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DIFFERENT PATHS, SAME DESTINATION: A CASE STUDY OF THE
2002 AMENDMENT TO THE EDUCATION ACT FOR CHINESE
MINORITIES IN MALAYSIA

(Spine title: 2002 Amendment to Edn Act for Chinese Minorities in Malaysia)

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by

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Graduate Program in Education



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of the requirements for the degree of
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ABSTRACT

Different Paths, Same Destination: A Case Study of the 2002 Amendment to the Education Act for Chinese Minorities in Malaysia

In 2002, the Government of Malaysia amended the Education Act. The amendment replaces the use of mother tongue with English, as medium of instruction for Mathematics and Science. Its main objective is to raise the standards of English in Malaysia, in acknowledgement of English language's premier position in global information- technology and trade. However, this amendment of the medium-of-instruction, contravened the rights of the ethnic Chinese minority (as enshrined in the Malaysia's Federal Constitution), in regard to access to education in Chinese. Thus, this study focuses on the effects and implications of the 2002 Amendment to the Education Act for the ethnic Chinese community, through exploring the challenges that the policy pose for Chinese school and education, as well as investigating the responses of the different stakeholders in Chinese community toward the change in education policy. To gain answers to the outcomes that the change in policy had on Chinese education, schools and the community, a case study approach was adopted. Surveys (of students and parents) were used as the main data collection tool, supplemented by discussions with educators and document analysis of textbooks and newspapers. The study concludes with recommendations for improving the planning and implementation of the 2002 Amendment to the Education Act (which is due for a review after 2008), and offers suggestions for future research in education policies for minorities, and particularly, the ethnic Chinese.

Keywords: Language rights, minority education, marginalization, assimilation.

DEDICATION

For my beloved parents

献给我亲爱的父母亲:

Chan Chee Hong 陈志豪 and Yam Foong Lui 任凤女

你们的支持与爱护，把一切不可能都变成可能

For which all is impossible without your loving support

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This long and arduous journey would not have even begun without the encouragement and support of my loving parents. Their unconditional love and unwavering trust was a well of strength for me whenever I came face to face with obstacles in my research.

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CHAPTER ONE: INTRODUCTION

1.1 Background and the site of investigation

In May 2002, the Malaysian Government amended its 1996 Education Act, announcing that from 2003 onwards, English would be adopted as the language of instruction for Science and Mathematics. Traditionally, the ethnic Chinese minority had 'enjoyed' access to education conducted in mother tongue, thus this new policy has literally shaken the ethnic Chinese in Malaysia, causing a ripple effect throughout the whole community. This policy has been in effect for five years and is due for a review in 2008. Thus, its effects and implications for Chinese education and community are still debatable.

1.2 Coming to the research

Sharing the same colonial background and being in such close proximity, I (as a Singaporean) have always been curious about Malaysia, especially the diverging path that it chose (in comparison to many postcolonial countries). It is one of the few postcolonial countries that sought to reduce the role and status of colonial English in the aftermath of independence. Instead of embracing the colonial language, it aggressively pursued a nation-building program that promoted an indigenous language- Malay - as the national and dominant language in all official and formal spheres. In so doing, it hoped to redress historical inequalities arising from British colonization (Deng & Gopinathan, 2006, p.612)

One of the major initiatives under this attempt to redress historical inequalities is the implementation of a bilingual education program, in which the Malay language is promoted as the medium of instruction, from elementary all the way through tertiary education. Colonial English was relegated to a secondary position (Gills, 2005, p.249).

Thus, English-medium schools in Malaysia were gradually converted to Malay-medium or national schools. The quadruple system of schooling (English, Malay, Chinese and Tamil) had slowly disappeared, to be replaced by a parallel systems of schooling –the “national” versus the “national-type” schools, the latter referring to Chinese or Tamil schools for those ethnic minority groups. As the Malaysian Constitution recognizes the linguistic and educational rights of the ethnic Chinese and Tamil minorities, they have the right to use their own language and to have mother tongue education. However, as a minority, the Chinese have always feared that “the majority ethnic group intends to nation-build by assimilating them into the dominant identity of the majority group” (Collins, 2005, p.569). This fear is not unfounded.

In a startling turnabout to its educational philosophy, the Malaysian Government (in 2002) introduced the Amendment to the Education Act. The new policy dictated that the teaching of Mathematics and Science would only be conducted through the medium of English, regardless of the language medium of the schools and, it was to be implemented at all levels (MOE, 2004, p.39). The main aim of the policy was to equip Malaysians with the capabilities (through access to the linguistic capital of English) to achieve economic prosperity in an increasingly competitive and globalized community (Collins, 2006, p.313). It was however, a huge blow to mother tongue education in Malaysia. The ethnic Chinese minority group’s expressive and instrumental rights (which will be described in detail in Chapter Two), that they had so desperately tried to protect, had been infringed upon and revoked (Skutnabb-Kangas, 2006, p.274). Yet, it was a decision into which they had no input and which they could not change. This latest threat of assimilation resulted in a huge overhaul of their school and educational system, so that

changes brought about by the 2002 Amendment to the Education Act, could be accommodated. Some of the challenges that the Chinese-medium schools faced as a result of the new education policy include: education of conceptually challenging subjects (such as Mathematics and Science) are now taught through a foreign tongue; a steady decrease in the use of mother tongue as medium-of-instruction; a dramatic increase in the length of the school day (with the addition of periods and subjects); duplication of lessons (Mathematics and Science are taught both in Mandarin and English). What underlies all these challenges, is the threat of assimilation, in short, the marginalization of Chinese education, identity and culture.

Despite the Malaysian Government's endless proclamations of the effectiveness and advantages of the policy, it did not release any public statistics to support its implementation and the 'said' success of its policy. Public outcry over the possible ill-effects of the policy (especially by the ethnic Chinese minority) from the various segments of the Malaysian community are thus to be expected. As the 2002 Amendment to the Education Act is due for a review in 2008, the struggle over linguistic rights in medium-of- instruction policy would only intensify, and one can only speculate on what the future might hold for Chinese minority education and identity.

1.3 Research Questions

In light of this situation, my research on the 2002 Amendment to the Education Act will focus on the effects the policy has on the Chinese schools and, essentially the Chinese community (educators, students and parents). The following questions are used to guide my research in this area:

1. What are the effects and implications of the 2002 Amendment to the Education Act on the Chinese schools?
2. What are the challenges that the 2002 amendment brings for Chinese schools, educators and students?
3. What are the effects of the policy on Chinese students' learning and academic performance?
4. How do the various stakeholders perceive the policy change and how have they responded to it?

1.4 Significance of the Study

The Chinese minority has been part of the Malaysian community prior to its colonization by the British and Malaysia's independence, however, in many areas, the Chinese minority remains markedly divided from the rest of the Malaysian society. Socially, politically, economically and most of all, educationally, it has remained a somewhat separate entity. Though the ethnic Chinese community comprises approximately a quarter of the population in Malaysia, less than 5% of their population attends national schools (in which Malay is the main medium of instruction) (Nanyang Siang Pau, 16/3/2005, n.p.). Despite the huge numbers of Chinese students attending elementary Chinese-medium schools (or national-type schools as it will henceforth be termed) and, the huge differences between the bilingual education programmes in Chinese national-type schools and national schools, little research has been carried out on Chinese schools and education in Malaysia (as compared to research on bilingual education for the national schools). Thus, a study of the 2002 Amendment to the Education Act provides an opportunity to enhance the understanding of the nature of

Chinese education in Malaysia, and contribute to the existing dialogue on bilingual education for Malaysia's Chinese minority.

Incidentally, most research studies within the field of bilingual education for minorities have focused on minorities such as the Spanish and French within a North American context. Within the few studies that concentrate on the Chinese minority, the majority focused on their experiences in North America, though there has been a Chinese minority in Southeast Asia far longer, with numbers similar to those in North America. As a minority group, they have wielded far greater political, social and economic influence than their numbers indicate. As a consequence of their minority status and their unique position in the economic and political strata, they have always faced discriminatory and assimilatory pressures, especially in the realms of education and language policies.

In Malaysia, the ethnic Chinese minority (as part of their rights granted in the National Constitution) 'enjoyed' certain linguistic and educational rights, despite the prevalence of discriminatory practices. Theoretically, the Chinese minority has access to education (for all subjects, with the exception of the core language subjects of Malay and English) in the dominant Chinese language – Mandarin (a northern Chinese language adopted as the lingua franca and dominant language by China and many countries with a large Chinese presence, as opposed to the different Chinese mother tongues of Cantonese, Hokkein, Teochew etc., of the predominantly southern Malaysian Chinese community) (Ho & Wong, 2004, p.222). As such, the 2002 policy contravenes this linguistic right of the Chinese minority, for it demands that Mathematics and Science be taught in English. Hopefully, a study of the 2002 Amendment to the Education Act with regards to the

ethnic Chinese minority, can raise awareness and offer insights into the relationship of language policy and education for the ethnic Chinese minority in Malaysia, and thereby, provide opportunities for a more enlightened educational environment for minorities in Southeast Asia.

Thirdly, the 2002 policy change is fairly recent and full implementation will only be completed in 2008; thus there is a paucity of research in this area. This historical moment, therefore, offers a timely opportunity to contribute to existing literature on bilingual education in Malaysia.

As well, the two education systems (national and Chinese national-type schools) are vastly different; hence, the policy assumes different forms in the two different systems. The Chinese national-type schools thus faced a different set of challenges, for their experiences with the amended education act differ greatly from those of the dominant Malay group. By bringing to the forefront, the specific experiences of the various Chinese stakeholders with regard to the policy, I hope to provide knowledge that would raise the policymakers' awareness of the challenges and/or oversights in the planning and implementation of this policy, so that they can better respond to current or future challenges that this policy (or a revised version of it) poses for the ethnic Chinese minority in Malaysia, particularly since it is due to be reviewed after 2008. In addition, the insights gleaned from this study, could assist in improving the planning and implementation process for the revision of 2002 Amendment to the Education Act, so that the policy can be a success not only for the dominant Malay community, but for the Chinese community as well.

1.5 The approach

For the purpose of investigating the specific educational policy in relation to a minority group-the 2002 Amendment to the Education Act, a case study approach has been adopted. This approach, according to Cohen, Manion and Morrison (2005), emphasizes investigating and reporting “the complex dynamic and unfolding interactions of events, human relationships and other factors in a unique instance”, making it ideal for obtaining an in-depth description and analysis of the roles, functions and perspectives of bilingual education planning for the Chinese minority in Malaysia (p.181).

