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THE USE OF ICT IN TEACHING OF ETTecS SUBJECTS IN ENGLISH

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DISERTASI DIKEMUKAKAN BAGI MEMENUHI SYARAT UNTUK
MEMPEROLEH IJAZAH SARJANA PENDIDIKAN

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DECLARATION

I hereby declare that the work in this dissertation is own except for quotation and summaries which have duly acknowledged

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ABSTRACT

This study was conducted to investigate; (i) the usage of ICT among teachers involved in ETTecS programme, (ii) the type of ICT applications used by the teachers, and (iii) whether there was a strong relationship between the usage of ICT and the level of confidence among ETTecS teachers in utilizing English as the medium of instruction in their classrooms. The data were collected using questionnaire and semi-structured interview. The respondents consisted of 97 teachers who were teaching Science, Mathematics and Technical subjects from eight technical schools in Pahang. The data obtained from the questionnaire were computed and then analyzed using Statistical Package for Social Science (SPSS) Version 12.0. The findings of the research revealed that the usage of ICT among teachers was high and they were keen and felt comfortable in using the ICT applications. In addition, the research also indicated that the ICT facilities provided by the Ministry of Education had helped the teachers to utilize English as the medium of instruction.

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ABSTRAK

Kajian ini dijalankan untuk melihat; (i) penggunaan ICT dalam kalangan guru-guru yang terlibat dalam program Pengajaran Matematik dan Sains dalam Bahasa Inggeris, (ii) jenis melihat aplikasi-aplikasi ICT yang digunakan oleh guru, dan (ii) samada terdapat perkaitan di antara penggunaan ICT dan tahap kesediaan guru dalam menggunakan ICT di dalam sesi pengajaran mereka. Data dikumpul dengan menggunakan kaedah soal selidik dan temubual. Responden terdiri dari 97 orang guru yang mengajar mata pelajaran Sains, matematik dan Teknikal dari lapan buah sekolah teknik seluruh negeri Pahang. Data yang dikumpulkan melalui borang soal selidik dianalisa menggunakan Statistical Package for Social Science (SPSS) Versi 12.0. Kajian mendapati bahawa penggunaan ICT dalam kalangan guru adalah tinggi dan guru berminat untuk menggunakan perisian yang mereka rasa selesa untuk dikendalikannya. Selain itu, kajian juga mendapati bahawa, peralatan ICT yang dibekalkan membantu guru-guru untuk menggunakan Bahasa Inggeris dalam sesi pengajaran mereka.

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LIST OF ABBREVIATIONS

ELTC	English Language Teaching Center
ETeMS	English for the teaching of Science and Mathematics Subjects
ETTecS	English for the teaching of Technical, Science and Mathematics Subjects
ICT	Information and Communications Technologies
MST	Mathematics And Science Teachers
LPE	Language for Professional Exchange
T&L	Teaching And Learning

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CHAPTER ONE

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INTRODUCTION

1.1 Background of the study

As an international language, English is seen as an important medium of instruction which caters for a fast and more comprehensive development for a country such as Malaysia. In this respect, the ability to communicate effectively in English is seen as a means for Malaysia to produce workers who are knowledgeable and skilful in various areas such as economic environment, administration, education, trade or finance (Robinson & Zaitun, 2006). Through English, Malaysian students are expected to gain

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further advantage in learning and adapting new knowledge that will enable them to compete at international level.

The decision to use English is based on the rationale that mastery of English is considered important for direct acquisition of knowledge in the field of science and technology. In January 2003 the government re-introduced English-medium education in Year One (Primary Year One), Form One (Secondary Year One) and Lower Six (A-Levels Year One) in all fully aided government schools (Foong-Mae, 2002). In 2006, the Technical Education Department implemented its own version of ETeMS known as English for the Teaching of Technical, Mathematics and Science subjects (ETTecS). In this programme, English was used as the medium of instruction for Mathematics, and Science subjects which comprised of Applied Science, Physic, Biology, Chemistry, Mathematics and Additional Mathematic. The implementation of the ETTecS programme also included Technical subjects such as Mechanical Engineering Studies (MES), Electrical and Electronics Engineering Studies (EEES), Civil Engineering Studies (CES), Engineering Drawing (ED) and Engineering Technologies (ET). In addition, it included Vocational subjects from Computer Programming Courses such as Fundamentals of Programming (FOP) and Programming and Development Tools (PDT).

In making the teaching and learning processes more effective and interesting, Information and Communications Technologies (ICT) is used as the main tool to help both teachers and students learn and use better English. Teaching materials which integrated ICT are developed as teaching and learning tools to enrich the curricula, enhance pedagogies, create effective organisational structures in schools, create

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stronger links between schools and society and establish empowerment among learners. Thus, the introduction of ICT by the Ministry of Education is believed to be a step in direction of developing potentials and revolutionising education and to improve learning process, as similar to what had happened to other sectors such as medicine, finance and manufacturing (Foong-Mae, 2002). In addition, ICT also assisted students in their learning such as acquiring English language competency as well as enhancing the quality of their learning experiences (Robinson & Zaitun, 2006).

