AN EVALUATION ON THE EFFECTIVENESS OF ENGLISH FOR TEACHING MATHEMATICS TRAINING PROGRAMME

by

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ABSTRAK

Program perkembangan profesional adalah satu wahana bagi pendidik meningkatkan pengetahuan profesional dan praktik mereka secara berterusan. Walau bagaimanapun, literatur pendidikan telah menunjukkan dapatan yang tidak konsisten dan respon yang berbagai berkaitan keberkesanan kursus *English for Teaching Mathematics and Science* (ETeMS). Kajian berkaitan latihan dalam perkhidmatan yang menyelidik ETeMS telah mendapati kursus tersebut tidak meningkatkan pengetahuan, kemahiran, dan keyakinan guru. Sehubungan dengan itu, kajian ini bertujuan untuk menilai keberkesanan kursus *English for Teaching Mathematics* ke atas tahap keyakinan, pengetahuan, dan kemahiran peserta kursus. Pendekatan kuantitatif dan kualitatif telah digunakan untuk tujuan pungutan data bagi kajian ini. Soal selidik tinjauan telah diedarkan kepada 372 peserta kursus *English for Teaching Mathematics* kohot 2006 di Kedah dan sebanyak 269 soal selidik yang lengkap telah dikembalikan dan digunakan dalam kajian ini. Data yang telah dikutip, dianalisis menggunakan statistik diskriptif. Satu ujian pra dan post telah dijalankan di salah sebuah pusat kursus untuk mendapatkan indek pembelajaran. Data tinjauan ini juga telah disahkan dengan menggunakan data dari temubual dan pemerhatian pengajaran mikro menggunakan sub-sampel peserta kursus (n = 15). Dapatan kuantitatif menunjukkan secara keseluruhannya kursus *English for*

Teaching Mathematics telah meningkatkan keyakinan, pengetahuan, dan kemahiran peserta ke tahap sederhana. Skor min bagi keyakinan mengajar isi kandungan dalam bahasa Inggeris ialah 3.60 dan keyakinan berinteraksi dalam bahasa Inggeris di dalam bilik darjah ialah 3.52. Skor min untuk pengetahuan menggunakan terminologi Matematik yang betul ialah 3.81, manakala skor min untuk penggunaan bahasa yang betul di dalam bilik darjah ialah 3.64. Skor min bagi menyediakan bahan pengajaran dan pembelajaran Matematik dalam bahasa Inggeris ialah 3.57; menyediakan soalan hanyalah 3.01; dan menggunakan soalan sedia ada ialah 3.47. Dapatan kajian juga menunjukkan 80.67% responden berminat untuk mempelajari Bahasa Inggeris lebih mendalam dan 70.81% responden berharap kursus tersebut dapat meningkatkan kecekapan bahasa Inggeris mereka supaya pengajaran mereka lebih berkesan. Secara keseluruhan, dapatan menunujukkan kursus ini menyediakan peluang terhad kepada responden untuk meningkatkan kefasihan bahasa Inggeris mereka. Kajian ini mencadangkan supaya analisis keperluan dibuat sebelum menjalankan aktiviti Latihan Dalam Perkhidmatan (LDP) di masa akan datang. Adalah penting juga untuk mengambilkira elemen pembelajaran dewasa apabila merancang aktiviti LDP. Pembangunan profesional yang berterusan, sokongan selepas LDP, dan pemantauan susulan juga dicadangkan untuk memastikan keberkesanan LDP.