In my study, I employed the use of surveys, interviews and document analysis, with the first instrument being the principal data-collecting tool, while the other two are used as supplementary tools. As my goal was to study the implications of the amended education act, I surveyed Chinese students and parents using questionnaires. Their responses allowed me to gather quantitative information on the perspectives and responses of two large groups of participants directly affected by the educational policy. In addition, the informal discussion conducted with two educators not only offered in-depth perspectives on the policy, but also furnished me with information from the third group of participants who were directly affected by the policy.

However, to obtain a holistic understanding of the 2002 Amendment to the Education Policy, I had to ‘cast’ a wider net. I supplemented the primary data I obtained from the surveys and the general discussion, with data acquired from document analysis. To attain data that could yield information on the effects of policy amendment for Chinese schools and education, I drew on data from Mathematics and Science textbooks, newspaper articles and a school climate survey. The documentary evidence helped

illuminate the study, providing both qualitative and quantitative information that not only supplemented the primary data, but also aided in meaningful interpretation of the data collected and the context.

As with all research methodologies, the case study approach adopted for this study is not without its limitations. Due to the utilization of purposive sampling and the particular nature of case study methodology, it is limited in its ability to generalize to the wider population. The case study methodology employed in regard to this research study is intended to yield findings that may offer insights into the issue for both policymakers and researchers working in the field of linguistic rights, minority education and bilingual education, and perhaps help in theory generation in related fields of research.

1.6 Overview of the Study

This thesis has five chapters. The first chapter provides the background and context of the research, outlines the research questions, discusses significance of the study and details the approach undertaken. In addition, this chapter contextualizes the 2002 Amendment to the Education Act- in relation to the ethnic Chinese minority, providing a historical perspective of Chinese education- prior to and after independence.

The next chapter, Chapter Two, reviews current literature on education for minorities. Besides presenting the theoretical framework that underpins the study, it also provides for a contextual understanding of the policy, through examining the political and societal contexts surrounding the implementation of the amended education act. Chapter Three is a description of my methodological journey. In it, I discuss the research methodology adopted and the research instruments that are utilized, followed by a

detailed description of the procedures for the collection of data and data analysis. A brief presentation of the limitations of the study is given.

In Chapter Four, I present the findings for the respective research approaches adopted, and a cross-analysis of the data obtained is carried out. Themes emerging from the cross-analysis of the data are described. For Chapter Five, the main and sub questions are revisited, with insights gleaned from the findings obtained from Chapter Four. Recommendations for improving the planning, implementation and future revisions of the 2002 policy as well as suggestions for future research conclude this chapter.

1.7 The Malaysian Context

Before proceeding to the literature review however, it is necessary to trace the history of Chinese education in Malaysia, so as to provide for an enhanced understanding of the sociopolitical context that gave 'birth' to the 2002 Amendment to the Education Act, and influenced the formulation and implementation of the policy for the ethnic Chinese minority.

1.7.1 Malaysian education under colonial rule

Malaysia is what Fishman would define as a "multi-modal nation", a typical example of countries that have a variety of unrelated languages, each with its own literacy tradition (Watson, 1980, p.144). It has four main languages- Malay or Bahasa Melayu, Mandarin, Tamil and English. According to the Department of Statistics and Economic Planning Unit, the ethnic Malays and the indigenous groups constitute 65.9% of the total population of 27 million, the Chinese 25.3%, Indians 7.5% and others 1.3% (Government of Malaysia, 2005, p.238).

Historically, Malaysia was part of the British Empire dating from the beginning of the 19th century. At that time, the colonial government's major policy was to maintain the legitimacy of the Malay sultanates while incorporating them into the British administration (Pong, 1993, p.246). Hence, in the early days of British colonization, British involvement in education provision and policies was minimal, unlike some of its other territories such as India and Hong Kong. Education was far from universal as the colonial government wanted to prevent "overeducating the natives" (Eng, 2003, p.2). They feared that an educated local population might give rise to demands for equal rights and independence, creating unrest and threatening British sovereignty (Patke, n.d, p.1). Its policy on limiting education led to great diversity in schooling and education, especially when Malaysia or Malaya (as it was called then) was a multi-ethnic territory. Since early in the 19th century, Chinese and Indian immigrants had arrived in the area in droves because of the British practice of shipping in massive numbers of cheap Indian and Chinese labour. Prior to the arrival of the British, Chinese communities in both Malaya and Borneo were already well established. The influx of foreign labourers drastically altered the ethnic makeup of the colony (which was then dominated principally by the Malays and the local indigenous people) and greatly facilitated the British policy of divide and rule (Chandler, 1992, p.148). Thus, in colonial Malaya, there were four different language medium schools- English-medium, Malay medium, Chinese-medium and Tamil-medium schools. The educational experiences of each ethnic group were (and still are) hence distinct from the other.

The English-medium schools (set up by missionaries) and located in the urban centers, were an attractive alternative to the Malay, Chinese and Tamil schools. The

pupils were mainly ethnic Chinese, although Indians and Eurasians were also represented. There were few ethnic Malays in English-medium schools because of the schools' urban location and also because many of them were Christian mission schools. The ethnic Malays, being Muslims, were naturally suspicious of the teachings and doctrines of the schools. The lack of a Malay presence in English schools helped create an English-speaking elite that effectively excluded the Malays (p.148). Nonetheless, English-medium schools had more of an inter-racial character compared to the other medium schools (Tan, 2005, p.52). In addition, the large subsidies given to them by the colonial government ensured adequate facilities for teaching and administrative purposes (David & Govindasamy, 2007, p.60).

Malay-medium schools, which had a largely homogeneous Malay student population, were mostly found in rural Malaysia. They, compared to other language medium schools, were accorded special status by the colonial government as the British acknowledged the Malays' status as the indigenous people of Malaysia. Consequently, the colonial government had a policy of non-intervention in the Malay way of life (for the 'protection' of the 'original' owners of the colony). The colonial government set up Malay-medium schools in the villages and until World War 2, provided a four-year primary education to teach the basic skills of reading, writing and arithmetic in Malay, in addition to practical skills in agriculture (Pong, 1993, p.246).

Being perceived of as sojourners by the colonial government, no attempts were made to provide education for minority Chinese and Indians. Fortunately for the Chinese community, they had strong support from an economically thriving Chinese society, and Chinese schools grew and thrived under a *laissez faire* attitude adopted by the British

colonial government. The first Chinese schools in Malaysia, were informal “family” or “neighbourhood” schools that were established in the second decade of the 19th century in Penang, Malacca and Singapore, the earliest centers of Chinese immigration (Palanca, n.d, p.4). The establishment of the first formal Chinese schools in the early 20th century, signified the transition of the Chinese from being transient residents to a more permanently settled community (p.5). Many of these formal schools employed teachers directly from China and followed the Chinese syllabus. Students who required higher education, such as post-secondary education, usually had to pursue it in China (Powell, 2002, p.230). However, the takeover of China by the Communist Party meant that going back to China was restricted. The political turbulence in China caused the British government to become wary of Chinese nationalism and it sought to limit Chinese-medium education, through cutting support for Chinese schooling, and monitoring Chinese schools. It is apparent that the development of the Chinese schools up to the fifties resulted from immigration patterns and the policies of the colonial government (p.4)

Similarly, the Indian population did not obtain any funding from the colonial government for their schools. Most Indian schools too employed their teachers directly from their homeland (India) and those who wanted to pursue higher education, had to do so in India. In contrast to the Chinese-medium schools however, the Indian community, which consisted largely of plantation workers, did not have the financial resources to provide the much needed facilities and resources for the Tamil schools (David & Govindasamy, 2007, p.61). Nonetheless, the Indians (probably as a result of their experience with British colonial rule in India) have the highest number of students

pursuing an English-medium education and, consequently, were well represented in the British administration.

Under the colonial system, the majority of the Chinese and Indians who lived in urban areas, gained a valuable foothold on social and economic mobility because they surpassed the Malays in access to schooling (Agadjanian & Liew, 2005, p.216). The effect of such an education system, or lack of system, was socially divisive, accentuating racial, linguistic and cultural differences, as well as the gap between the rich and the poor (Tan, 1997, p.2).

1.7.2 Malaysian education post-independence

This situation in education and schooling continued until Malaysia's independence in 1957. More than 10 years prior to granting Malaysia full independence, the British proposed formation of a Malayan union that would ensure equal rights for Malays, Chinese and Indians. The numerically greater Malays who perceived themselves to be the natural "sons of the soil", strongly resisted the scheme. They were determined to protect their interests and to prevent the economically dominant Chinese from gaining control of 'their' nation. Thus, the United Malays National Organization (UMNO) was formed in 1946, and subsequently, it dominated the Malaysian political scene and government. To counteract the Malay dominance, the Chinese and Indians formed the Malaysian Chinese Association (MCA), and the Malayan Indian Congress (MIC) to protect their interests (Chandler, 1992, p.149). At times, all three parties worked together to protect their interests from opposition parties. At other times, the three parties fought to protect their own interests.

Since its independence in 1957 and particularly in the period since 1969, the predominantly Malay government (under the dominant political party-United Malays National Organization, UMNO), passed legislation to institutionalize the ‘special position of Malays’, and their special rights in the Independence Constitution of 1957 (Freedman, 2001, p.416). The Constitution recognized the Malays as the ‘original’ inhabitants of the land and in turn, granted them special privileges and ‘protection’. In formulating a Constitution for an independent Malaysia, the Chinese and Indians minorities had to ‘bargain’ hard with the dominant Malays. Despite their dismay at how Malay rights were favoured by the legitimization of the primacy of Malay rights within the Constitution, they were willing to compromise on this issue in exchange for concessions on citizenship eligibility and moderate protection of Chinese and Indian education and language (Abdullah & Chan, 2003, p.416). The Chinese and Indians were ‘allowed’ to become citizens of the independent state but they had to acknowledge *Ketuanan Melayu*, or Malay dominance, which implied that they had to accept ‘special Malay privileges’ as enshrined in the Constitution, and Malay royalty as their rulers, Islam as the official religion, and the Malay language as the official language of the new nation-state (Shamsul, 2001, p.364).

