CHAPTER ONE

INTRODUCTION

1.0 Introduction

In the Malaysian Ministry of Education Annual Report (2002), it is stated that "The Government through a special meeting of the Cabinet on 19 July 2002 decided to implement the teaching of Science and Mathematics in English beginning 2003"(p. 43). In line with the implementation, English is made the medium of instruction for Mathematics and Science for Year One in the primary schools, Form One in Secondary Schools and Lower Six in Upper Secondary Schools beginning January 2003. This change in the medium of instruction has created different responses from learning institutions, parents, teachers and students. A study by Samuel and Sithambaram (2005) state the following:

> A shift in the language of instruction is a radical move in any educational system because learning is mediated through language in the texts read, and in interaction between teachers and learners and among learners. Furthermore, a change in the language of instruction has far reaching implications for ways in which students and teachers will make meaning and communicate it. (p.39)

However, Tun Dr. Mahathir Mohamad, the former Prime Minister and a panel of educators who have initiated and implemented the change in policy in the Malaysian Education System, justify the shift in the medium of instruction for teaching Science and Mathematics in English. This is evident in Gill (2006) who has stated in an electronic article about her interview with the former Prime Minister Tun Dr. Mahathir on 16th June 2005, pertaining to the issue of the change in language policy in Malaysia (EMI in Higher Education in Malaysia: The Dilemma of the State and Agents of Implementation, p. 3). In the interview, Tun Dr. Mahathir explains that "Education is for the purpose to acquire knowledge and language is the tool to access the knowledge".

He also states that if a particular language creates opportunity to access information on Science and Technology easily, then that language should be encouraged. In fact, Tun Dr. Mahathir postulates that any latest information on Science inventions and discoveries are majority published in English language. In addition, he explains that the "translation of English texts to Bahasa Malaysia will require three skills; skills in both Bahasa Malaysia and English as well as skill in the subject that is to be translated" (p. 3). Therefore, if students learn English, it will be easier as they will have broader access to all information which is in English language (EMI in Higher Education In Malaysia: The Dilemma of the State and Agents of Implementation, p. 3). As such, in order to compete with developed countries in the fields of information and communication, the importance of English language in Science and Technology is imperative. Furthermore, the acquisition of English Language could further engage a direct link to various scientific research studies.

Datuk Seri Syed Hamid Albar from the Ministry of Foreign Affairs points out that the government has taken measures to give adequate attention to English language in order to fulfill the high demand of English language and to prevent being uncompetitive in the eyes of the world. (Malaysian International Conference of English Language Teaching, 2002, p. 1) . This clearly implies that a change in the Malaysian Education System through the shift of English as the medium of instruction to teach and learn Science and Mathematics is necessary and essential.

In a daily tabloid, *The Star,* Datuk Seri Ong Ka Ting, the Malaysian Chinese Association (MCA) President, supports the shift in the medium of instruction for teaching Science and Mathematics in English. (The Star: "Ong: English gives competitive edge", 2006, p. N8). He agreed that the teaching of Mathematics and Science in English can

develop students for globalization. In other words, it is essential to master the English language as to be competitive globally.

In fact, according to The Ninth Malaysia Plan (2006-2010), greater importance is given to upgrade Science and Mathematics and English Language in order to develop "capacity for knowledge and innovation".(Ninth Malaysian Plan, 2006-2010 "Enhancing Human Capital", 2006, p. 254). In line with the need, studies by Ramiah, Koo and Mustafa (2006) have pointed out the importance of mastering Science and the English language as they quote "whilst Science is seen as a tool for economic empowerment, the English language is seen as the key for the acquisition of this tool" (p. 199).

Moving from the national level perspective, this study will focus on school level in the teaching and learning of Science in English. Though the Malaysian government emphasizes the importance of acquiring knowledge of Science in English, it has become a great challenge for teachers, who have taught in Bahasa Malaysia and to students, who have learnt in Bahasa Malaysia, are now expected to switch over to English. This change in the medium of instruction to teach Science has either become a boon or bane for teachers as well as learners. Therefore, this research study will look into the problems faced by teachers as well as students in the teaching and learning of Science in the English language.