AN EVALUATION ON THE EFFECTIVENESS OF ENGLISH FOR TEACHING MATHEMATICS TRAINING PROGRAMME

ABSTRACT

Professional development programme is a vehicle for educators to continually enhance their professional knowledge and practice. However, educational literatures indicated inconsistent findings and mixed response regarding the effectiveness of the course of English for Teaching Mathematics and Science (ETeMS). In particular, in-service training research investigating ETeMS denote that the course did not enhance teachers' knowledge, skills, and confidence. Thus, the purpose of this study was to evaluate the effectiveness of the course of English for Teaching Mathematics on participants' level of confidence, knowledge, and skills. A mixed method using both quantitative and qualitative approaches was utilized to collect data in the study. A survey using questionnaire was administered to 372 course participants of the English for Teaching Mathematics of cohort 2006 in Kedah and 269 complete questionnaires were returned and used in the study. The data collected were analysed using descriptive statistics. A pre- and post-test was administered at one of the course centres to tabulate the index of learning. The survey data were also validated through interviews and micro-teaching observation with a sub-sample of the course participants (n = 15). The quantitative results suggested that the course of English for Teaching Mathematics, overall, developed the respondents' confidence, knowledge, and skills at a moderate

level. The mean score for confidence to deliver content in English was 3.60 and confidence to manage classroom interaction in English was 3.52. The mean score for knowledge in using the correct Mathematics terminology was 3.81, while the mean score in using the correct classroom language was 3.64. The mean score for producing Mathematic teaching and learning materials in English was 3.57; formulating questions was only 3.01; and using ready-made questions was 3.47. Results from this present study also indicated that 80.67% of the respondents would like to learn more English and 70.81% of them hope the course will improve their English in order to make their teaching more effective. On the whole, the evidence suggests that the course provided limited opportunities for respondents to develop their English proficiency. The present study suggested that in future, needs analysis should be carried out before implementing In-service Training (INSET) activities. It is essential to take into consideration elements of adults learning when planning INSET activities. Continuous professional development, post-INSET support, and follow-up monitoring are also suggested in order to insure the effectiveness of INSET.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Education is part of the existence of a society. As such it is constantly subject to social pressures and political demands as to the type of education they feel is worthwhile at a particular time. Therefore, reform combines the call for academic excellence. As educational reforms occur, teachers will need to acquire new skills. Thus, the school has become a challenging environment in which to work. Teachers are faced with new and ever changing challenges which they have to address and respond.

Professional development is usually the most frequently recommended method for bringing about change. Teacher development deals with changes that teachers experience in job skills, knowledge, attitudes, concerns and beliefs (Bolam & McMahon, 2004). Teacher professional development is usually claimed to improve the learning outcomes for students by providing teachers with greater knowledge or skills which can be applied directly to their own practice (Hargreaves & Fullan, 1992).

Professional development activities provide teachers with opportunities to deepen their understanding of academic disciplines and pedagogical principles. Training focus on the acquisition of knowledge, skills, and attitudes needed to perform more effectively

in one's current job (Blanchard & Thacher, 2007). It is expected that students will benefit from these improvements. A study done on student outcomes after teachers had participated in staff development programmes showed positive attitude amongst students towards Mathematics, improved ability to solve problems, and increased conceptual understanding of Mathematics (Madson & Lanier, 1992). Similar findings were also reported in the study done by the Malaysian Ministry of Education (1998).

Teacher education is a complex endeavour oriented toward preparing professionals to teach effectively. This process is viewed as a continuum spanning pre-service, induction, and in-service experiences (Brown & Borko, 1992). Well-trained teaching professionals are important contributors to excellence in education. Today's teacher need a profound understanding of what they are doing, so that they can adapt familiar techniques intelligently and develop new techniques as circumstances change and new demands are made upon them. Therefore, quality professional development for teachers has never been more important than it is today as the challenges they face intensify and the expectations for quality education increase.

1.1.1 In-Service Training in Malaysia

In the beginning, in-service training in Malaysia was carried out as a mean to solve the pressing demand for trained teachers. To encounter the specific needs created by the frequent changes in curriculum, in-service courses were held during the school holidays and weekends. The courses were carried out in order to update teachers' knowledge and classroom technique.