Under Malaysia’s Federal Constitution Article 152, Section (1) & (6), *Bahasa Melayu* (the mother tongue of the ethnic Malays) was selected as the “national language” of the country, and it is to be used for all “official uses”, that is to say, for “any purpose of the Government, whether Federal or State, and includes any purpose of a public authority” (Abdullah & Chan, 2003, p.103). The Malays felt strongly that the institution of *Bahasa Melayu* as the national language, its legislation as official language and its

development as the language of knowledge were vital to provide it with educational, economical and political capital that would lead to its development as a language of higher status. Hence, having mastery of Bahasa Melayu would equip the Malays with linguistic capital, greater economic opportunity, and in turn, lead to social and professional mobility. Bahasa Melayu's status has not only been elevated by the Constitution, but the domains of its functions and its sanctity have also been outlined, following independence from Britain. In line with the Federal Constitution, the Malaysian government implemented a language policy aimed at developing and promoting the national language, making it now the majority language in Malaysia. In so doing, the social and economic imbalance between the Malays and the Chinese and Indian minorities would be rectified (Gills, 2005, p.34).

As mentioned earlier, based on the 'bargain' made with the Malay majority, the other minority languages of Mandarin and Tamil, are 'protected' by Article 152 of the Constitution, which stipulates that "no one may be prohibited or prevented from using (except for official purposes) any other languages for teaching and learning" (Ho & Wong, 2004, p.222). After a considerable amount of contestation and negotiation between the Malays and the minorities, the Mandarin and Tamil languages have been allowed to grow and flourish under the national-type schools (usually private) set up by their own communities in which the language of instruction is Mandarin or Tamil (Haque, 2003, p.255).

Since independence, a number of preferential policies have been implemented to give special treatment to Malays in education, employment, and access to ownership of assets. Four policies relevant to the study of educational inequality : (1) the National

Education Policy, (2) the Education Act of 1961, (3) the New Economic Policy, implemented in 1971, and (4) the Education Act of 1996 (Pong, 1993, p.247).

Based on recommendations of the Razak Education Commission in 1956, the Government implemented the National Education Policy. The Razak Report recommended:

- a. making the Malay language a qualification at the various levels of entry into the government service;
- b. using the Malay language as a factor for selection for secondary education;
- c. making the Malay language compulsory in all government departments;
- d. making the Malay language a requirement for anyone aspiring to a scholarship from public funds;
- e. varying grants to schools depending in part on the successful learning of Malay as and when the adequate facilities could be provided;
- f. making the Malay language a compulsory part of teacher training courses and examinations.

These recommendations were taken up and implemented in the National Education Policy (Gaudart, 1987, n.p.). The National Education Policy also stipulated that Bahasa Melayu become the medium of instruction in schools (targeted at secondary and all higher education institutions). The aim of this policy was to build a national identity and promote integration within the Malaysian society (Ibrahim, 2007, p.161). To achieve its aim, it tried to remove the identification of a particular ethnic group with school achievement and reduce the inequality of opportunity among ethnic groups (Gills, 2005, p.34).

The assimilative goals of the Malay dominant government and the threat it posed to minority education can be found in the Rahman Talib Report of 1960, from which the 1961 Education Act originated. Although the Talib Report reiterated the nation's stand for bilingual education, it was more explicit as to the type and features of bilingual education it considered desirable. It also made it clear that primary education in all four languages should not be continued into secondary schools (Gaudart, 1987, n.p.). The Talib Report also recommended that Bahasa Malaysia should become the medium of instruction in secondary schools and universities. The Talib Report, however, ominously noted that while Chinese-medium (or national-type) primary schools would be tolerated, it was "for the time being" (Gills, 2005, p.34). In the Education Act of 1961, this sense of temporary status for the Chinese primary schools appeared to be confirmed by Clause 21(b), which gave the Minister of Education the authority to change the language of instruction in all primary schools to Malay (Collins, 2005, p.574). The Education Act of 1961 also ended any ambiguity over the language of instruction in Chinese secondary schools. In order to gain acceptance into the national system, and therefore continue to receive government funding, the schools have to convert from Mandarin-medium to Malay-medium of instruction (p.575).

The formulation of the New Economic Policy (NEP) in 1971 strove to allay the frustrations and fears of the Malaysian majority in particular, through a two-prong strategy for a twenty-year period (1971-1990): a) to eradicate poverty irrespective of race and b) to restructure the Malaysian society so that ethnic origin is not identified with economic function and geographic location (Ong, 2004, p.3). Politically, the NEP tried to "concretize the concept of 'Malay supremacy' which is enshrined in the Constitution,

thus assuaging the discontent the Malays had regarding their generally lower social and economic position” as opposed to the non-Malays (Palanca, n.d, p.13) Under the NEP, preferential policies for the Malays were accelerated and extended, with Malays obtaining special treatment in the areas of education, employment, and access to ownership of assets. In regards to education, one preferential policy legitimated quotas for Malay students in higher education. Although the actual quota has never been publicly revealed, Tzannatos estimated that the target share of Malay students was initially set at 75 percent in the early 1970s (as cited in Haque, 2003, p. 252) . According to Mah (1985) and Booth (1999), the percentage of Malays from an initial 21% in 1964 rose to 72.7% in 1999, whereas the percentage of Chinese students and Indian students dropped from the initial 60% and 19% to a combined 27.3% for non-Malays in the University of Malaya (as cited in Haque, 2003, p.252).

Another preferential policy reserved the majority of governmental scholarships for Malay students entering Malaysian universities. In addition, the government refused, for employment purposes, to recognize academic degrees from several universities in Taiwan and India where many Chinese and Indian students receive their degrees. With these channels of higher education blocked, non-Malay students who could not gain entrance to Malaysian universities began to seek more expensive alternatives in countries such as USA, Australia and the United Kingdom (Pong, 1993, p.247). This policy further strove to marginalize minority education and promote assimilation into dominant language and society.

The Second and Third Malaysian Plans (formulated to chart and direct the direction and progress of Malaysia) attempted to close the ‘gap’ between the different

types of schools. The plans also reiterated the need for a national identity and saw this as involving the formulation of educational policies designed to promote common values and loyalties among all races. A way to achieve both equality of educational opportunity and the attainment of a national identity was, the implementation (in stages) of Bahasa Malaysia as the main medium of instruction in schools (Gaudart, 1987, n.p).

A fourth policy that had implications for the existence and welfare of minority education and schools was the 1996 Education Act. A section of the 1996 Act highlights the national language (Malay) as a main medium of instruction even though this reference was not included in the 1961 Act, causing great concern for the Chinese minority. Section 17(1) of the 1996 act states that the main medium of instruction in all educational institutions; except for national-type schools established after 1996 or other educational institutions exempted by the Minister of Education, shall be the national language (Segawa, 2007, p.39). This implies that the national language may be used as a medium of instruction in every educational institution and provides the government with the legal right to terminate education in non-Malay medium.

It is evident that the policies described above were formulated with little or no regard for established social patterns or the interests of its antecedents. In these situations, the interests or “voice” of the minority groups are often overlooked in the pursuit of “greater good” of the dominant group (Chandler, 1992, p.21). The Chinese minority group, in this case, is marginalized through a legalized erosion of their educational and cultural position (besides economic and political position). The policies often exacerbate rather than reduce the tension between the various ethno-linguistic groups.

In Chapter Two, selected literature regarding minority education, and pertinent to the understanding of my study and its findings, will be reviewed.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The literature on education for minorities is vast, especially in regards to North American and European contexts. There is considerably less research on minority education for the Asian context however, especially as pertains to postcolonial Asian countries. In this chapter, I focus on reviewing selected minority education literature that I believe to be pertinent to the understanding of my study, given the unique characteristics of the country on which this study is focused. The chapter is organized into two major sections. The first section presents the theoretical framework that underpins the study. First, the link between language and minority identity is presented, framed within the larger context of nation building. The continued survival of minority languages (and in turn, ethnic minority identity) is often dependent on the rights of the minority groups and the language policies implemented by the dominant group. Thus, a discussion of minority language rights and education policies in school will be undertaken. The second section provides for a contextual understanding of the topic under study. It examines the political and societal contexts that led to the implementation of the 2002 Amendment to the Education Act. An overview of the policy is provided, followed by a discussion of the various responses to the implementation of the policy. In short, the first section covered the following topics, a) language and identity, b) language, nation-building and national identity, c) language rights, d) medium of instruction policies, e) bilingual education for minorities, and f) education in mother tongues. Meanwhile, the second section comprises of the following a) Malaysian education post-independence, b) contextual background on schooling system in Malaysia, c) background

of 2002 Amendment to the Education Act, d) 2002 Amendment to the Education Act and Chinese national-type schools, and e) response of the different ethnic communities to the amendment in policy. The literature concludes with a short analysis of the 2002 Amendment to the Education Act's implications for the Chinese minority in Malaysia.

2.2 Language and Identity

As Baker (2006) states in his study, language is an important symbol of national identity and helps to create a consciousness of “belonging to an imagined separate people, located in a defined territory, bound by a belief in a common culture and history, with common institutions and desiring to achieve or maintain political autonomy” (p.83). In a multiethnic society especially, language assumes an even more important role in gaining and sustaining group cohesion for the purposes of creating a national identity and common consciousness. According to some, a common language provides common attitudes, aims and values, in short, a common language and culture cements society (p.218). However as Collins (2005) states, “When a group forms a minority within a state's population, it may fear that the majority ethnic group intends to nation-build by assimilating them into the dominant identity of the majority group” (p.569).

Concerns about preserving their particular identity, from perceived external threats, often elicit in minority ethnic groups a desire to maintain their languages and cultures, in addition to achieving a measure of political self-determination (Chandler, 1992, p.21). Consequently, “illiteracy of resistance”, as proposed by Wagner in his study of minority francophones' responses to oppressive societal institutions, could occur (as cited in Van Deven, 2006, p.42). As described by Wagner in Van Deven (2006), illiteracy of resistance is, to an extent, instituted by the minority ethnic group itself, “wishing to

safeguard its language and culture, and fearing assimilation, turns in on itself and rejects the form of education imposed by the majority group” (p.41).