In 2004, a study carried out by Ambigapathi and Revathi, revealed problems faced by teachers and students in the teaching and learning of Science in English. As far as students are concerned, their concept of learning Science in English is not a necessity because other subjects offered to them are taught in Bahasa Malaysia. As a result, the need to learn in English for Science and Mathematics is not crucial. For teachers, they face proficiency problems using English as the medium of instruction. Ambigapathi and

Revathi (2004) further stated that Science teachers encounter difficulty in delivering the Science content using English language whereas students learning Science in English, find problems in both understanding English and understanding the Science concepts as Science concept involves heavy scientific meanings and terminologies (Ambigapathi & Revathi, 2004, p. 51).

In 2006, a study by Ramiah, Koo and Mustafa concluded from the Interactive pedagogy perspective that, the Malaysian Science teachers need to help learners, "bridge the difference" between theories of Science and curriculum–based Science in secondary school (p. 93). Ramiah et al., (2006) stressed the difference between English used in the Science classroom and English used in the language classroom in which the former "involves features and functions of science discourse that is applicable to scientific context compared to communicative English used in language classroom" (p. 193). Bennett (2003) claimed that in order to understand the Science content, students need to be familiar with a vast choice of scientific words (p. 147). She adds that Science is a study which integrates exploration and investigation of Science words and meanings as well as the link to each other. It involves "in depth understanding of content and being able to think scientifically"(Bennett, 2003, p. 147). Therefore, to express the scientific information precisely, good command of language is essential in order to communicate the ideas well. This is where English language plays an essential role in communicating the scientific ideas through the teaching and learning of Science using the English language.

1.1 Background of the Study

The study was carried out in a selected urban school in Selangor; Sekolah Menengah Kebangsaan Bukit Jelutong in Shah Alam. The school started operating in

January 2003, in accordance with the year in which the teaching and learning of Science and Mathematics in English was introduced by the Ministry of Education. The first batch of teachers in 2003 was 13 and students were 120. The researcher was part of the first batch of teachers and has been teaching English since 2003. SMK Bukit Jelutong being a new school, started the teaching and learning of Science in English in line with the government policy, was chosen as the sample study for this research .

In 2007, the total population of students in SMK Bukit Jelutong was 1,150 and the total number of teachers was 60. It has been a one-session school since its commencement in 2003. From the total population, 60% of the students hail from the Bukit Jelutong residential area, an elite group with a high standard of living while the remainder 40 % comes from the vicinity of Bukit Jelutong.

Figure 1.1 shows the distribution of SMK Bukit Jelutong students from various residential areas in year 2007.

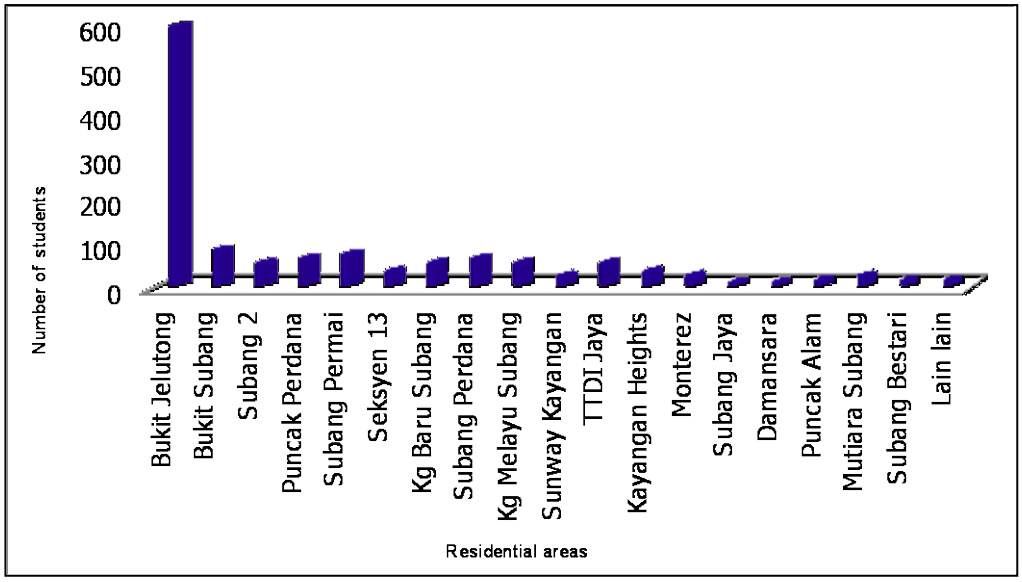

Figure 1.1

Distribution of SMK Bukit Jelutong students from various residential areas

From the total population of 1150, 245 are Form Three students. Figure 1.2 shows the percentage of Form Three students according to race.