For this purpose, the government allocated a fund worth RM5 billion from 2002 to 2008 for teacher training and providing grants to schools to purchase educational aids that included ICT equipments. A sum of 978.7 million Ringgit was spent in the year 2003 to purchase notebook computers, LCD projectors and other related equipment (Mahathir, 2002). For the Ministry of Education, ICT was seen as a means, not an end in itself.

The implementation of ETeMS stirred many opinions from various parties (Fong-Mae, 2002), for example the Malaysian nationalists who argued that the implementation of ETTecS was incompatible with the 1952 National Language Act (Pillay, 2003). In sharing the same issue, the Chinese Community was as equally vociferous in its opposition to the change. Chinese based political parties, such as Gerakan took a hard-line stand against the policy (Pillay, 2003). On the contrary, for those who were directly involved in English Language Teaching (ELT), this decision was considered as a long overdue decision (Foong-Mae, 2002). However, for others,

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especially the Science and Mathematics teachers, it seemed to be the beginning of a nightmare (Pillay, 2003).

The objection to ETeMS occurred as the public had doubtful beliefs and opinions towards its achievement due to various reasons. Firstly, English language proficiency among science and technology teachers is low (Alwis, 2005; Pillay & Thomas, 2004). Secondly, students are not interested in learning the English language because many of them felt that they were having less or little use of English in their daily lives (Alwis, 2005).

1.2 Problem Statement

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With the introduction of ETeMS, science and technology teachers are required to use English language and also ICT in their teaching and learning. There are three crucial problems that needed to be looked into, especially for teachers who are coping with the policy change. The first problem is teachers' competencies in utilizing ICT which is a new phenomenon in the school context in Malaysia as it is considered as a new teaching and learning methodology among teachers (Hamidah et al., 2005). The second problem is on the readiness of schools in providing sufficient equipments that successfully support the implementation of ETeMS. While the third problem is on the low level of English language proficiency among teachers of these subjects (Pilay & Thomas, 2004).

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Although the SMART School system was first introduced to the Malaysian Education system in the late 1990s, but, the number of SMART Schools established in the country was rather small in its early days. Therefore, only a very limited number of teachers in the country had the opportunity and experience in learning and practically integrated the technology in classroom environment while the majority of them were still in the dark as far as using the technology in the classroom was concerned. Although some argued that for many of the younger teachers, they had at least used ICT while pursuing their tertiary education however the knowledge and skills using ICT was to complete their assignments and it was not the same as using ICT as a medium to disseminate knowledge (Hamidah et al., 2005). In addition, Robinson & Zaitun (2006), found that teachers were lacking ICT resources and facilities in schools as the most common reason that impeded the integration of ICT in the teaching and learning process.

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For the ETeMS teachers, many of them had low level of English proficiency as they completed their education, beginning from the primary right up to the tertiary level, in Bahasa Malaysia. This declination of English started in 1970, when all Government-aided English Medium schools were replaced by Malay-Medium schools and by 1982, and all national secondary and university education were conducted in the national language (Mauzy, 1985). Consequently, the teachers who went through this education system had inadequate proficiency in English (Noraini, Cheong, Norjoharuddeen, Ahmad Zabidi & Rahimi, 2007).

Consequently, to ensure the success of teaching of Science, Mathematics and Technical subjects in English, these problems had to be addressed immediately. In

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teaching, teachers are not only required to operate relevant courseware but they have to explain and elaborate contents necessary or important information to the students. ICT is used as a method to stimulate classroom discussion and helped teachers to effectively disseminate the content of the lessons. Therefore, teachers are not only expected to have an acceptable good command of English language for their classroom instruction but also sufficient abilities to use and integrate ICT. Only with these capabilities, teachers could successfully utilize and exploit ICT based teaching aids supplied by the Ministry of Education.

1.3 Research Objectives

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The key purposes of this study were to investigate the use of ICT in assisting teachers in utilizing English as the medium of instruction in the ETTecS programme. Within this context, the researcher wanted to know whether ICT enabled teachers to deliver their teaching effectively.

This study was carried out based on the following objectives:

1. To observe the utilization of ICT by ETTecS teachers.
2. To find out how ETTecS teachers integrate ICT in their teaching.
3. To investigate whether ICT assist ETTecS teachers in their teaching.
4. To identify related obstacles with regard to the use of ICT by ETTecS teachers.