Alternatively, some researchers maintain that minority ethnic groups would often agree to change and adapt if they believe that their interests have been taken into consideration and are being served (Chandler, 1992, p.22). However, when they perceive that their interests have been ignored and they have not received fair treatment from other group or groups (usually the dominant group), they are generally resistant to change. In short, assimilation or integration of the minority ethnic groups could occur during their quest to achieve structural incorporation (to be treated as equals, with the same rights and duties, economically, politically, socially, educationally etc.) when faced with assimilatory or integration pressures (Skutnabb-Kangas, 2000, p.125). In such cases, it is usually the dominant culture that is ‘glorified’, while the minority ethnicity or culture is not valued. This ‘consent’ to change and adapt (i.e. assimilate) to dominant culture and language is thus ‘manufactured’ by assimilatory pressures, and not voluntary. Often, ethnic minority groups are forced to assimilate through the ‘stick and carrot’ approach. In addition to or instead of using the stick approach (physical violence, threats, sanctions and control over material resources), the dominant group has increasingly adopted the ‘carrot’ approach (rewards, bargaining, gratification), mediated through ideological and psychological means (such as persuasion, shame, ideas of traditionalism and uselessness, and positive reinforcement in relation to dominant culture and languages etc) (p.130-1). In such situations, “illiteracy of oppression” (a direct consequence of the process of assimilation or integration at work) usually occur, in which the minority ethnic group’s identity and means of resistance are often slowly destroyed (Van Deven, 2006, p.42). To

quote Skutnabb-Kangas (2000), “The world’s minorities are increasingly being ruled and controlled hegemonically, with their own (partial) consent” (p.202).

Despite giving out strong assimilatory pressures, the dominant group may seek to prevent structural incorporation (at the collective level) and assimilation (at the individual level) at the same time by not allowing individuals from minorities to ‘pass’ into dominant culture and society. A conflicting message is thus given out, “In order to get your share of the goods, services and power of this society, you have to become like us – but we won’t allow you, because you are not one of us” (p.125). To summarize, as language is one of the most important cultural values for most ethnic groups, “a threat to an ethnic group’s language is therefore a threat to the cultural and linguistic survival of the group and thus, to its existence as a group, a people” (p.436).

The above literature on the relationship between language and minority identity serves to contribute to an understanding of the factors underlying the Chinese community’s rationale and continued demand for Chinese education in Malaysia. In turn, the interacting dynamics will ‘colour’ the perspectives and attitudes of the various stakeholders in Chinese vernacular schooling towards the new 2002 Amendment to the Education Act.

2.3 Language, Nation-building and National Identity

Minority languages represent important markers of ethnic identity, but the maintenance of ethnic identities has often been seen as contrary to the unity of the nation (Baker, 2006, p.83). This view, based on the “language as a problem” orientation, is a widespread belief among many newly independent or developing nations with a multi-ethnic population. The “language as a problem” orientation argues that “perpetuating

language minorities and language diversity may cause less integration, less cohesiveness, more antagonism and more conflict in society” (p. 384). To “language as a problem” proponents, language diversity is an obstacle to the implementation of a nation’s social and political reforms, and hinders the pace of economic modernization (Chandler, 1992, p.36). Thus, for these newly independent or developing countries, the outcomes of language diversity (as stated above in the “language as a problem” argument) are contradictory to the goals of nation-building (as characterized by political, economic and social stability) which they are aiming for. Nation-building, as defined by Bell and Freeman, is “both the establishment and formation of the new state itself as a political entity, and the process creating viable degrees of unity, adaptation, achievement, and a sense of national identity among the people” (as cited in Chandler, 1992, p.43). A crucial step to forging a national identity, from among the many different ethnic identities, is to create a common culture, through imposing a common language (usually the dominant language). As Kee (1971) puts it, nationalists believe that “of all the elements of culture, language is one of the most effective instruments for integrating a heterogenous community” (p.73). In view of nation-building efforts to engender a common consciousness, May concludes “any public recognition of the rights of ethnic, linguistic, and cultural minorities to maintain their distinctiveness has been seen as a threat” (as cited in Skutnabb-Kangas, Phillipson & Kontra, 2001, p.149). Echoing May’s sentiments are Huntington, Lasch and Schlesinger, who further warns of the serious implications of linguistic and cultural diversity on nationhood and national identity. They believe that multilingualism and multiculturalism would lead to national collapse through causing ethnic upsurge and national disunity (as cited in Segawa, 2007, p.34). Thus, attempts

have been made by governments (that espouse a “language as a problem” orientation) to eradicate the minority languages or restrict the domains in which they are used, and instead establish the majority languages in their place, by means of education and compulsory use of the majority language in public and official life (Baker, 2006, p.83). These “nation-building” strategies listed above and, adopted by many newly independent and developing countries, emphasize language planning which “preludes dialogue between dominant or majority language groups and minority language groups, focusing on using a common language, practicing a common faith, and obeying a common law as the glory of the modern nation-state” (Chandler, 2007, p.24)

Contrary to the language as a problem orientation held by most newly independent or developing countries, some academicians advocate for a “language as a resource” orientation towards nation-building. Underlying this orientation is the belief that linguistic diversity does not cause disunity or less integration in a society or nation. Rather, national unity and linguistic diversity can co-exist and, with cooperation and tolerance between different linguistic groups, the linguistically diverse environment can be turned into an advantage. Instead of the economic, social and cultural wastage from suppressing minority languages, the diverse languages become a national resource that can be “exploited for cultural, spiritual and educational growth as well as for economic, commercial and political gain” (Baker, 2006, p.391). It is evident that most “language as a resource” proponents have reduced language to a mere economic commodity, which when used to one’s advantage, provides access to goods and services. As such, unity in diversity can thereby be an effective tool for national integration (Segawa, 2007, p.34). As Choy, Cooper and Kelman conclude, language can become a major source of

disintegration if abused, yet it also has the potential to be a powerful tool for the “integration of a linguistically diverse population” (as cited in Chandler, 1992, p.43).

2.4 Language Rights

A third orientation to language is the “language as a right” orientation, which views language as a basic, human right (Baker, 2006, p.386). According to Phillipson & Skutnabb-Kangas, language rights are one type of human rights, part of a set of inalienable, universal norms for the just enjoyment of one’s civil, political, economic, social, and cultural rights (as cited in Paulston, 1997, p.81). There are two components to a description of language rights, the expressive (or non-instrumental) versus the instrumental. The expressive language rights, according to Rubio-Marin, aims at “ensuring a person’s capacity to enjoy a secure linguistic environment in her/his mother tongue and a linguistic group’s fair chance of cultural reproduction” (as cited in Skutnabb-Kangas, 2006, p.274). In contrast, instrumental language rights sought to ensure that language is not a barrier to the effective enjoyment of rights within a linguistic domain, to meaningful participation in public institutions and democratic process, and to full access to social and economic opportunities that require linguistic skills (p.274).

On an individual level however, language rights means that people can “identify positively with their mother tongue and have that identification accepted and respected by others whether their mother tongue is a minority language or a majority language” (Skutnabb-Kangas, 1994, p.625). It also means the “right to learn the mother tongue, orally and in writing, including at least basic education through the medium of the mother tongue, and to use it in many official contexts” (p.625) On a collective level though,

language rights imply that minority groups have the right to enjoy and develop their language, which entails the right to establish schools and other educational institutions, with control of curricula and teaching in their own languages. Essentially, language rights are rights to protection and rights to participation.

Often, struggles over language rights ensue when minority ethnic groups perceive their identity to be threatened and that they are in danger of being assimilated.

Consequently, some minority groups will attempt to legitimize themselves and alter their relationship to the dominant society/ state. They will start demanding their rights (both language and otherwise), mobilize as a group through stressing “the importance of the mother tongue, as a necessary (often primordial) bond between the group’s members, and between the group and its history and culture” (Skutnabb-Kangas, 2000, p.640). Those minority ethnic groups whose demands for language rights have not been met, or are not even in the position to make such demands, have often been forced into either multilingualism (coerced into learning the dominant group’s language in addition to their own) or into monolingualism (in which the dominant group’s language has replaced their mother tongue). As a group, they therefore have less power than those whose mother tongue is officially recognized. The lack of linguistic rights often prevents a minority ethnic group from achieving educational, economic and political equality with other groups. In addition, inequalities arising from failures to respect language rights are one of the contributing factors to inter-ethnic conflict (p.43).

The above two segments of the literature present the various orientations that underpin the language planning decisions implemented by governments. Awareness of the issues underlying the decisions helps promote understanding of the factors behind the

implementation of the 2002 Amendment to the Education Act and the subsequent, 'unintended' challenges for Chinese education and identity in Malaysia.

2.5 Medium of instruction policies

Given that linguistic rights are not enjoyed by all minority ethnic groups, languages in societies have varying status, leading to the constitution of linguistic hierarchies (Lindgreen, 2000, p.40). Thus minority ethnic groups, defined on the basis of their mother tongues, get unequal access to power and resources e.g. educational, economic and political etc.

Education is perceived, by both dominant and minority groups, to be the gateway to accessing valued resources in today's society and in modern nations, educational attainment has been linked to social and economic well-being of individuals and groups. Thus, to ethnic minority groups, education is especially crucial. Education not only affords them an opportunity for their 'voices' to be heard, it also acts as an 'equalizer', redressing the imbalances arising from societal inequalities. For this reason, education is especially politicized in nations of pronounced social inequality (particularly in those with multiethnic and multilingual communities), because, equality of education, among other things, is integral for social equality.

In addition, some governments ascribe to the "language as a problem" orientation, taking the position that imposing a common language is one of the most effective strategies to forging a common identity from its multiethnic and multi-lingual community. Language planning thus assumes great importance, in the goal to forge a common identity. Among the many instruments wielded by governments in language planning

exercises, education (in the form of medium of instruction) is one of the most efficient in establishing a hierarchy of languages and prescribing its domains and functions.

Decisions on the language to be used as the medium of instruction in education are thus often more than educational or pedagogical decisions. Underlying these decisions are political, social and economic agendas that aim to protect the interests of particular social, political or ethnic groups (usually the dominant group) (Deng & Gopinathan, 2006, p.614). Medium of instruction policies thus tend to become sites of tensions between competing agendas, as well as an arena where power struggles between different ethnic or interest groups in the community are played out (p.614). These competing agendas and tensions have resulted in certain nations adopting “languages of wider communication” (usually English) as the medium of instruction, while others prefer an indigenous language (usually, the dominant language) or a combination of different languages as medium of instruction (in this case, it could include “languages of wider communication”, ‘vernacular languages’ and/or the mother tongues of ethnic minorities) (Kaplan & Baldauf, 1998, p.358).