The Ministry of Education felt that it is essential to improve and update the teachers' knowledge, skills and competencies in facing the changes that either occurred naturally or were imposed upon the teachers. The ministry believes that staff development is one of the ways to upgrade the teachers' knowledge, skills and competencies. The in-service training aims to enhance the teachers' knowledge and their teaching professionalism. At present, the aims of in-service training in Malaysia are:

i. to upgrade the academic and professional knowledge of teachers and to widen their experience in various subject disciplines;
ii. to orientate teachers towards new developments in teaching methods, techniques, and curricular programmes; and
iii. to enhance the commitment and motivation of tenured teachers (Ministry of Education, 2001).

The Teacher Education Division of the Ministry of Education is the foremost agency in the country responsible for training teachers. Besides the teacher colleges, workshops and short courses are also conducted by relevant divisions in the ministry, the State Education Offices, District Education Offices, local universities, and other governmental and non-governmental agencies. The courses are offered to both primary and secondary school teachers. A number of courses are offered in the in-service training programmes, such as the special degree programme, smart school courses, and computer maintenance courses (Ministry of Education, 2001).

Lourdusamy and Khim (1992) further categorised the teachers' in-service training in Malaysia into three types, namely enrichment programme, familiarisation programme, and specialisation programme. The enrichment programme focuses on raising and updating the teachers' level of expertise and knowledge while the familiarisation programme help teachers to adjust and fine-tune their knowledge and competencies related to the implementation of new curricula or new roles and practice. Whereby, specialisation programme train teachers in specific area such as special education, guidance and counselling, and educational technology.

In-service training is an important part of a systematic programme in order to improve teaching and learning. As teachers interact in groups, they seek to find ways to upgrade their content knowledge and pedagogical skills. In-service training may comes in a variety of forms, but the ultimate goal of all these trainings is to enhance students' learning and elevate their achievement.

1.2 Background of the Study

In 2002, the Malaysian government announced that English would be used as the medium of instruction for the teaching of Mathematics and Science in schools. To make the transition smooth, it was decided that the policy change would be introduced in phases, starting with Year One, Form One and Lower Six in January 2003. The reason for implementing this policy is to enable pupils to gather information, communicate, think and generate ideas, and produce innovative design regarding mathematics, science and technology in English.

The ultimate goal of this policy is to produce manpower and technocrat community that are able to compete at the international level and thus contribute to the development of the country. To this end, schools have a responsibility to provide each pupil with mathematical skills and English competency necessary for their academic, economic and social growth. It is also the obligation of the Ministry of Education (MoE) to provide well qualified teachers to deliver sound instruction.

In the past, there have been several changes in the teaching and learning of Mathematics in the Malaysian schools. It concerned changes in subject-content, teaching methodology and recently the medium of instruction. After a lapse of 25 years, English is back as the medium of instruction.

It was tough and challenging for the school community during the first year the policy came into effect. Teachers had to be trained overnight to deal with the classes involved. In addition, new textbooks had to be published and special teaching software had to be designed. A large sum of money (RM 5 billion) was allocated in the 2003 Budget for the implementation of the teaching and learning of Mathematics and Science in English for a period of seven years (from 2002 to 2008). Of the amount, RM 978.7 million was spent on ICT equipment to assist teachers to teach these subjects effectively (Jabatan Perkhidmatan Penerangan, 2002). Extensive amount of time, money, and human energy has been devoted in implementing the policy.

The Curriculum Development Centre carried out a study in 2004 on the teaching and learning of Science, Mathematics, English and English for Teaching Mathematics and Science (ETeMS). Twelve schools were selected from all over the country. Findings from the study revealed mixed comments about the effectiveness of the course from teachers who had attended the ETeMS course. From the observation and interview sessions, the study found that most of the science and mathematics teachers were not fluent in English. A year later, the Educational Planning and Research Division did a case study on the implementation of Science and Mathematics in English in seven primary schools in Selangor. Findings from the interview sessions with the teachers revealed that only the Science teachers reported that the ETeMS course help to boost their confidence in teaching Science in English. Almost all the teachers however did not use English in their lessons.