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The first objective provided valuable insight on the utilization of ICT in supporting the implementation of ETTecS. Next, the second objective enabled the researcher and other interested parties to know how teachers exploited ICT to suit their teaching preferences and needs while the third objective determined either ICT helped teachers in their teaching process or otherwise. Lastly, the fourth objective gave insights for relevant parties to ponder related issues that prohibited the utilization of ICT in assisting teachers.

1.4 Research Questions

In a more specific manner, with regard to the use of English as a medium of instruction in ETTecS, the researcher tried to find the answers based on the following research questions.

1. Did teachers use ICT in ETTecS implementation?
2. How did ETTecS teachers integrate ICT in their teaching?
3. Did ICT assist ETTecS teachers in their teaching?
4. What were the obstacles that impeded ETTecS teachers in the utilization of ICT?

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1.5 Justification for the study

This study is expected to add the existing knowledge in the field of education. There is a lack of research done on the usage of ICT in the teaching and learning of Mathematics and Science in English in Technical Schools in Malaysia. This study will also help to identify problems that occur during the implementation of the ETTecS programme. Other than that, this study provides data analysis and offers valuable feedback on the actual scenario on the utilization of ICT by ETTecS teachers in delivering a more meaningful lesson in English. The data will enable researchers to focus on topics and problems that need attention and to suggest hypothesis that can be examined in further research. For the school authorities and the top management, especially the Ministry of Education, this research will enable them to reflect on the efforts made by the teachers in improving their English language proficiencies and ICT skills, and also in adopting new pedagogical methods. Hopefully, this information will allow school administrators to have better monitoring system towards the development of ICT usage and the significance of teachers' roles in the implementation of ETTecS programme. In addition, the findings of this study will form the basis for a future study that will look on how the effectiveness of ICT in classroom teaching could be enhanced.

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1.6 Scope and limitation of the study

This study focused only on Science, Mathematics and Technical teachers in eight technical schools in Pahang. The respondents were selected based on the their involvement and teachers teaching the following subjects; Science, Physics, Biology, Chemistry, Additional Mathematics, Modern Mathematics, Mechanical Engineering Studies, Civil Engineering Studies, Electrical and Electronics Engineering Studies, Engineering Drawing, Engineering Technology, Fundamentals of Programming and Programming and Development Tools.

This group of teachers was chosen because ETTecS programme was being implemented in these eight schools. Therefore, the researchers had good opportunity to come up with a comprehensive and conclusive study. Furthermore, the researcher was also a teacher teaching in a technical school and was the Secretary for the ETTecS Committee. With his knowledge, the researcher had good understanding on the implementation of the programme.

Since the number of respondents involved in the study was relatively small, the findings of this study should only be referred only to those schools and participants involved in the research.

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1.7 Definition of terms as being used in this study

To equip readers with better understanding on the thesis, below are some of the important terms of the research.

1.7.1 ICT

According to Search-CEO.Midmarket.com (2003) the definition of ICT or information and communications technology, is a term which includes communication devices or application such radio, television, cellular phones, computer and network hardware and software, satellite systems and so on. It may also include various services and applications associated with them, such as video conferencing and distance learning. While Wikibooks (2011) defines ICT as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information. These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony. For the scope of this research, the term ICT is applied to all computers (comprising desktop and laptop), internet, LCD screens, specially designed teaching courseware, projectors and other related items provided by the Ministry of Education solely distributed and used in the ETTecS programme.

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1.7.2 Assist

According to Merriam-Webster (n.d) on-line dictionary, the word assist could be defined as to give supplementary support or aid. For the purpose of this research it refers to situation where ICT would help or support teachers in utilizing English as the medium of instruction in the ETTecS programme.

1.7.3 Technical, Vocational and Sciences Subjects

For the purpose of this research, the Technical, Vocational and Sciences subjects are being referred to the subjects that being taught in the eight schools involved in this research. Technical subjects refer to Mechanical Engineering Studies (MES), Civil Engineering Studies (CES), Electrical and Electronics Engineering Studies (EEES), Engineering Drawing (ED) and Engineering Technology (ET). While the Vocational subjects refer to Fundamentals of Programming and Programming and Development Tools. And Science subjects refer to Physics, Chemistry, Biology, and Science.

1.7.4 Mathematics Subjects

For the purpose of this research, this term is being referred to Mathematics and Additional Mathematics subjects that were taught in the eight schools involved in this research.

