 (1)	96 (44)
4.	I supervise and monitor the teachers teaching in ETeMS.	–	2 (1)	96 (44)
5.	I am the best model to the students and teachers in the implementation of ETeMS.	4 (2)	30 (14)	63 (29)

Table 1 shows that the majority (96%) of the headmasters strongly agreed that they discussed ways when they faced problems of ETeMS as in item 1, discussed with their teachers ways of enhancing students' achievements in ETeMS as in item 2, worked closely together with their teachers to ensure the objective of ETeMS is on the right track as the school's mission as in item3, supervised and monitored their ETeMS teachers as in item 4. Only 2% of the respondents in all these items remain non-committal in their response. This clearly showed that these selected headmasters fulfilled their roles and responsibilities in managing ETeMS in their respective schools. With regard to item 5, 63% strongly agreed that they are the best model to the students and teachers in the implementation of ETeMS, with

only 4% disagreed while 30% remained neutral. Here, the headmasters clearly played their role and take serious responsibility of their 'school'.

Table 2 exhibited that in item 1, more than half (70%) of the respondent viewed their teachers as not fluent in English, but 31% commented that their teachers were fluent in English, while 15% remained non-committal.

Table 2: Problems and Challenges faced by Teachers

Item	Item Focus	SD & D % (n)	N % (n)	SA & A % (n)
1.	My teachers are not fluent in English.	31 (6)	15 (7)	70 (32)
2.	My teachers have problems in explaining Mathematical and Scientific in English.	20 (9)	17 (8)	61 (28)
3.	My teachers need to give long explanation and translation for ETeMS, thus more time is needed.	15 (7)	15 (7)	67 (31)
4.	My teachers are not confident to teach Mathematic and Science in English.	24 (11)	15 (7)	59 (27)
5.	My teachers can teach better Mathematics and Science in their mother-tongues.	7 (3)	13 (6)	78 (36)

With regard to item 2, 61% of the respondents strongly agreed that their teachers had problems in explaining Mathematics and Science lessons in English, but 20% strongly opposed this view, while 17% remained non-committal. For item 3, 67% of the respondents strongly agreed that their teachers need to give many long explanation and translation for ETeMS. However, 15% of the respondents both strongly disagreed and remained neutral on this point. For item 4, 59% of the respondents strongly agreed that their teachers were not confident to teach Mathematics and Science in English whereas 24% of the respondents disagreed, while 15% remained silent on this point. For the last item, a majority (78%) of the respondents strongly agreed with item 5 pertaining to the fact that these teachers can teach better if they teach

Mathematics and Science in their mother-tongue. However, 13 % of the respondents remained neutral with a small number (7%) of respondents strongly disagreed with this view.

Table 3: problems and challenges faced by students

Item	Item Focus	SD & D	N	SA & A
		% (n)	% (n)	% (n)
1.	Students find difficulty to solve Mathematical and Scientific problems in English.	15 (7)	9 (4)	74 (34)
2.	Students cannot follow the lesson of ETeMS.	33 (15)	24 (11)	41 (19)
3.	Students are not fluent in English.	13 (6)	13 (6)	72 (33)
4.	Students are quiet and passive when learning Mathematics and Science in English.	28 (13)	9 (4)	61 (28)
5.	Students are not interested to learn Mathematics and Science in English.	39 (18)	37 (17)	22 (10)

Table 3 indicated Item 1 obtained the highest percentage as the main problem where 74% of the respondents were in agreement with the fact that students found it difficult to solve problems of Mathematics and Science in English, while only 15% of the respondents agreed that students could solve the problems of Mathematics and Science in English. With regard to item 2, 41% of the respondents strongly agreed that students were unable to follow the lesson of ETeMS, but almost an equal percentage of the respondents (33%) disagreed. On item 3, 72% of the respondents strongly agreed that their students were not fluent in English, while 13% disagreed.

For item 4, 61% of the respondents strongly agreed that their students were passive when learning ETeMS, but 28% disagreed, and only 9% remained non-committal. In item 5, where students were not interested to learn Mathematics and Science in English, 39% disagreed, 37% of the respondents felt

neutral about this statement, and only 22% strongly agreed. This indicates that there were more students who faced problems in learning ETeMS when 39% strongly disagreed that they were not interested to learn Mathematics and Science in English compared to 22% who strongly agreed.