Some of the teachers who teach Mathematics in schools who are above 48 years of age came from the era of English medium of instruction while those who are below 48 years old came from the Malay medium of instruction education system. It illustrates that Mathematics teachers in schools have diverse level of English Language competency based on their educational background.

Teachers are the mediators between curricula, materials, educational goals, and the students. The teaching vehicle tends to be the language and thus teachers' communicative competencies are critical. Besides being proficient in the language of instruction, teachers are also expected to be expert in curricular implementation.

In accordance with the changes in the medium of instruction in Mathematics and Science in the Malaysian education scenario, the Ministry of Education has developed a course called English for Teaching Mathematics and Science (ETeMS). The course is hope to enhance the Malaysian teachers' knowledge and skills in teaching Mathematics and Science in English and at the same time to develop teachers' confidence in using English. Therefore, this study concentrated on determining the extent to which the course objectives is attained.

1.2.1 English for Teaching Mathematics and Science (ETeMS)

The basic argument for switching the medium of instruction from the Malay language to English in teaching Mathematics and Science is the need to elevate the Malaysian children's English proficiency level so as to enable them to contribute productively to the country's development especially in the globalised trade and commerce. A substantial amount of Mathematics and Science knowledge and materials are at present available in English. For this reason, an early introduction to these two subjects through the medium of English will facilitate access to this numerous information.

The policy to change the medium of instruction in the teaching of Mathematics and Science from Malay language to English poses challenges to teachers who have been using Malay language as a medium of instruction. Hence, the ETeMS programme is designed to develop the English language proficiency of these teachers (MoE, 2003). The overall aim of ETeMS is to enhance the English language skills of Mathematics and

Science teachers to enable them to teach effectively using English as the medium of instruction.

The ETeMS programme was developed under the assumptions that the participants of ETeMS possess the content area knowledge and the pedagogical skills relevant to their subject; and participants have a basic level of English language proficiency. With these existing competencies, the course will develop the participants' language for accessing information, language for teaching Mathematics and Science, and language for professional exchange.

The course objectives were formulated to:

i. develop teachers' confidence in using English to deliver content, manage classroom interaction, and to manage teaching-learning in the classroom;

ii. enhance teachers' knowledge in using the correct terminology and classroom language;

iii. upgrade teachers' skills in producing teaching-learning materials, writing notes and scripts, and formulating questions in English; and

iv. expose teachers to the revised curriculum orientation course for Science and Mathematics. (Ministry of Education, 2005a)

The English Language Teaching Centre (ELTC) and the Teacher Education Division are the main providers of training for this programme. The ELTC is responsible for training the national master trainers. The Teacher Education Division with the

collaboration of the State Education Departments, started implementing ETeMS course in 2002. Participants of this course were teachers from Year One, Two, and Three from primary schools and also teachers teaching Form One, Two, Three, and Six. The training mode of the ETeMS courses for the year 2002-2004, consisted of a "2-day on Site" and "5-day Full Immersion" for 30 days. This training mode is divided into two phases, which involves 240 hours of instruction implemented through face-to-face interaction and self-instructional methods. Phase 1 focused on the immediate needs of the teachers by developing their basic English language skills. Phase 2 will also concentrate on building up the teachers language skills with the addition of developing their language skills for professional interaction. The training module used during the course was prepared by the ELTC. The modules contained activities focusing on reading skills, text-processing skills, discussion, classroom language skill, classroom simulation activities, and reflecting on their learning experience and also setting personal goals regarding their language development for the future.

Starting 2005, teachers were grouped according to the subject they taught in schools; Mathematics or Science for the ETeMS course. Before, both the Mathematics and the Science teachers attended the same ETeMS course. The courses for the primary school Mathematics and Science teachers' were handled by the District Education Offices while the courses for secondary school teachers were handled by the State Education Office. These courses were held separately at different venues. The duration of the course has been shortened to fifteen days, continuously. Each day was divided into three slots and each slot was two hours long.