Many nations that sought to adopt “languages of wider communication” as the dominant medium of instruction instead of the vernacular languages of its people, are often newly independent former colonies. The rationale behind such decisions are often due to instrumental and pragmatic reasons. The “language of wider communication” often serves either one or both of the two main purposes, namely a) to nation build in terms of economic capacity to compete in the global marketplace (through imparting the skills and knowledge needed for economy-building by virtue of its linguistic capital) and b) to forge a common language among a multiethnic population

(on the basis of its perceived 'neutral' quality as it is not the mother tongue of any of the groups, thus offering equal access to resources for all members of the different ethnic groups). The ramifications of adopting "languages of wider communication" as the dominant medium of instruction in postcolonial countries are far-reaching in both spread and depth, encompassing the realms of academic, social, economic and political. Some of the major ramifications are: low academic competency of the indigenous population; the production of socioeconomic stratification; devaluation of the indigenous languages and deculturalisation of the indigenous people. Nations who adopt "languages of wider communication" as the dominant medium of instruction are often trapped, as Thiru Kandiah states in Phillipson (2001), in a major contradiction. On one hand, they require the 'indispensable global medium' for pragmatic purposes - survival in the global economy. Yet on the other hand, the global medium is often not culturally or ideologically neutral. The users of the global medium face the "unavoidable risk of co-option, of acquiescing in the negation of their own understandings of reality and in the accompanying denial or even subversion of their own interests" (p.196).

Alternatively, in some nations, the indigenous language is constituted as the national and official language, as well as the dominant medium of instruction in schools. The few postcolonial countries that promoted the vernacular language as medium of instruction, often sought to do so to redress historical inequalities, through altering the privileged status associated with the colonial languages and thereby, reducing inequalities among the different interest or ethnic groups in the country (Deng & Gopinathan, 2006, p.612). The promotion of vernacular education is also tied to the need for the preservation of local cultures and serves to contribute to the development of traditional cultural values

and social cohesiveness (p.620). Likewise, vernacular education has several implications too, namely: limited access to valued resources; the empowerment of the previously marginalized and powerless; and minority language group's resistance to the dominant vernacular language. From the above discussion, it is evident that vernacular education is expected to perform political functions that are not fundamentally different from those of non-vernacular education. Education is and has always been, wielded as a tool by those in power to serve their interests. It is often politically motivated, and closely linked to issues about local governance (including ethnic management), political stability and social control (p.621).

This segment serves to highlight the dynamics behind the struggle, between majority and minority groups, for control of medium of instruction policies (to serve competing agendas), parodying the historical and current debates on medium of instruction policies in Malaysia. In so doing, it attempts to address the implications of the 2002 Amendment to the Education Act for Chinese national-type schools and Chinese community in Malaysia.

2.6 Bilingual Education for minorities

The use of a "language of wider communication" or a dominant vernacular language as a medium of instruction, however does not alter the reality that education, and medium of instruction policies in particular, have always been wielded as a tool by the dominant group to protect their interests. Studies on minority ethnic groups and their languages often reveal the presence of transitional elements in governments' education policies, which aimed at the assimilation of their minorities. Even bilingual education provided by more 'enlightened' governments, who profess to 'recognize' the rights of the

minorities to learn and use their own language, is often used (by governments) to control and manage the different minority groups in their midst. Bilingual education, as defined by Siguan and Mackey, in its broadest sense, refers to an educational system that uses two or more languages as the media of instruction, one of which is usually (though not always) the student's mother tongue (as cited in Chandler, 1992, p.65). In general, there are three categories of bilingual education: enrichment; transitional and maintenance. Enrichment bilingual education is defined as education in which both the mother tongue of the child (L1) and a second language (L2) are taught. The second language (L2) is acquired at no extra cost to the first language (mother tongue/ L1) and is often acquired for personal benefit or aesthetic reasons (p.67). It also aims to extend the "individual and group use of minority languages, leading to cultural pluralism and linguistic diversity" (Baker, 2006, p.214). According to Paulston, enrichment bilingual education is usually a matter of choice and is the hallmark of upperclass, learned individuals. Thus it tends to be the exclusive domain of relatively affluent individuals and/or societies (as cited in Chandler, 1992, p.68).

Meanwhile, maintenance bilingual education has as its goal, the fostering of the minority language to prevent language loss but does not seek to increase literacy in the mother tongue or minority language (Baker, 2006, p.214). Transitional bilingual education refers to education that aims to shift the child from the mother tongue or minority language to the dominant, majority language. The underlying goal is the social and cultural assimilation of the minority language users into the language majority (p.213). Transitional and maintenance bilingual education are often the result of ethnic groups in contact and are usually involuntary.

As the goal of transitional bilingual education is assimilation into the dominant languages, it is a common feature in education policies for the minorities. In transitional bilingual education programs, competence in only the majority language is developed and the goal is to extend the majority language's use to all major domains (Fishman & Lovas, 1970, p.216). A common feature of such programs is the use of the minority language or mother tongue, in the early grades to the extent "necessary to allow pupils to 'adjust to school' or 'master subject skill' until their skill in the majority language is sufficiently developed to be used solely as the medium of instruction" (p.217). Thus, these programs are often the most prevalent forms for minorities and often lead to the assimilation and integration of minority groups (Housen, 2002, p.398).

The above segment explores some of the literature on bilingual education for minorities, attempting to provide for parallels with the Malaysian education context, so as to aid in an analysis of the new bilingual policy in regards to its goals (intended or otherwise) for minority education and thereby, its effects on Chinese education.

2.7 Education in Mother Tongue

As mentioned earlier, transitional and maintenance bilingual education for minorities often feature in many education policies, especially in nations with a multilingual and multicultural society. Education in mother tongue is a key feature in both types of bilingual education. According to Szepe, mother tongue, a metaphor coined in the West, probably derives from the situation "where the mother is the main source of guidance in a child's primary social adaptation and, therefore, carries a positive connotation" (as cited in Chandler, 1992, p.79). Mother tongue is thus defined as "the language(s) one has learned first and identifies with" (Skutnabb-Kangas, 2000, p.110).

The Hague Recommendations Regarding the Education Rights of National Minorities (1996) states that mother tongue education is recommended at all levels, and particularly, the first few years of education should be carried out in the medium of the mother tongue (p.561). In addition, UNESCO takes the position that it is “axiomatic that the best medium of teaching a child is his mother tongue” (Paulston & Heidemann, 2006, p.298). Though many international agreements and treaties recommend education in the mother tongue for minorities, they are often not binding and have hidden opt-outs and alternatives. Reluctant nations thus tend to either meet the barest minimum of the requirements/recommendations or ‘overlook’ them despite the overwhelming research evidence that shows that mother tongue education is important in improving the condition of the minorities in educational, social, political and economic realms.

Proponents of mother tongue education defend mother tongue education as the best vehicle for educating minorities based on their belief that mother tongue education can ensure the continuance of a minority group’s identity; build a positive self and group image, leading to empowerment, and aid in cognitive development of the minority child. Some scholars believe that the continuance of any given culture is inextricably linked with the continuance of that culture’s language (Chandler, 1992, p.82). These scholars contend that when students from a minority - language group are immersed in majority language instruction, their group culture is threatened and survival as a minority group is thus endangered. This situation, they argue, is tantamount to ethnocide (ie. a dominant culture’s deliberate annihilation of a minority culture) (p.82). Often, when mother tongue education is not offered, the minority group would shift linguistic and cultural ethno-identification. In such cases, a “person has been ‘forcibly transferred from one group to

another”, causing mental harm. According to Skutnabb-Kangas (2000), this is an instance of linguistic genocide (p.353).

A second reason cited by proponents of mother-tongue education for its importance is that it provides children with a strengthened self-concept and the necessary motivation to learn. These scholars claim that minorities are taught to despise their own languages (and culture) when it is not given a place of prominence in the education (Chandler, 1992, p. 83). The basis of their claims rests on the fact that language is probably one of the most important aspects of culture, since language is the primary means by which each of us is enculturated i.e., brought into the individual particular communities of belief and behaviour. Thus for many minorities, the use of their mother tongue in schools is empowering as it validates their culture. It also functions as an equalizing mechanism as it provides equal access to the curriculum. When schools develop and maintain students’ mother tongue alongside the dominant language, they enhance students’ capability to function in an increasingly pluralist environment (Lessow-Hurley, 2000, p.23).

A third reason rests strongly on theories and findings from many studies that provide evidence of the importance of mother tongue education in facilitating cognitive development in minority children. Cummins, with other proponents of mother tongue education, argue that children will learn to read in the dominant language or L2 more rapidly and eventually achieve greater general knowledge in an L2 if they are given initial instruction in their mother tongue or L1 (Chandler, 1992, p.80). Findings from many studies (Rosier & Farella 1976, Hanson 1979, Hebert 1976, Edmonton Public School Board, 1979) prove Cummins’ stance that the use of mother tongue (L1) as the

language of instruction builds on the linguistic and intellectual skills which students bring to the school (as cited in Cummins, p21-2). Thus, students are able to benefit fully from interaction with the teacher, and when instruction in dominant language (L2) is introduced, they can use the concepts and knowledge developed in L1 to make L2 input comprehensible. In other words, concepts developed in L1 can be easily transferred to L2, given adequate exposure to L2 either in school or in the wider environment (p.22). The results of Fernandez & Nielsen (1986), Nielsen & Lerner (1986), Garcia (1985)'s study of the relationship between Hispanic students and academic achievement reveals that development of heritage language (together with acquiring English) makes a contribution to school success (as cited in Krashen, 1998, p.8). Hornberger and Baker, inferring from Cummin's developmental interdependence hypothesis, suggests that that the relatively greater success of mother tongue education in minority language situations is due, partly at least, to the fact that certain aspects of the minority child's linguistic knowledge may not be fully developed on entry to school (as cited in Cummins, 2001, p.79). Therefore, some children may have only limited access to the cognitive-linguistic operations necessary to assimilate the L2 and develop literacy skills in that language. Cummins' threshold hypothesis suggests that bilingual children (or minority ethnic children in this case) *must* attain a threshold level of linguistic competence in *both* their mother tongue (L1) and the dominant language (L2) in order to avoid cognitive deficits and allow the potentially beneficial aspects of bilingualism to positively influence her/his cognitive development (Baker, 2006, p.153).