Table 4: School Management

Item	Item Focus	SD & D	N	SA & A
		% (n)	% (n)	% (n)
1.	My school fully supports the implementation of ETeMS.	9 (4)	3 (6)	76 (35)
2.	My school is prepared to deal with any issues and problems of ETeMS.	7 (3)	15 (7)	76 (35)
3.	My school supports the continuation of ETeMS.	17 (8)	37 (17)	44 (20)
4.	The planning of professional development for ETeMS in my school takes into account of the needs and interests of individual teachers	15 (7)	15 (7)	67 (31)
5.	The objective and policies of ETeMS can be easily and clearly understood by teachers.	4 (2)	28 (13)	65 (30)

Table 4 shows that a majority (76%) of the respondents strongly agreed on item 1 where the school fully supports the implementation of ETeMS, while very few (9%) disagreed, and only 3% remained neutral. With regard to item 2, a majority (76%) of the respondents strongly agreed that the school were prepared to deal with any issues and problems of ETeMS, while 7% disagreed, and 15% was non-committal to this management problem by the school. Meanwhile, 67% of the respondents strongly agreed with item 4 that the planning of professional development in their school take into accounts the needs and interests of their teachers, while 15% of the respondents both disagreed as well as remained neutral on this fact. For item 5, 65% of the respondents strongly agreed that the objective and policies of ETeMS in the school can be easily and clearly understood by teacher, and only 4% strongly disagreed, while 28% remained non-committal. With regards to item 3, only 44% of the respondents agreed to the continuation of ETeMS, while 17% disagreed and 37% remained non-committal on this issue.

For section C, the headmasters shared their in-depth understanding about ETeMS. It was found out that according to the headmasters, ETeMS means teaching Mathematics and Science in English. As one of the headmasters said;

“ETeMS is a method of teaching two important subjects in English which are math and Science. The medium of teaching instruction in the classroom is in English. In correspondent with this, the education department has provided teachers with related and useful teaching materials CCD, text books activity books and teaching instruments CLCD projector for the progress of ETeMS.”

However, another headmaster claimed that using English does not enable students to understand the subjects taught better than using Malay language as he said;

“The objective of teaching Mathematics and Science is for students to gain and acquired knowledge. Using English as the medium of instruction does not help students to achieve these objectives.”

This is because according to another headmaster, low performance students still perform not good does not matter what language they are using. Besides, some headmasters also claimed that some students and teachers have difficulty in English compared to Bahasa Malaysia language and thus the teachers cannot deliver the subjects very well and also students are not able to understand the subjects that have been taught.

In contrast to that another headmaster sees the benefit of ETeMS by saying that;

“It is good for pupils. In future it will be very helpful for pupils to continue their studies for higher education.”

The other headmaster inline with this statement when he indicated that;

“It is a relevant system which enables and prepares students to acquire knowledge for the future especially in the internet world.”

Another headmaster also sees the advantage of ETeMS when he indicated that by using English in teaching Mathematics and Science also allows students to practice more English as some students do not have chance to practice it at home as they speak their native language at home. Thus, it allows students to improve their English language skills.

Thus, from the selected responses above it can be concluded that the headmasters understanding on ETeMS is about teaching Mathematics and Science by using English medium and bring some advantages and disadvantages. The advantages are that it improves English language skills among students, it prepares students for higher learning institution and it is suitable with contemporary trend such

as internet era. As for the disadvantage of ETeMS, it is revealed by the headmasters that it does not help low performance students and students who do not fluent in English in understanding the subjects.

DISCUSSION

Based on the findings of the study, the researchers were able to conclude that the majority of the headmasters agreed with the rationale behind the policy that it is necessary to prepare future generations to be proficient in English and competent in Mathematics and Science to meet the changing global conditions. The majority of these selected headmasters fully support the implementation of ETeMS policy. However, some headmasters apparently did not agree fully with the ETeMS policy because they argued that mastering Mathematics and Science concepts and skills were much more important than mastering English. They asserted that in order to teach well, teachers had to be very competent in the medium of instruction. Besides, many of the school Mathematics and Science teachers were still lacking in English language competency. Accordingly, it was found that these teachers tended to teach the subjects using two languages or bilingual. As a result, students became more confused with not only Mathematics and Science, but also the two languages. Headmasters viewed that the students were quiet and passive because they found it difficult to solve Mathematics and Science problems, and that they cannot follow the lessons very well.