All participants were given a module each during the course. The new module was put together by the panel consisting of Mathematics and Science teachers under the supervision of the Teacher Education Division. The content of the module included communication skills, curriculum orientation course, curriculum in context, courseware integration, task designs, lesson plan, scripting and macro teaching (Appendix A).

For every content area, recommended activities are included. These activities incorporated all the listening, speaking, reading, and writing skills. The activities were carried out individually, in pairs or in group according to the assignment given. All the materials and reading texts used in the activities were of mathematics texts or articles that have numbers in it. Every course participant was required to compile all their work in a portfolio. The portfolio has to be handed-in at the end of the course to be evaluated by the facilitators.

On the last day of the course, evaluation forms from the Teacher Education Division were handed out to all the course participants. Six questions, namely job suitability, course content, module, course duration, course effectiveness, and data on Information and Communication Technology (ICT) were asked (Appendix B).

1.3 Statement of the Problem

Starting 2002, ETeMS courses had been implemented in all states in the country. Since then, a total of 98,000 Mathematics and Science teachers from primary and secondary schools have been trained (MoE, 2006). Seminars and conferences were held

by different organisers to discuss the curricular change pertaining to Mathematics and Science.

A paper was presented at the ETeMS Conference regarding the training of Mathematics and Science teachers. Data from forty-three final year teacher trainees who were trained to teach Mathematics and Science in English in secondary schools showed that only 4.7% were very confident in teaching those subjects in English and more than half of them stated that they needed help from the English language teachers. The survey also indicated a mixed response about their training (Tan & Chan, 2003).

Professional development is considered to be the vehicle by which educators continually enhance their professional knowledge and practice. However, educational literature continues to indicate inconsistent findings regarding the effectiveness of ETeMS. In particular, in-service training research investigating ETeMS denote that the course did not enhance teachers' knowledge, skills, and confidence (Yusuff, 2005; Ministry of Education, 2004; Ministry of Education, 2005b).

Several studies had also been conducted regarding the teaching and learning of Mathematics and Science in English and ETeMS. Juliana (2004) discovered that Mathematics teachers who had attended ETeMS had problems in preparing the teaching and learning materials and also in conducting lessons in English. Similarly, Sadhna Nair (2004) found that Science teachers who had also attended ETeMS still lack the English Language ability to convey the content knowledge to their students.

These studies showed that Mathematics and Science teachers are still having problems despite having attended ETeMS. This problem still existed even after more than two decades. Siti Hawa (1986) and Noor Azmi (1988) conducted studies on Malaysian teachers regarding in-service training and found that in-service training is ineffective in preparing teachers in instigating educational reform because teachers as individuals were not given due attention. Butler (1992) further elaborated that most in-service training were unsuccessful in achieving the pre-determined objectives. The main reason for this failure is because the training lacks the elements of promoting self-understanding, which is necessary for self-development and improvement.

The studies above provide evidence that Mathematics and Science teachers felt they were not adequately trained by the ETeMS course to teach Mathematics and Science in English. The problem is exceptionally serious where evidence suggests that many teachers are teaching Mathematics and Science in the Malay Language. Thus, this evidence raises questions about the effectiveness of ETeMS.

A search of the relevant literature in relation to the ETeMS course revealed that quite a number of studies were carried out regarding participants perception of the overall course (Jansee, 2003 & Norazilawati, 2004), confidence (Mohd Zaaba, 2004), and self-efficacy (Tengku Khairul Zakiah, 2004). However, no serious attempts have been made with regards to the attainment of the course objectives. The studies did not so much engage with issues such as gains in knowledge and skills expected from the in-service

training. Therefore, it is important to evaluate thoroughly whether the course has achieved its objectives.

Only quality professional development can ensure the maximum benefits from the time and money spent. The evaluation form from the Teacher Education Division that course participants had to complete at the end of the ETeMS course was not sufficient and in-depth enough to collect data regarding the effectiveness of the course, as this form is standard form use to evaluate all courses organised by the Teacher Education Division.