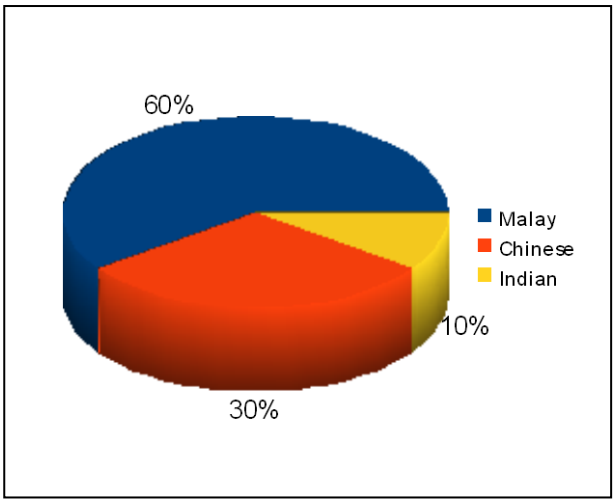

Figure 1.2

Percentage of Form Three Students According to Race

Figure 1.2 shows 60% of the total 245 Form three students are Malays, 30% are Chinese whereas 10% are Indians. The Form Three students hail from Bukit Jelutong and the surrounding vicinities of Bukit Jelutong.

There are seven classes of Form Three and the students are streamed in each class based on their overall performance in the school-based examination when they were in Form Two. Table 1.1 shows the categories of Form Three classes and the number of students in each class.

Table 1.1

Categories of Form Three Classes and Number of Students

Classes	Number of Students
3 Alpha	37
3 Beta	40
3 Delta	40
3 Sigma	35
3 Omega	35
3 Epsilon	29
3 Zeta	29
Total : 7 Classes	**Total : 245 Students**

Table 1.2 below highlights the achievement level of the students based on their overall performance in the Form Two examination in all subjects. The evaluation system of a student is based on four school-based exams; March Test, Mid Year Examination, August Test and Final Year Examination. 10% of each subject's score will be carried forward to the following examination to be added with 90% of the present score. This procedure is carried out until the final examination. Finally, based on their scores in all subjects, they are ranked in the whole form and for the following successive year. The first top 35 students will be placed in the first class followed by the next rank of students. The first class is Form 3 Alpha, students with excellent level of performance, followed by Form 3 Beta which also has excellent performance level and the rest of the classes follow suit as illustrated in Table 1.2. New students were also placed in the respective class based on their academic achievement in their former school.

Table 1.2

Categories of Classes and Overall Achievement Level of Students

Classes	Overall Achievement Level
3 Alpha	Excellent
3 Beta	Excellent
3 Delta	Average
3 Sigma	Average
3 Omega	Moderate
3 Epsilon	Weak
3 Zeta	Very weak
Total : 7 Classes	

The researcher is an English teacher of SMK Bukit Jelutong since 2003, and she is also the coordinator of all the Form Three classes in 2007. For this study, the researcher has looked into the Science marks obtained by students in their Form Two examinations. The Science exam papers set by the school were all in the English language only. This was adopted as students were exposed to learning Science in English language since they were in Form One. Students were also required to answer their Science exam paper in the English language.

The Form Three students in the 'Excellent classes' possess a good command of English and are able to communicate in English well. Some of them speak in English at home or with friends or come from an English speaking background. Most of the secondary students hail from the urban Bukit Jelutong residential area. Their score in Science range from 70% to 100% whereby students from 'Average classes', have a good command of language as they are exposed to language use more among their circle of friends. Their scores in Science range from 60% to 90%. In the moderate class, students tend to use simple language to communicate or even speak less in English. Their marks range from 35% to 60%. In weak and very weak classes, around ten students speak a few English words and are mostly poor in English language as it is

never used at home or at school. These students use or speak the target language during the English lessons in the classroom. Their Science scores range from 15% to 50%. The researcher having taught English since 2003, has taught the students since Form One in 2005 up to Form Three in 2007 and being the coordinator of the Form Three classes in 2007, has direct communicative experience with her students in the classroom and during school co-curricular activities.