In summary, a lack of proficiency in the mother tongue is often a consequence of the lack of opportunity to use and learn the original mother tongue in institutional settings

(i.e. a result of earlier oppression). The poor competence is often used to legitimate additional oppression (Skutnabb-Kangas, 2000, p.109). To quote from Skutnabb-Kangas, “If a language cannot be used, it will not be learned, and it is difficult to identify with a language one does not know. Not giving languages any official rights is an indirect way of killing them” (p.504).

This segment of the literature serves to outline the various arguments on the issue of mother tongue education, especially as pertains to minorities, assisting in obtaining an informed assessment of the effects of the 2002 policy on the learning practices and educational progress of the minority Chinese.

2.8 Transitional bilingual education in Malaysia for the Chinese population

In comparison with the many studies done on assimilatory or transitional bilingual education for the Spanish minority in United States, there is a scarcity of research on bilingual education for the Chinese minority in Southeast Asia, particularly in Malaysia, where the Chinese (like the Spanish in United States) is a sizeable minority. In addition, Chinese national-type schools have been a constant feature in the Malaysian school system. Research on bilingual education in Malaysia reveals that despite the continuing presence of Chinese national-type schools and the provision of bilingual programs in Malaysia, the various Education Acts (1957, 1961, 1995/6) and education initiatives have all tried to reduce the role of the Chinese minority’s language- Mandarin - in the national education system and to integrate the Chinese minority into the society at large (Collins, 2005, p.573). To the Chinese community, the latest 2002 Amendment to the Education Act is just another of the government’s attempts to assimilate them into the mainstream society.

To examine the relationship between the 2002 Amendment to Education Act and its implications for the minority Chinese education and community, it is necessary to obtain a contextual understanding of the history of Chinese-medium education in Malaysia and the current Malaysian education system.

2.9 Contextual background on schooling system in Malaysia

Post-independence Malaysia has continued to practise linguistic segregation for its schools, a divide-and-rule system inherited from the colonial era, and has basically adopted the 'ideal' of a monolingual school. Whereas education through different languages is the norm in Malaysia, each individual school is mainly operating through one medium and is a monolingual school, except that other languages may be taught as subjects (Tan, 2005, p.49).

The period following independence saw a parallel system of schooling being set up. There are national schools; that use Malay as medium of instruction in almost all subjects (with the exception of the core language subject of English); and national-type schools that use Mandarin or Tamil as the medium of instruction in all subjects (except for the core language subjects of Malay and English). The subjects taught in national-type schools were realigned to converge with the syllabus taught at Malay national primary schools, so as to create a common Malaysian identity. Government funding was provided to these schools as stipulated in the Malay Constitution. Mandarin, as a medium of instruction, is allowed within the national-type primary schools, but not for secondary schools. Most non-Malay medium secondary schools had to convert to national-type secondary schools (as a result of the 1961 Education Act) if they want to be part of the unified system and obtain full financial support. In national-type secondary schools, the

teaching of the minority languages or mother tongues (Mandarin or Tamil) is allowed only if there is a demand from at least 15 parents. There were some Chinese secondary schools (as opposed to the non-existence of Indian secondary schools) that did not convert to national-type schools as they wanted to retain the use of Mandarin as medium of instruction and, thereby preserve Chinese culture and identity. These schools, called Independent Chinese Schools, are thus not recognized by the government, and hence do not receive any government subsidy, nor do their graduates participate in government examinations and thereby, cannot enter Malaysian universities (Palanca n.d, p.1). Thus, on completing their vernacular primary education, a large majority of the Chinese and Tamil students continued their education in national secondary schools where Malay is used as a medium of instruction (and mother tongues are not offered at all). In total contradiction to the situation at primary schools, only 10% of Chinese children attend Independent High (Nanyang Siang Pau, 2/5/05, n.p). The situation in higher education is an extension of Malay as medium of instruction policy as almost all subjects in university are taught in the Malay language (David & Govindasamy, 2007, p.61).

Besides attempting to push Chinese education to the periphery through restricting funding, the number of Chinese schools in the country has decreased steadily since independence. Though there is a rise in numbers of students attending Chinese primary schools (from 439,681 to 654,549 students), there are however only 1284 Chinese primary schools in Malaysia now, as compared to its peak of 1346 in the 1970s. In contrast, national primary schools increased by 1478 schools from 4277 to 5755 while its population increased from 1,046,513 to 2,349,008 (Nanyang Siang Pau, 28/9/2006, n.p)

Despite the marginalization of Chinese education and community within the national education system, a study in 2002 found a very low proportion of non-Malay students in national primary schools. Ethnic Chinese accounted for only 2.1% while ethnic Indians accounted for 4.2% of all enrolled students, well below these minorities representation in the population (Ganesan, 2003, p.151). In addition, there are 60 000 non-Chinese students in Chinese primary schools in 2002 (Nanyang Siang Pau, 18/11/2002, n.p). It is thus apparent from the Chinese enrolment in the different medium schools, that Chinese education is perceived by the Chinese minority group to be a bastion for the preservation of Chinese identity and culture. Consequently, it also acts as resistance to the Malay dominant government's assimilative policies (Segawa, 2007, p.33). The divisive agenda put into practice by the various language and educational policies, served to further polarize a society that is already divided in terms of ethnicity, language and religion.

2.10 Background of 2002 Amendment to the Education Act

After decades of promoting and safeguarding the premier position of Malay as the national and official language, the Malaysia government took a sudden turnabout in 2002. In May 2002, the Malaysian Cabinet announced the use of English (replacing Malay) as the medium of instruction for the teaching of Science and Mathematics, starting from the first year of primary education all the way to tertiary education (See Table 1) (MOE, 2004, p.39). In actual fact, the first attempt to re-institute English as the medium of instruction, was first raised by the former Prime Minister, Dr. Mahathir, in 1993. His intent was to arrest the decline of English standards, a scenario that started with the abolishment of English-medium schools in the 1970s (Nanyang Siang Pau, 8/5/2002, n.p)

However, at that time, the political climate did not really provide support for this suggestion, thus the policy change was not instituted (Gills, 2005, p.37). In May 2002, the then Prime Minister, Dr. Mahathir, raised the idea to switch the whole education system to English again, as a way to respond to pressures of globalisation. His idea was rejected by the Malay- dominant UMNO and they proposed the teaching of Mathematics and Science in English. The proposal was taken up and implemented by the Education Minister, Musa Mohamad (Ibrahim, 2007, p.163). He announced on 11 May 2002, that a bilingual system would be set up with English used for teaching Science and Mathematics. Starting from 2003 as well, the language medium for Mathematics and Science subjects in national examinations would be Malay and English. Students are given the choice of answering the questions in either languages, though after 2008, the language medium would be restricted to English only (Ye & Yu, 2007, p.2-3). The policy change was a top-down decision and was implemented at school level (in a staggered fashion). The change took place within a swift period of six months from the timing of the announcement in the major media to its implementation in the school system (Gills, 2005, p.38). However, the deadline for the full implementation of English medium instruction was set at 2008 (Kee, 2005, p.4).

Table 1: Medium of Instruction in Schools- Pre and Post 2002 Amendment to the Education Act in Malaysia.

School Type	MOI	Exclude	Higher Education	School Type	MOI	Exclude	Higher Education
Malay national school	Malay for all subjects	English as core subject	Malay Language As MOI	Malay national school	Malay for most subjects	English as core subject. MOI in Math and Science in English.	English and Malay Languages As MOI
Chinese national -type school	Chinese for all subjects	English and Malay language as core subjects		Chinese national -type school	Chinese for most subjects	English and Malay language as core subjects. MOI in Math and Science in English and Mandarin.	
Tamil national type school*	Tamil for all subjects	English and Malay language as core subjects		Tamil national type school*	Tamil for most subjects	English and Malay language as core subjects. MOI in Math and Science in English.	
Note: * There are only primary Tamil national-type schools. ** National/ standardized exams are conducted in Malay language.				Note: * There are only primary Tamil national-type schools. ** National/ standardized exams are conducted in Malay and English language.			

From a review of relevant literature, it would appear that the change could be attributed to the following factors: access to resources (i.e. information); high unemployment rate among the Malay graduates and globalization. In the 2004 National Report of Malaysia, it is stated that Mathematics and Science represent the gateway to a world of creativity, innovations and discoveries. The Ministry of Education (MOE) is trying to emphasize the learning of Mathematics and Science because the ‘future’ of the world ‘rests’ upon new breakthroughs and cutting-edge technologies (MOE, 2004, p.10). As the language of Science and information communications technology (ICT) is predominantly English, the decision to switch to the English language as the medium of instruction was based on the rationale that a good command of English would enable students to gain access to much-valued scientific and ICT knowledge resources (p.10).

A second factor would be the high rate of joblessness among the ethnic Malay graduates as compared to non –Malay graduates. Due to the nationalistic policy, the ethnic Malays are largely monolingual as their mother tongue or the national language, dominates almost every domain in the country and, therefore they see no need to acquire competence in a second language. As such, many local companies prefer to hire overseas graduates because they have a higher standard of English (Nanyang Siang Pau, 10/05/2002, n.p). According to the findings of Malaysia’s biggest online job search engine’s – Jobstreet.com’s- online survey of 3300 different human resource managers of various fields, the main reason (56%) cited for refusal to hire local university graduates (mainly ethnic Malays due to the local universities’ discriminatory quota system for non-Malays and the Chinese community’s preference for private and overseas universities) was their poor mastery of English (Nanyang Siang Pau, 1/4/2005, n.p). This lack of competence in English impacts heavily on the ethnic Malays’ ability to procure a job in today’s globalized and increasingly Anglicized marketplace (Gills, 2005, p.251).

Thirdly, official policy had tremendous success in replacing English with Bahasa Melayu as the official language to be used in all government functions and as the medium of instruction at all levels. However, it is not able to control language use in the private sector (including business and industry), especially in view of the pressures of globalization which led to a growing demand for English (p.241).

Basically, the Malaysian authorities’ reason for reintroducing the colonial language as medium-of-instruction for Mathematics and Science is because they believe that it is essential for Malaysians to master English to assure economic prosperity in an increasingly competitive and globalized economy (Collins, 2006, p.313).