Besides the demand for quality professional development, there is also the press for accountability. Given the current stringency of budgets, government programmes are accountable for the activities performed and the results achieved. Thus, it is so vital to assess the effectiveness of the course of English for teaching Mathematics. The evaluation will document the value of the course of English for teaching Mathematics to school organisation, individual educators, and ultimately the students.

1.4 Purpose of the Study

The main purpose of this study was to evaluate the effectiveness of the in-service training course of English for Teaching Mathematics implemented in Kedah. The evaluation concentrated on the attainment of the course objectives. It focused on the views of the participants with regards to the participants' confidence, knowledge, and skills in teaching Mathematics in English.

1.5 Research Objectives

As stated earlier, the purpose of the study was to evaluate the effectiveness of the course of English for Teaching Mathematics according to the course participants' perceptions. Given this purpose, the study addressed the following research objectives:

1. To evaluate the effectiveness of the course of English for Teaching Mathematics on participants' confidence in teaching Mathematics in English;
2. To examine the effectiveness of the course of English for Teaching Mathematics on participants' knowledge teaching Mathematics in English; and
3. To assess the effectiveness of the course of English for Teaching Mathematics on participants' skills in teaching Mathematics in English.

1.6 Research Questions

Specifically, the study attempted to seek answers to the following questions:

1. To what extent did the course developed the participants' confidence in using English to deliver Mathematics content?
2. To what extent did the course developed the participants' confidence in using English to manage Mathematics classroom interaction?
3. To what extent did the course enhanced the participants' knowledge in using the correct Mathematics terminology in English?

4. To what extent did the course enhanced the participants' knowledge in using the correct English language in Mathematics classroom?
5. To what extent did the course upgrade the participants' skills in producing the Mathematics teaching and learning materials in English?
6. To what extent did the course upgrade the participants' skills in formulating the Mathematics questions in English?

1.7 Significance of the Study

The primary purpose of evaluation is to improve effectiveness of a particular programme, product, or service. Thus, information gathered from this study will provide fundamental data for the course organiser to improve the quality of the course. The present study will be significant in a number of ways.

The findings can be used as guidelines to design future or follow-up in-service training activities and to anticipate problems that are likely to occur. The feedback will be valuable to all stakeholders involved. The course organiser need to know if they are doing the right things right. Data from the study will provide evidence that can be used to correct costly errors or to support an exemplary process. Findings from this study will develop a knowledge base to provide effective in-service training programme organise by MoE. If educational effectiveness is to be improved, it must depend directly upon those who are in direct contact with the students.

The most common purpose of evaluation is to determine the effectiveness of a programme (Philips, 1997). In-service training programme must be assessed to document their value to the school organisation, individual educators, and ultimately the students. The study will furnish some insights for a successful implementation of the programme. The study will also identify the perceived strengths and weakness of the implementation of the course of Teaching Mathematics in English. Evaluating the programme will also identify the programme disparity in relation to identify need and recommend institutional attention to the deficiencies. Responds from teachers to survive in a climate of reform need to be uncovered.

The information gained can be utilised to improve the effectiveness of the future undertakings regarding the in-service training for teachers which will lead to significant and sustained improvement in students' opportunities to learn. The development of teachers' potential is very valuable to the success of the learning organisation. This investment is directed to improve competencies which will later lead to superior performance. Competence in this context refers to the skills and knowledge that are critical to the effective performance in classroom.

This study will also be helpful to teachers, administrators and all stakeholders involved in the training of teaching and learning of English for non-optionists. These individuals require a profound awareness of how individuals are affected by the programme and what liability to avoid as they participate in the Teaching English for Non-Optionists course. To achieve a better understanding of what the teachers has

gained, it is important to take a closer look at the ETeMS. Besides enabling teacher educators to better understand how teachers can be assisted, the results may indicate directions for development of new programmes and strategies for improving the quality and effectiveness of professional development programmes.