Four female Malay teachers teaching Science were also considered as secondary respondents for the purpose of this study. They possess a degree in Science Education and have teaching experience of between 8 to 20 years. However, they have learnt Science in Bahasa Malaysia in their primary, secondary and tertiary levels and have taught Science in secondary schools in Bahasa Malaysia. However, since the medium of instruction for the teaching of Science changed in 2003, they teach Science in the English language.

1.2 Brief History of Language Policy in Malaysian Education.

Malaysia gained its independence from the British in 1957. After independence, Malaysia decided to establish an identity which reflects its own nationalism in which Bahasa Malaysia was chosen as the National Language. The first Prime Minister of Malaysia, Tunku Abdul Rahman who manifested the "philosophy of an authentic indigenous language"(Hassan, 2005, p. 4) described:

> It is only right that as a developing nation, we want to have a language of our own. If the National Language is not introduced, our country will be devoid of a unified character and personality - as I would put it, a nation without a soul and without a life
> (Hassan, 2005, p. 4)

Wong and Ee (as cited in Hassan, 2005, p. 4) state that, the nationalism factor and national unity is what has driven towards the substitution of 'Colonial Language'- English language to an "indigenous Malay language"- Bahasa Malaysia respectively.

Asmah (as cited in Chan, 2006, p. 3) justifies that, the Malay language possesses the best criteria to be selected as a National language for Malaysia based on factors such as "its ingenuity, role as a lingua franca, position as a major language, possession of high literature and an important language for administration and diplomacy in the Malay History". Nevertheless, Hassan (2005, p. 4) states that though the Malay language has set the benchmark as the language of "administration, culture, trade, diplomacy and philosophy, it lacked the terminology of science and technology" and requires mass development for the purpose of transmitting sufficient "information and knowledge".

In the Malaysian Education System, language planning and implementation has pass through many stages. Hassan (2005) states that firstly, The Barnes Committee was formed in 1950 to explore the needs of Malay Education. It, however, did not achieve the objectives for Malay schools as it needed to involve the entire education system (p. 6). Hassan (2005) points out that this was then followed by the Barnes Report in 1950, which came up with a proposal suggesting that all existing schools be categorized as National schools which includes all children regardless of their ethnic groups. Malay language would be first taught to them, followed by the English language. However, the Chinese and Indians were against the principle as they found that their native language and cultural identity were put in the back seat (p. 6).

As a result, the Fenn-Wu Committee was set up in 1952 to investigate the Chinese schools. It revealed that most of the Chinese agreed with the Malay language and the English language as the medium of instruction, although the Chinese language

will be learnt at the same time to preserve their culture and identity. In this case, the Indians also agreed with the idea. Eventually, the Fenn-Wu report was opposed as the Malays found no recognition on their "status as Bumiputera" and not much priority was shown on Malay rights and needs (Hassan, 2005, p. 6).

However, this scenario came to a change with the implementation of The Razak Report of 1956 and the Rahman Talib Report of 1960. It was the most fundamental agenda in our country's Education policy which propagate towards modern Malaysia (Hassan, 2005, p. 6).

According to Hassan (2005), The Razak Report of 1956 made two suggestions, firstly, that bilingualism will sustain in primary schools and secondly, all schools should adhere to one standard curriculum content. The Malay medium schools were classified as National schools, whereas schools which use English, Mandarin or Tamil were classified as National-Type schools. Both National Schools and National-Type schools use the same curriculum in order to inculcate values and harmony resulting in an integrated nation. The objective of implementing Malay medium secondary schools was to promote unity under the roof of one national system and Malay was selected as the medium of instruction (Hassan, 2005, p. 6).