2.11 2002 Amendment to the Education Act and Chinese national-type schools

As mentioned earlier, the news of a bilingual language system for the teaching of Mathematics and Science in English was released to the public on 11 May 2002. It was further announced by the Ministry of Education that English would be used as a language medium, besides the current Malay national language and mother tongues, for national examinations such as UPSR, PMR and SPM. Examination papers became bilingual and students may opt to answer in either language, though after 2008, the language medium for Mathematics and Science in UPSR would be restricted to only English (Nanyang Siang Pau, 29/6/2002, n.p). However, initial plans to implement the teaching of Mathematics and Science in English did not include national-type primary schools. The 2002 Amendment to the Education policy only targeted national primary schools (Nanyang Siang Pau, 19/5/2002, n.p). The furor that greeted the initial announcement of the policy played a role in the extension of the policy to all schools. According to the Deputy Minister for Education, Abdullah Azzi, the Ministry of Education wished to extend the 2002 Amendment to the Education Act to all language medium schools to be fair to all. The decision to extend the policy though, needed to meet with the approval of the central Chinese School board of directors. Medium-of-instruction policies for Chinese medium schools are not solely the jurisdiction of the Ministry of Education, given that Chinese medium education is a right that the Chinese community fought hard for and is enshrined in the Constitution (Nanyang Siang Pau, 20/6/2002, n.p).

On 31st Oct, 2002, Dr Mahathir introduced the 2-4-3 scheme (as part of Phase 1 of the 2002 Amendment to the Education Act) for the use of English language and Mother Tongue to teach Mathematics and Science, as well as the introduction of English

language as a core subject, in Chinese national-type schools, starting from 2003 (Ye & Yu, 2007, p.4). Under the 2-4-3 scheme, as announced by the Cabinet, there would be two periods of English, four periods of Mathematics in English and three periods of Science in English, in addition to the teaching of Mathematics and Science in Mandarin. Meanwhile national and Tamil-medium schools teach Mathematics and Science only in English (Nanyang Siang Pau, 31/10/2002, n.p).

Prior to the change in education act, English as a core subject started at Primary 3 while Science started at Primary 4. As the quota for number of periods for primary school is only 50 periods, the addition of 12 extra periods stipulated in the 2-4-3 scheme for Primary 1 (two periods of English, four periods of Mathematics in English and three periods each of Science in English and Mandarin) would clearly be above the quota allowed (previously Primary 1-3 Chinese students attended only 45 periods of lessons per week). The addition of the extra Science periods for Primary 1-3 has resulted in the Ministry of Education reducing three periods from the 15 periods of Mother Tongue as core subject periods in lower primary (Primary 1-3) classes in all medium-of-instruction schools. The four periods of Mathematics in English were taken from Physical Education, Mathematics in mother tongue, Moral Education and a period from principal's choice (see Appendix M) (Nanyang Siang Pau, 26/10/2002). In total, an extra of six periods was added to the time-table for Primary 1 – 3. The original plan proposed by the Chinese political parties was for the addition of two periods each of Mathematics and Science in English to teach the terminology of those subjects in English. The intent was to aid in bridging the gap between Chinese-medium primary education and secondary education (in which Mathematics and Science are taught in solely English for all medium-of-

instruction schools) (Nanyang Siang Pau, 23/10/2002, n.p). Subsequently however, after discussions and negotiations with the then Prime Minister and his Cabinet, the plan evolved to become four periods of Mathematics and three periods of Science in English. These periods were not used to teach terminology in English, but to teach the contents or curriculum in English (Ye & Yu, 2007, p.6).

In regard to the upper primary, it already had 48 periods, so to add five extra periods, as the 2-4-3 scheme did for lower primary, it is impossible for it would seriously exceed the 50 periods allocation allowed. The 2-4-3 scheme is based on lower primary's allocation of periods (the prior 45 periods timetable that did not fully utilize the 50 periods allowed). In addition, there is an addition of subjects in upper primary (eg lifeskills and social studies) (Nanyang Siang Pau, 14/11/2002, n.p). To combat the logistical problems, the Ministry of Education introduced the 6-2-3-2 scheme for Primary 4-6 as the second phase to the 2-4-3 scheme. Under the 6-2-3-2 scheme, there are six periods of Mathematics in Mandarin, two periods of Mathematics in English, with three periods of Science in Mandarin and two periods in English, compared to the formerly seven periods of Mathematics in Mandarin and the former five periods of Science in Mandarin (refer to Table 2) (Nanyang Siang Pau, 23/12/2005, n.p). Thus in both the first phase and second phase of the 2002 Amendment to the Education Act for Chinese school (the 2-4-3 and 6-2-3-2 schemes), the differences between the different language medium schools were great.

Table 2: The 2002 Amendment to the Education Act and its implementation in the various medium schools (in regard to the 2-4-3 scheme for P1-3 and 6-2-3-2 scheme for P4-6).

Subjects	Chinese National-Type Schools		National Schools (Malay-medium)		Tamil National-Type Schools	
	Primary 1-3	Primary 4-6	Primary 1-3	Primary 4-6	Primary 1-3	Primary 4-6
English	2	4	8	7	2	4
Mathematics In Mother Tongue	6	6	0	0	0	0
Mathematics in English	4	2	7	7	7	7
Science in Mother Tongue	3	3	0	0	0	0
Science in English	3	2	3	5	3	5

Note: The comparison is based on periods allocated (Ye & Yu, 2007, p.8).

Thus upon implementation of the 2002 Amendment to the Education Act (with its 2-4-3 and 6-2-3-2 schemes), out of five major subjects that the Chinese primary school teaches, only one subject is taught solely in mother tongue (Mandarin) whereas four subjects (Malay, English, Mathematics and Science) are in languages other than mother tongue (Nanyang Siang Pau, 30/7/02, n.p). Similarly, there are nine periods of English as medium of instruction and now five periods of Malay, giving a total of 14 periods of non mother tongue medium lessons, which is $\frac{1}{4}$ of total periods (Nanyang Siang Pau, 16/3/2005, n.p). Basically, the amount of time spent attending lessons using Mandarin as the medium of instruction has declined greatly under the 2-4-3 and 6-2-3-2 schemes (refer to Figure 1). Incidentally, under the amended education act, the Chinese national-type school's Primary 1 students now have 11 subjects, three more than the national or Malay-medium school, and two more than Tamil-medium national-type schools (Ye & Yu, 2007, p.94).

Figure 1a: Class Time for Primary 1-3 according to medium of instruction (Prior to 2-4-3)

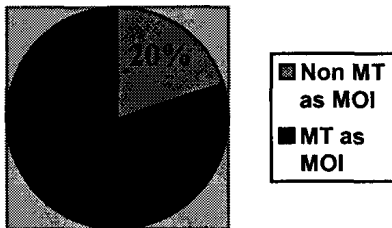


Figure 1b: Class Time for Primary 1-3 according to medium of instruction (After 2-4-3)

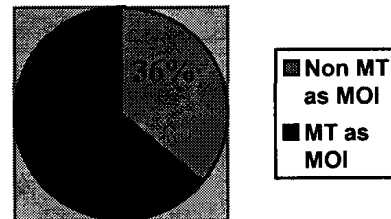


Figure 1c: Class Time for Primary 4-6 according to medium of instruction (Prior to 6-2-3-2)

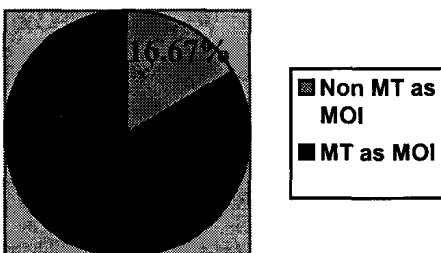
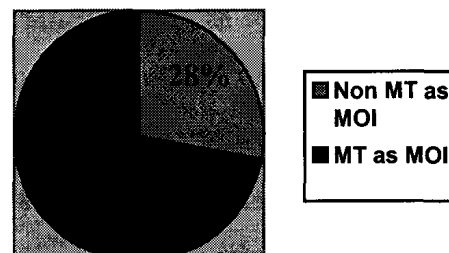


Figure 1d: Class Time for Primary 4-6 according to medium of instruction (After 6-2-3-2)



Source: Ye & Yu, 2007, p.59, 62.

The many changes that the 2002 Amendment to the Education Act has resulted in for the Chinese national-type schools and Chinese education (as well as for the other Tamil-medium schools) have generated great controversy among the various communities in Malaysia, an issue that will be discussed in the following section.

2.12 Response of the different ethnic communities to 2002 Amendment to the Education Act

This change in the education act has caused ripples throughout the different communities. There are fears that English would undermine the position of Bahasa Melayu, consequently challenging its status and development and in turn, the Malays' privileged position in society. In contrast to the Malay community's fears, the reactions

among the Chinese and the Indian communities have been somewhat mixed. All along, the Chinese and the Indian population have had trilingual education in their (vernacular) schools –Mandarin/ Tamil, Malay and English (David & Govindasamy, 2005, p.136). Their experiences with colonialism has taught them the value of English and they believe that knowledge of the English language will help their children secure a better future in the globalized community (Collins, 2006, p.313). However, there are fears among the Chinese community that the ‘encroachment’ of English into Mandarin - medium of instruction curriculum, would impinge on their language, cultural identity and autonomy (Brown, 2005, p.3). To them, the 2002 Amendment to the Education Act poses a threat to the maintenance of Mandarin as a medium of instruction in Malaysia’s national education system. There are concerns that it serves to curtail mother tongue education and relegate Mandarin to something akin to a foreign language (Collins, 2006, p.316). It was thus feared that the new policy would dilute the role of Chinese-medium schools as the protectors of Chinese language and identity (Ibrahim, 2007, p.163). Questions are also raised regarding the viability of policy on the teaching of Mathematics using the English language as examination results shows a high pass rate when Mandarin is the language of instruction, though the use of English to teach Science is more readily accepted as this is perceived to be a subject that relies heavily on English terminology (refer to Table 3 & 4) (Collins, 2005, p.584).

Table 3: Students attaining Marginal Pass or Fail Grades for English, Mathematics and Science subjects in UPSR, PMR, and SPM Examinations in 1998.