The study is significant because the findings would shed some light on new, additional and extensive information regarding teacher training activities, therefore making the training more meaningful and relevant to the real work of teaching. Findings from this study are also expected to suggest alternatives strategies that can be implemented in schools in order to make the policy a success. It is also hope that the findings will contribute towards the enhancement of the teaching and learning process and also promote the teaching professionalism.

1.8 Operational Definition

In-service training - This kind of training referred to opportunities for practising teachers to attain new skills, knowledge, approaches and dispositions for improving their classroom teaching and effectiveness. According to Sparks and Hirsch (1997), in-service training, professional development, and staff development should affect the knowledge, attitudes and practices of those trained. The terms in-service training, professional development, and staff development are used interchangeably in this study to refer to the lifelong learning activities to develop the teachers professional competence, personal education and aspirations, and general understanding of their changing roles and tasks.

Effectiveness – The term is concerned with how far a course or activity has brought about the intended result pertaining to the acquisition of professional knowledge and skills expected of a participant (Bramley, 1990). In this study, effectiveness referred to the accomplishment of the course objectives which is to determine whether the objectives have been achieved.

Confidence – Tchudi and Mitchell (1999) define confidence as feeling psychologically and emotionally safe in the learning environment and certain of his or her capabilities in taking risks. In the context of this study, confidence captured the respondents' ability to convey ideas, concepts, facts, leading discussion, questioning, eliciting responses from students and the ability to explain to students in English.

Knowledge – According to Brown and Borko (1992), definition of knowledge covers both the facts learned and the strategies learnt for using those facts. It involves the recall of specific information, technical terms and familiar with words and their meanings. For the purpose of this study, knowledge referred to the ability to store factual information about mathematics terms and know when to apply it. Knowledge also referred to the ability to use correct form and usage of English in either speech or in writing.

Skills – Skills according to Blanchard and Thacker (2003) is defined as general capacities to perform a set of tasks developed as a result of training. Therefore, skills in the present study referred to the demonstration of new competencies in writing, using grammatically

and correct language in preparing teaching and learning materials and formulating questions.

Evaluation – For the purpose of this study, evaluation focused on the effectiveness of the English for Teaching Mathematics course. The effectiveness was measured using data collected from the questionnaire, observation, tests and interview. The data collected are used to identify whether discrepancies exist between the course objectives and the outcomes.

1.9 Limitations of the Study

The following are some of the identified limitations:

i. It is important to note that this group of teachers who were respondents in the study are not representative sample of Malaysian teachers and that the results are therefore, cannot be generalise to the population of Malaysian Mathematics teachers. The evaluation of a particular programme in a given location can provide useful information about the programme in that place;

ii. Programmes are continuously changing. Some of the changes are quite natural and represent normal processes of growth and change in an educational enterprise. Thus, any evaluation is at least partially out of date by the time data are gathered and analyzed; and

iii. When respondents are asked to evaluate, there may be a tendency to project grievances or prejudices into the selection of responses during the interviews. The assumption will be made that the respondents will give honest and accurate information.

1.10 Organisation of the Study

The report of the study is organised into five chapters. Chapter One has provided the introduction and context for the present study. Chapter Two furnishes the background for the study by examining the literature on professional development, evaluation, and related research. The methods, procedures, and data collection techniques are the focus of Chapter Three. Chapter Four presents the findings obtained from the data. It includes detailed results related to the research questions. Finally, Chapter Five offers the discussions, implications and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The aim of this study was to evaluate the in-service training course of English for teaching Mathematics. This chapter presents relevant literature reviewed for the present study. The literature review begins with a brief history of language development in the Malaysian educational system. It cites events related to changes in medium of instruction in schools. The next part deals with evaluation models and various definitions of evaluation, programme evaluation, and professional development. The third part reviewed students' language proficiency and mathematics achievement, related studies on in-service programmes and teachers' perception on teaching mathematics and science in English, and also the framework of the study. A summary concludes this chapter on literature review.