As for the findings, the researchers conclude that teachers might not enjoy teaching in English, and may not be confident in teaching Mathematics and Science in English. It was found that these teachers were also not comfortable using English. This might be because the teachers were used to teaching in Bahasa Melayu for many years, so the recent changes in policies may do little to prepare them to make changes in their style of teaching. Thus, a majority of them were not happy and satisfied to teach both subjects in English. From the selected headmasters' point of view, it was obvious that the proficiency of English was the problem for the teacher to teach any subject in English.

Furthermore, the findings from the Ministry of Education (2009) found that only a small percentage of teachers fully used English to teach the two subjects. On average, the percentage of those using English during Mathematics and Science periods was around 53 to 58 per cent which indicated that only a small number of teachers were proficient. Therefore, the teaching and learning process cannot run smoothly due to the lack of language proficiency not only among the teachers, but also the students.

With regards to the students' performance, Table 4 showed that the a majority (74%) of the headmasters viewed that many students found it difficult to solve problems of Mathematics and Science in English, while 72% mentioned that the students were not fluent in English. The Ministry of Education's (2009) study, which was carried out by local universities found that students' mastery level of English during the entire policy was around 3 per cent while the level among rural students was low. This study also clearly demonstrated that the role of headmasters was very important to implement the policy.

CONCLUSION

The researchers were able to glimpse a number of teachers who lack the ability and qualifications to teach both the subjects of Mathematics and Science in English. The current Mathematics and Science teachers need further training to improve their proficiency in not only the language but the subject matter as well. If not, this action will only reduce the students' interest in Mathematics and Science as they cannot grasp the language and comprehend the subject. At the same time, students need to be fluent in the (English) language before learning any subject in that language. As the research findings revealed, many students are interested in learning Mathematics and Science in English but they lack the ability to learn Mathematics and Science in English. Furthermore, the research also indicated that many of the schools' headmasters are fully supportive of the implementation of ETeMS but the Ministry of Education policy can at times tied them from being creative and innovative. The principles of ETeMS policy are remarkably significant and if given the time to keep pace with the mental and emotional readiness of both the teachers and students will, in due time, be a vehicle for the production of a globally competitive Malaysians.

RECOMMENDATIONS

Future researches should be conducted using both quantitative and the qualitative methods so that in-depth understanding can be derived on the issue of ETeMS.

ACKNOWLEDGEMENT

The authors are very grateful for the comments and support from sister Wan Suraya Wan Nik, sister Wardah Guimba, sister Syimarmasni binti Md Arshad and brother Samsoo Sa-u. This study was funded by the Research Management Centre, International Islamic University Malaysia (IIUM) under the Research Endowment Fund (EDW B0805-154)

REFERENCES

- Choong, K.F. (2003). 'Teachers' lives and educational change.' *IPBA E-journal 2003*.
- Jongsma, K., and Jongsma, G. (2005). 'Teaching Science and Mathematics in English in Grade 1 and 2 Classrooms in the UAE.' *International Journal of Learning, 12 (5)*.
- Lim, S.K., and Mah, C.W. (2007). 'Language development strategies for the teaching of Science in English.' *Learning Science and Mathematics, 2, Nov, 47-60*.
- McGregor, Douglas (1960) *The Human Side of Enterprise*. New York: McGraw-Hill.
- Mittler, C. (2002). Job satisfaction and perception of motivation among middle and high school teachers. *American Secondary Education, 31(1)*, 43-53.
- Noraini Idris, Loh, S.C., Norjoharuddeen Mohd. Nor, Ahmad Zabidi Abdul Razak and Rahimi Md. Saad. (2006). 'The Professional Preparation of Malaysian Teachers in the Implementation of Teaching and Learning of Mathematics and Science in English.' *Eurasia Journal of Mathematics, Science & Technology Education, 2007, 3(2)*.
- Pillay, H. (2003). 'Winds of change: Teaching Science and Mathematics in English-A perspective from the school.' *IPBA E-Journal 2003*.
- Polite, M. Mary. (1994). Team negotiation and decision-making. *International Journal*
- The Ministry of Education (2009, 15 November). *The reverted policy back to mother-tongues*. The Star.