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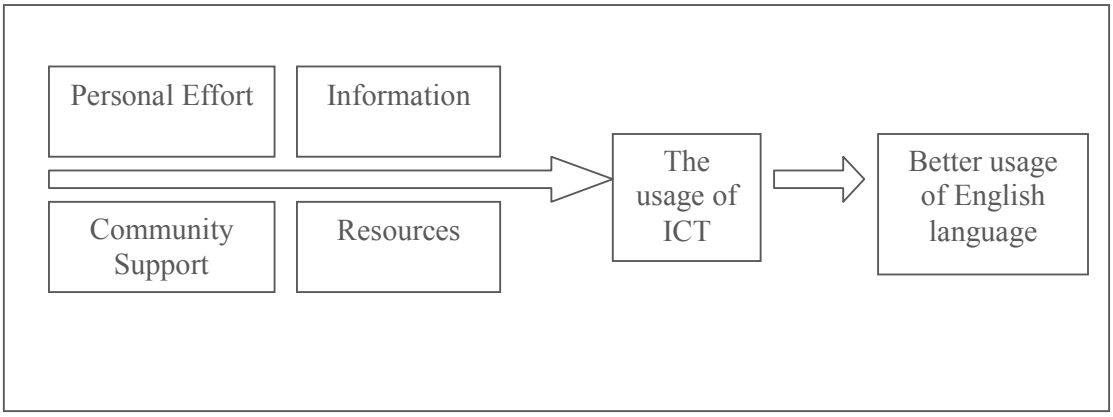
1.8 Theoretical Framework

Figure 1
Theoretical Framework



For the purpose of the study, the researcher adapted the Veech Innovation Model by Veich (1996). In this theoretical framework, there are four factors influencing the use of ICT in the ETTecS programme.

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In this theoretical framework, the four main factors which contribute towards better usage of English are; personal effort, community support, information and resources. The first factor is personal effort. Teachers play an important role for any innovation to take place in the teaching and learning process. For the teachers to be really involved with the programme they need to be creative and have the ability to use ICT and English as a medium of instruction is something new to them. To be in this state of mind, teachers need to have positive attitude towards the implementation of ETTecS.

The second factor is information. In order to implement the programme successfully, teachers need to have clear understanding on their roles in the

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programme. As important key-personnel, teachers need to have a clear picture on the whole implementation of the programme. In addition they need to have sufficient information on the usage of ICT and full support from all parties involved with the programme such as the schools administrators.

The third factor that contributes towards the usage of ICT in teaching and learning process is the community support. Teachers would not be able to carry out this programme individually on their own. For them to be successfully, teachers need support from various parties and institutions. The school administrators for example play an important role to support any effort made by the teachers. Other than that, other parties such as their own colleague, society and parents need to show their support in order for the teachers to continually improving their effort towards making the programme a success.

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The last factor that contributes towards the success of this programme is resources. Facilities such as lap tops, LCD and software are required to cater the needs of all teachers and students. Only by having these facilities, teachers would be able to use ICT in their teaching and thus promoting better usage of English as the medium of instruction. The availability of these facilities are important for ICT to be utilized in the teaching and learning process.

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1.9 The organization of the thesis

In reporting the study, this thesis is divided into five chapters: Chapter 1 sets out to introduce the background of this research. It briefly describes the background of the study and the nature of using ICT in classroom teaching especially with the purpose in assisting teachers to utilize English as the medium of instruction. Then, it also presents the statement of the problems of why this study is initiated and then followed by the research objectives and the research questions. The justification and the scope of limitation of the study are also discussed. The chapter also presents some important definitions that will assist reader to have ample information in understanding the research paper.

In Chapter 2, relevant literatures are examined. It discusses the current transition on the implementation and usage of ICT in classroom teaching and instruction and the effects of using ICT with the purpose of assisting teachers in utilizing English as their medium of instruction. In addition, relevant literature on the usage of English as a medium of instruction in various education systems is also being discussed. Other than that, it also looks at the possibilities that could be implemented by teachers in ensuring the total utilization of ICT for their classroom teaching purposes. Some issues on resistance to change are also highlighted.

Chapter 3 describes and justifies the research design and strategies used in this study. It also contains a description of the population, selection of sample, the instrumentations and the detailed procedures adopted.

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Chapter 4 presents the analysis of data using SPSS. This chapter analyses the data collected. Instruments used were: questionnaires and. A summary of the results from the findings is laid out at the end of the chapter.

Chapter 5 summarizes the details of the study. Relevant information is discussed in the context of the research questions. It presents the data that lead to the answer of the research questions posed. It highlights some new insights to the study. Recommendations to relevant authorities are derived from the findings of the study. It is also hoped that the recommendations would be able to improve or enhance the implementation of ETTecS. The limitation of the study conducted is also described. Finally, the implications of the results of this research are also discussed for further research in this field and in addition, a reference list and appendices are attached to the thesis.

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1.10 Summary

This chapter has outlined the core concerns of each chapter and summarized the central research objectives of this study. Although there is a great deal of research done concerning the integration of ICT in classroom setting but still, few were done within the Malaysian context especially for technical and vocational schools. Focussing specifically on this technical and vocational schools, this study aims to provide a good understanding on computer usage in Science and Mathematics classes for related and relevant parties in order to carry out proper planning in the implementation of ICT in the Malaysian Curriculum system.

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