2.2 Historical Background on Language Development

Briefly the history of the educational development in Malaysia can be divided into four periods: the pre-British period (before 1824), the pre-world war II period (1824-1941), the pre-independence period (1941-1957), and the post-independence period (after 1957). Therefore, the history of the development and changes in the medium of instructions in this study was written corresponding to the four periods.

During the pre-British period (before 1824), very little is known and documented regarding education. Schooling consisted mainly of religious classes focused on Al-Quran and religious matter conducted by the Muslim missionaries, which later developed into formal religious schools known as the *pondok* schools.

Education during the pre-world war II period (1824 – 1941) was available in four language media: Malay, Chinese, Tamil, and English, and in four separate school systems serving different purposes. Teachers for the Chinese and Tamil schools were brought in from China and India respectively while teachers in the Malay schools comprised of local Malays. The English medium schools were performing better than the other schools. This is due to better facilities and qualified teachers as well as pupils from advantage background. The secondary education was only available in the English government and mission schools. Later in the 1930s, the British government introduced the Special Malay Class to enable Malay children from Malay schools to further their studies in English secondary schools.

During the Japanese Occupancy from 1941 to 1945, education was used as a media to inculcate loyalty to the Japanese emperor. The Japanese language became the official medium of instruction for all subjects in vernacular schools. The English and Mandarin languages were banned in schools. Local teachers were trained to teach in the Japanese language.

After the Second World War, the Cheeseman Plan (1946) was implemented. The plan advocated free primary education and the use of the four different languages as medium of instruction in secondary education. The teaching of 'mother tongues' was to be made available in the English schools, and vice versa, English subject was to be made compulsory in all vernacular schools. However, the policy did not promote national integration and was later abandoned in 1949. Before the end of the British colonisation, the Barnes Report was put forward to develop a national education system in Malaya.

The Barnes Report of 1951 recommended a national school system, which would furnish primary education for six years using Malay or English language as the medium of instruction. English will be used in secondary education. The non-Malays community was not happy as they saw this as a way to eliminate their language and cultural identity. The Fenn-Wu Report of 1952 recommended that pupils in Chinese schools would besides learning Chinese will also learn Malay and English and integrated into the national system and not be eliminated. This recommendation made the Chinese medium pupils trilingual.

The Razak Report in 1956 laid the foundation of the National Education Policy. The report incorporated the ideas of the Barnes and the Fenn-Wu Reports. The report called for the existing Malay medium primary schools to be converted to national schools, whereby Chinese, Tamil, and English schools into national-type primary schools. The Malay and English languages were also made compulsory for all these schools with a uniform national curriculum. The Razak Report stressed that the Malay

language was to be the National Language, and that other local languages will be maintain. In 1958, the Malay-medium classes were launched in selected English-medium secondary schools and ten years later in 1968 the same classes were opened in vocational schools.

In 1960 the National Education Policy was reviewed. Among the recommendation proposed by the Rahman Talib Report were the introduction of the Malay language as the main medium of instruction and the provision of a place in a primary school using the medium of instruction of the parents' choice. The report recommended that secondary education paid for from public funds should be conducted in either Malay or English languages and in due course the National Language will be the main medium of instruction, aside from that other languages and literatures may be taught in their own media (Rahman Talib Report, 1960). As a result, the English national-type schools were phase out starting 1970 by changing the medium of instruction to the Malay language.

Later, the Education Enactment Bill of 1971 proposed a common content syllabus for all primary schools to ensure all pupils learn the same skills and acquire knowledge on a similar level. By the end of 1982, the change of medium of instruction to the Malay language throughout the primary school system in the country was completed. Malay and English languages are made as compulsory subjects in all schools regardless of the medium of instruction. The teaching of the Chinese and Tamil languages is obligatory in Chinese and Tamil schools respectively. Additionally, the national schools must provide