Hassan (2005) concludes that The Rahman Talib Report of 1960 was the stepping stone towards the implementation of the Malaysian Education Act in 1961. This was then implemented as the National Education Policy in 1979 and Bahasa Malaysia was selected as the medium of instruction in the Education System (p. 7).

According to Gill (2006), Malaysia has undergone "a language shift during two different periods" which is "the post independence period of the 1960-1980" which brought a shift from English to Bahasa Malaysia and "the knowledge economy period of the 1990s and the 21st century" with the abrupt change from Bahasa Malaysia to

English in the medium of instruction for the teaching and learning of Science and Mathematics (p. 3). This change in policy was for the purpose of obtaining knowledge and information to bring development for the nation. Gill (2006) terms this scenario as "linguistic nationalism" which was centered on Malay as the medium of instruction to "knowledge-driven nationalism" on the change towards English as the medium of instruction (Change in Language Policy in Malaysia: The Reality of Implementation in Public Universities, p. 4) .

1.3 Reactions Towards the Change in the Medium of Instruction for the Teaching and Learning of Science.

In 2005, the first batch of *Penilaian Menengah Rendah (PMR)* candidates in Malaysia studying Science in English since the policy was first implemented in 2003, resulted in only one-third of the overall candidates using English when answering their exam questions. This was reported in a Malaysian renowned daily tabloid, *The Star*. Only 33% from the total number of PMR candidates in 2005 answered the Science exam paper in the English language. It was also reported that candidates from the urban area were able to answer in English whereas candidates from the rural areas were more prone to use Bahasa Malaysia (The Star, "Students still prefer to use Bahasa", 2005, p. 14).

The following year, 2006, *The Star* reported that the second batch of PMR candidates studying Science in English and who took the exam bilingually, showed that "less than a quarter of the PMR candidates, which was 24% answered the Science and Mathematics papers in English compared with one-third in 2005". It is reported that 46.3% from the total PMR candidates answered in Bahasa Malaysia and 29.7% attempted bilingually. However, Datuk Dr. Ahmad Sipon, the Education Director-

general said that it was still too early to make justification and evaluation of the National Policy in teaching Science using English language (The Star, “Fewer answer Maths and Science in English, 2006, p. 16).

In a news report of the *The Star* (2005), it was stated that although the change in policy to teach Science and Mathematics in English has sustained until the fifth year since its implementation in 2003, many teachers declined to teach Science and Mathematics in English. The reasons were due to lacking in confidence, the belief that the system will switch back to Bahasa Malaysia and that the exams can be attempted bilingually by students (The Star, “Many still refusing to teach in English”, 2007, p. N8).

One effective step that has been recommended in the teaching and learning of Science in English is by applying the Self-Directed Approach. This has been suggested in *The Star* newspaper by a freelance writer (Cheng, 2007, p. N43). She adds that though teaching Science in English is a positive move in order to fulfill a “knowledge-based economy”, however, more time and effort is needed in making it a success. She argues it is due to diversion factor from 'content-based' to 'meta cognitive skills' in the global context, which requires “critical thinking, innovative problem-solving skills and communicative skills”(p. N43). She encourages that in the Malaysian context “new instructional methodologies” has to be created for effective teaching and learning of Science in English (Cheng, 2007, p. N43).

A weekly writer in *The Star*, Sidhu, mentioned that although trainings have been planned and implemented by the Education Ministry, teachers were still facing problems in the use of the the target language in teaching Science and Mathematics in English (Sidhu, 2007, p. E9). A few possible factors have been listed out. One factor could be the inability of the students to master the language. Other factors are that some

students prefer using Bahasa Malaysia as the medium of instruction. Furthermore, teachers' efforts were wasted due to students' poor control of the English language. In fact, though the teaching of Science and Mathematics has gone a few years, teachers do not seem to progress or attain language competency to teach Science in English effectively (Sidhu, 2007, p. E9).

The Star also reported that in the UMNO General Assembly held from 5th to 9th November 2007, Umno Youth deputy chief, Khairy Jamaluddin, proposed that Science and Mathematics Examinations in English "be deferred for two years". He claims it is because of the "methods" of teaching the subjects in English that need to be adaptable to rural area children's ability. This is because of the poor command of English among rural children. Furthermore, the delegates at the Umno general assembly also voiced out that Malay students were reported to face problems in learning Science and Mathematics in English and this has eventually resulted in a bad performance. Therefore, the delegates in the Umno general assembly urged that effective steps be planned out to assure that rural children or weaker students were not neglected in the acquisition of knowledge due to an inability in language skill (The Star, "Switch to English woes to be addressed", 2007, p. N8).

1.4 English for Teaching Mathematics and Science (ETeMS)

In accordance to the shift in the medium of instruction for Science and Mathematics in English, the English Language Teaching Centre, Malaysia (ELTC) planned an English language enhancement programme known as English for the Teaching of Mathematics and Science (ETeMS) to train Science and Maths Teachers to teach confidently using English language as the medium of instruction in their classroom.

The Education Ministry website on EteMS (www.gov.edu.my) states that the overall aim of ETeMS is "to enhance the English language skills of Mathematics and Science teachers that enable those to teach effectively using English as the Medium of Instruction" (ETeMS, 2003, p. 1).

EteMS (2003) is planned on the basis that Mathematics and Science teachers who are undergoing the programme have "previous knowledge of content area and the pedagogical skills relevant to the subject" (ETeMS, www.gov.edu.my, 2003, p. 1). The underlying belief is that Science and Mathematics teachers attending EteMS possess a basic command of English language proficiency which they have obtained through their primary, secondary and tertiary education. Therefore, EteMS serves the purpose to further enhance language development of Maths and Science teachers in using English language to teach the content subject effectively and for personal attainment in the field of study. Figure 1.3 shows the three aspects of language development for Science and Mathematics teachers.

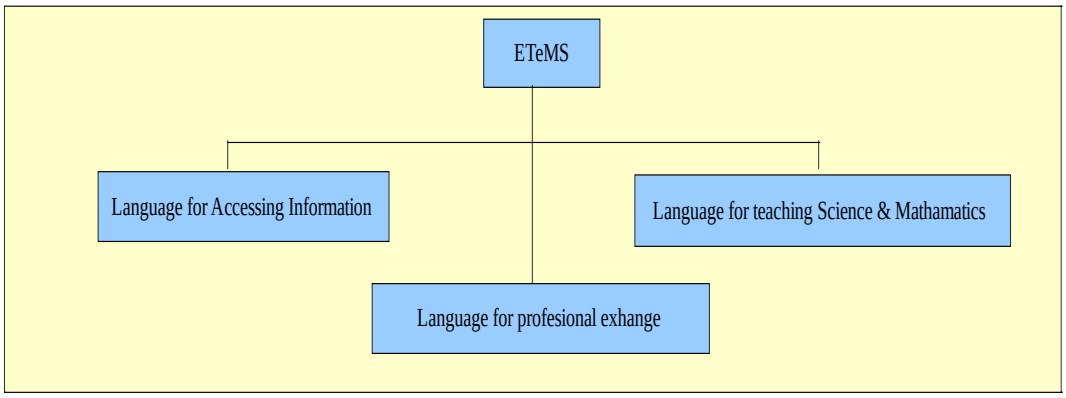

Figure 1.3

Components of ETeMS

(Source : Taken from EteMS, www.gov.edu.my, 2003, p. 1-2)

From Figure 1.3 'Language for Accessing Information' focuses on developing language skills for the purpose of skimming and scanning information in Science texts or readings. 'Language for Teaching Science and Mathematics' focuses on the oral interaction of teachers in the Science classroom and writing skills needed to record Science experiments. 'Language for Professional Exchange' focuses on teachers' self-development in English language in order to communicate with peers and community (ETeMS, 2003, p. 1-2). Therefore, the ETeMS programme can be said to be a full package that supplements the language needs of Science teachers to be able to communicate the Science content in the English language confidently.

EteMS was introduced with the purpose to boost the confidence of Science teachers in using English to teach Science to students. ETeMS is regarded as one of the additional "mechanisms" by the Ministry of Education besides being supported by the "Buddy Support System, resource materials which comprise a self-instructional package for language development in the four skills; reading, writing, speaking and listening, grammar books, dictionary, CD-ROM and a list of web sites for language learning and teaching of Science and Mathematics" (EteMS, 2003, p. 2- 4).

Though the government has taken much effort and emphasis on ETeMS which is to cater to the teaching needs of Science teachers to use English confidently in the classroom, many arguments have been raised on the ETeMS programme. A issue was raised on to what extent does the ETeMS serve the purpose of raising the English language proficiency and help in the acquisition of Science and Mathematics knowledge in English (as cited in Chan, 2006, p. 11). However, to answer the issue that were raised, Former Minister of Education, Tan Sri Dato' Sri Musa bin Mohamad replies that ETeMS serves both the purpose of increasing the English language proficiency of teachers and as a supplement in the classroom to gain knowledge.

However, it is in the “mindsets that need to be changed”. This is because language is essential to express the content knowledge correctly and it is not mere the content knowledge that is learnt in Science but also how it gives an impact in one’s life is also learnt through Science education (as cited in Chan, 2006, p. 11).

The Star (2007) reported that another move by the Ministry of Education was the English Proficiency Test for Science and Mathematics teachers where they were required to sit for a diagnostic test. It was “to gauge the science teachers’ language competency to teach the subject effectively in English” (p. N49). The diagnostic test was held throughout Malaysia on 11 February, 2007. However, this test provoked inquiries as to what extent do teachers effectively use English while teaching Science and Mathematics in the classroom. It was reported that though proficiency in a language is important for teaching a subject, however, by just attempting a diagnostic test and attending an English course will not be a remedy to the plight teachers actually face in teaching content subjects in a language that they did not find necessary although it was taught since their early education (The Star: “Recruit mentor teachers”, 2007, p. N49).

1.5 Statement of the Problem

This study seeks to examine the problems faced by the teachers and students of SMK Bukit Jelutong, Shah Alam, Selangor in the teaching and learning of Science using English as the medium of instruction. According to Kimble and Garmezy (as cited in Brown, 2000, p. 9) Learning is “acquiring or getting of knowledge of a subject or a skill by study, experience, or instruction” whereas Teaching is “showing or helping someone to learn how to do something, giving instructions, guiding in the study, providing with knowledge, causing to know or understand”. In other words, teaching is

for the purpose of facilitating learning and language is used to communicate the content or giving instruction on the lesson that is being taught. Teaching and learning have to be interactive in two ways between teacher and the student.

The researcher is interested in this study as a result of the 'struggle' that Science teachers and students face while teaching and learning science in English in SMK Bukit Jelutong. As far as teachers are concerned, problems arise where Science teachers find it difficult to transmit the Science content in the English language. Bahasa Malaysia seemed to be easy as a medium of instruction for them to express meaning and content of the subject as they have more experience in using this language. The Science teachers in this school feel that the content of the subject should be the focus and not the language that should be given much emphasis in the teaching process. They feel that using English to teach the Science content will need extra time and effort as it involves constructing proper sentences which are grammatically correct, and having a mastery of words or vocabulary and a mastery of scientific terms and their meanings. In fact, Science teachers claim that the four language skills in English: Speaking, listening, reading and writing need to be given much practice before they could start teaching the Science content because of their poor control of the English language. This results in the content of Science being not given much importance or is not the prime focus and much time is spent on the language aspect. This phenomena ends up in the teacher-talk approach which is used widely throughout the lesson. Teachers too tend to be bilingual because they feel the syllabus of the subject should be covered within the time frame given in a day and it should not be wasted on language usage. The lesson turns to be teacher-centered and does not involve any in-depth Science study or discoveries of Science. The researcher finds that chalk-and-talk method, reading directly from

textbooks, displaying science CD- Roms in the Science laboratory and explaining what is written on the screen were much used in the Science classrooms.

Students, on the other hand, learn all subjects in Bahasa Malaysia since primary school, and only learn Science and Mathematics in English. They expressed that learning Science and Mathematics subjects emphasized more on English when they could easily follow in Bahasa Malaysia just like other content subjects in the classroom. Science and Mathematics need much memorizing and understanding of content but since the change in the language of instruction, students claim that understanding the Science lesson which is in English, emphasizes more practical use of the language to understand the content than learning the Science content and language theoretically. This makes them feel even harder to follow the subject. Most students' use of English is for the communicating purpose only. Students with a good command of English enjoy learning in the classroom as they are familiar with a various choice of words in English and sentence structuring. In fact, learning Science in English further helps in learning more scientific words and a better construction of sentences. However, weak students in English tend to ignore the whole learning process as they find the language an obstacle in the understanding of the content when it could be easily understood in Bahasa Malaysia. Since Bahasa Malaysia was used in primary schools and most subjects are learnt in Bahasa Malaysia, the weak students prefer the teaching and learning of Science to be in Bahasa Malaysia. As a result, the weak students show reluctance in the Science classroom as it does not interest them. In fact, the weak students hardly have any learning strategy to study Science in English and rely totally on what the teacher does in the classroom.

Having faced with these problems from teachers and students, in what ways can Science be communicated or taught by teachers to students? What when teachers

themselves are struggling to transmit ideas in a language that they themselves are not familiar with? What strategies or approaches can teachers use in making students engage actively in classroom learning? On the other hand, how can students be helped in developing the language skills they need to deal with the Science content or materials given in class? What strategies or approaches can students use according to their ability in understanding the Science content in a second language?

Therefore, this study intends to find out the problems teachers and students face in the teaching and learning of Science in English which is reaching seven years of its implementation. Looking into the problems faced in the teaching and learning of Science in English, the researcher suggests that Teaching and Learning Strategies be used as an effective method in conveying the content knowledge using a second language. Through the Teaching and Learning Strategies, the teachers or students can adopt the appropriate approaches according to their ability or level of performance to teach or learn the Science content using a second language. The Cognitive and Academic Language Learning Approach (CALLA) formulated by Chamot and O'Malley (1994) is an effective approach for the teaching and learning of Science content in a second language. The CALLA Approach comprises three major strategies which are the Meta Cognitive Strategy, Cognitive Strategy and Social/Affective Strategy which fulfills to students' ability in understanding the content of a subject through a second language. This approach can help Science teachers apply the appropriate strategies to teach the content using a second language based on the language ability and level of understanding of students in different classes. For learners, these learning strategies help them to better understand the content of Science and the language of Science as students adopt the learning strategies that best suit their ability in learning the subject .

1.6 Purpose of the Study

This study aims to obtain information about the problems faced by teachers in teaching Science in English and the problems experienced by students in learning Science in English language. This research also intends to find out the teaching strategies or approaches employed by teachers in the teaching of Science in English as well as the learning strategies used by students in learning Science in English. Finally, teachers and students' feedback towards the teaching and learning of Science in English will be examined.

1.7 Research Question

Given the purpose stated, this study intends to answer the following research questions:

1. What are the problems faced by teachers in teaching Science in English?
2. What are the problems faced by students in learning Science in the English Language?
3. What are the teaching and learning strategies practiced by teachers and students in the teaching and learning of Science in English?
4. What are the responses of teachers and students in the teaching and learning of Science using the English Language?

1.8 Significance of the Study

This study will reveal the problems and feedback of teaching and learning Science in English despite entering the seventh year of the switch in the medium of instruction in teaching Science. The seriousness of problems identified may be a help to the Ministry of Education to find ways to overcome them. In this way, learning about the problems may help to reinforce the strength of the programme and the teaching and learning may be carried out more effectively. This study would also recommend the use of the CALLA Approach to teach content subjects while using English as the medium of instruction. Teachers may apply the appropriate strategies that suit a learner's ability in accordance to their level of performance while using English as the medium of instruction. For students, they may apply appropriate learning strategies in order to understand the science lesson in English.

1.9 Limitations of the Study

This study is subjected to certain limitations and constraints due to the nature of the study. The sample for this study is based only on one secondary school in West Malaysia that is in Selangor, which is, Sekolah Menengah Kebangsaan Bukit Jelutong, a new school which was established in 2003. Therefore, the study only centers on this school's teaching and learning of Science in English and not to other schools in Malaysia. Only Form Three students were taken as a sample and the study does not include other forms. Students from these classes hail from Bukit Jelutong community which is an urban area and residents in the vicinity of Jelutong community a sub-urban such as Bukit Subang, Kampung Melayu Subang, Subang Perdana and others. The findings from this study may or may not be generalized to other schools in Malaysia.