Serial	Exam/Level	Sekolah Kebangsaan (National Schools)			Sekolah Jenis Kebangsaan (cina) (National-type Chinese School)		
		Candidate	Fail/Poor	%	Candidate	Fail/ Poor	%
1	UPSR/ D & E						
1.1	English	355,667	158,272	44.5	91,243	32,939	36.136.1
1.2	Maths	356,301	80,168	22.5	91,161	8,022	8.8
1.3	Science	358,194	85,487	24.0	91,145	18,229	20.0
2	PMR/D& F						
2.1	English	236,044	≈154,373	65.4	146,359	≈61,032	41.7
2.2	Maths	236,027	≈115,417	48.9	146,263	≈44,463	30.4
2.3	Science	236,001	≈138,768	58.8	146,197	≈71,490	48.9
3	SPM/7-9						
	English	187,121	≈143,522	76.7	92,239	≈49,256	53.4
	Maths	187,121	122,378	65.4	92,239	36,619	39.7
	Physics	38,881	23,562	60.6	31,295	9,326	29.8
	Chemistry	39,758	25,732	64.7	31,460	10,540	33.5
	Biology	26,578	14,858	55.9	28,486	13,656	35.3

Source: Extracted and adapted from Professor Dato' Isahak Haron, Laporan Kongres Pendidikan Melayu, 2001, pp.103, 105 & 107 based on data provided by Lembaga Peperiksaan, Kementerian Pendidikan Malaysia.

Notes: ≈ estimated only, based on % of poor/failure grades from total number of candidates.

UPSR (Ujian Penilaian Sekolah Rendah): Primary School Leaving Assessment Examination.

PMR (Penilaian Menengah Rendah): Secondary Three School Leaving Assessment Examination.

SPM (Sijil Penilaian Menengah): Upper Secondary School Leaving Assessment Examination

(Abdullah & Chan, 2003, p.108).

Table 4: Students attaining Excellent Grades for English, Mathematics and Science subjects in UPSR, PMR, and SPM Examinations in 1998.

Serial	Exam/Level	Sekolah Kebangsaan (National Schools)			Sekolah Jenis Kebangsaan (cina) (National-type Chinese School)		
		Candidate	Excellent	%	Candidate	Excellent	%
1	UPSR/ D & E						
1.1	English	355,667	41,613	11.7	91,243	18,705	20.5
1.2	Maths	356,301	90,144	25.3	91,161	49,318	54.1
1.3	Science	358,194	46,661	13.1	91,145	17,318	19.0
2	PMR/D& F						
2.1	English	236,044	≈19,356	8.2	146,359	≈29,711	20.3
2.2	Maths	236,027	≈37,764	16.0	146,263	≈59,529	40.7
2.3	Science	236,001	≈27,376	11.6	146,197	≈36,403	24.9
3	SPM/7-9						
	English	187,121	≈6,362	3.4	92,239	≈13,744	14.9
	Maths	187,121	30,500	16.3	92,239	38,002	41.3
	Physics	38,881	1,010	2.6	31,295	5,414	17.3
	Chemistry	39,758	1,669	4.2	31,460	7,235	23.0
	Biology	26,578	1,142	4.3	28,486	4,928	17.3

Source: Extracted and adapted from Professor Dato' Isahak Haron, Laporan Kongres Pendidikan Melayu, 2001, pp.103, 105 & 107 based on data provided by Lembaga Peperiksaan, Kementerian Pendidikan Malaysia.

Notes: ≈ estimated only, based on % total number of candidates.

UPSR (Ujian Penilaian Sekolah Rendah): Primary School Leaving Assessment Examination.

PMR (Penilaian Menengah Rendah): Secondary Three School Leaving Assessment Examination.

SPM (Sijil Penilaian Menengah): Upper Secondary School Leaving Assessment Examination

(Abdullah & Chan, 2003, p.113).

The Chinese community thus argued that the best way to master Mathematics and Science is through the mother tongue, basing their presupposition on the successful examples of Japan and Germany (who had managed the process of industrialization very successfully via their own ethnic language without needing the English language) (Gills,

2005, p.46). Overall, the threat perceived was deemed to be so devastating and threatening to the Chinese minority, that Chinese educators have referred to the latest 2002 Amendment to the Education Act as 'the Final Solution', a phrase with "chilling connections to an existential threat" (Collins, 2005, p.581).

2.13 Conclusion

In reviewing the literature and historical documents pertaining to Chinese education in Malaysia, it is apparent that the change in educational policy- which officially aims at language enrichment (the addition of a second language at no cost to the first language) and maintenance (of the dominant Bahasa Melayu with its associated identity) for the majority Malay community- includes transitional aims and features for the Chinese minority in Malaysia, because its aim is to effect a transition from the teaching of Science and Mathematics in Mandarin and Tamil to English. Ultimately, the bilingual education policy instead of effecting a transition to the main dominant language of Bahasa Melayu (in higher education), is in actual practice, trying to effect a transition to two languages, the dominant Bahasa Melayu and the English language. The functions and roles of the Chinese minority's language, in this case, are being dramatically reduced. This new bilingual policy is no different from previous education policies in terms of its goals as the minority Chinese students are still not given the opportunity to function in their mother tongue in higher education. In fact, this policy serves to further assimilate and integrate the minority Chinese community into the larger Malaysian society. To conclude, the goal of the new bilingual education policy – 2002 Amendment to the Education Act- is still the same for its minorities, to effect a transition to the majority and national language (Bahasa Melayu) and a second majority language (English).

This literature review attempts to provide an academic framework on which to base this study. The discussions outlined in this chapter serve as a backdrop against which the findings of the present study can be contextualized.

CHAPTER 3: METHODOLOGY

3.1 Introduction

The purpose of this study is to answer the two main research questions, “What are the effects of the implementation of the 2002 Amendment to the Education Act on Chinese national-type schools?” and “What are the implications of 2002 Amendment to the Education Act for Chinese-medium education?” Subsets of the research questions proposed above are i) what are the challenges that the implementation of the policy in Chinese national-type schools would bring for the school, the educators and the students in regards to Chinese-medium education?, ii) what changes have occurred as a result of the implementation of the policy (in regards to school administration and teaching practices etc.)?, iii) what kind of support do the school and teachers have to cope with the challenges ?, iv) what is the effect of the education policy on Chinese students’ learning and academic achievement in Mathematics and Science, if any?, and v) what are the perceptions and attitudes of the various stakeholders in Chinese-medium schooling-educators, parents and students- regarding the new education policy? To answer the research questions and the sub-questions raised earlier, I adopted a case study methodology that utilized the different approaches in research – the document analysis approach, and the survey approach.

In this section, I explain and justify the case study approach used and the instruments adopted. Next, I present a detailed description of the research procedures, starting with a description of the nature of the sample I chose for my study. Following that, I discuss the surveys that were administered to the sample, and the instrument/s used

for data collection. Next, a detailed description of the procedures involved in the undertaking of the study is given. Lastly, I will address the issue of data analysis.

3.2 Rationale for case studies methodology

For this study, a case study methodology was chosen to analyse Malaysia's bilingual education planning. The 2002 Amendment to the Education Act currently underway in Malaysia, with respect to the Chinese-medium schooling, provides the basis for the case study.

The rationale for the adoption of a case study methodology is based on Picciano's (2004) observation that a case study is the detailed study of an 'instance' in action, in short, a specific instance from the class of phenomena which one is studying, and it investigates the way this instance functions in context (p.75). Hitchcock and Hughes describe in Cohen, Manion and Morrison (2005), that the hallmarks of a case study are: concern with a rich and vivid description of events relevant to the case; a description of events blended with the analysis of them; and a focus on individual actors or group of actors and seeks to understand their perception of events through an adoption of emic perspective (p.182).

The above description and functions of case study correspond to the purposes of this research study, which is to describe in detail and analyse the 2002 Amendment to the Education Act with regard to the implementation in and implications for Chinese national-type schools. As I want to obtain an in-depth description of the role and functions of bilingual education planning for Chinese minority in Malaysia, case study with its emphasis on investigating and reporting "the complex dynamic and unfolding

interactions of events, human relationships and other factors in a unique instance”, makes it an ideal methodology for the purposes of my study (p.181).

Furthermore, its strength in establishing cause and effect- through the observation of effects in real contexts- and its recognition that the context is a very important determinant of both causes and effects, makes it an appropriate instrument for the study of the implications of the 2002 Amendment to the Education Act for Chinese-medium education.

The most important aspect of a case study that makes it an attractive and appropriate methodology for many beginning researchers, is its inherent flexibility. Its ability to be flexible in both spectrum and depth has made it the methodology of choice of many beginning and individual researchers (Picciano, 2004, p.46). Its flexibility also extends to the type of approaches that it utilizes. While most case studies rely on qualitative approaches (such as interviews, observation, document analysis etc.), quantitative instruments (surveys, school databases etc.) are common as well. According to Picciano, many case studies adopt the triangulation approach in which both qualitative and quantitative approaches are utilized (p.44). Triangulation is the “process of using multiple methods, data collection strategies and data sources to obtain a more complete picture of what is studied and to cross-check information” (Gay, Mill & Airasian, 2006, p.405). As Creswell states (2008), applying triangulation in research will blend the strengths of both qualitative and quantitative approaches and neutralize the weaknesses of both approaches (p.553). In short, it means that the quantitative approach used will yield data that can provide for generalizability, whereas the qualitative approach employed will permit for the gathering of data that offers an in-depth ‘look’ at individuals, contexts or

settings (p.558). Consequently, the researcher will be able to establish converging lines of evidence to make her/his findings “as robust as possible” (Yin, 2006, p.115). In so doing, a more complete and accurate understanding of the topic will develop and credibility of results will be enhanced due to the use of multiple methods or data sources etc (Lodico, Spaulding & Voegtle, 2006, p.286).

For the purposes of my study, I intend to employ methodological triangulation as it offers a richer and more in-depth view of the “complexity of human behaviour and of situations in which human beings interact”, through studying the phenomenon from more than one standpoint and making use of both qualitative and quantitative data (Cohen, Manion & Morrison, 2005, p.112). Methodological triangulation will also avoid exclusive reliance on one method, preventing the bias or distortion of the researcher’s picture of the “particular slice of reality” that he or she is investigating (p.112). By so doing, it serves as a check on the validity of the study.

In consideration of all the above factors, the objectives of this research study would be best satisfied through the adoption of the case study approach.

3.3 Rationale for survey approach

Survey research is defined as a form of descriptive research that involves collecting data about beliefs, attitudes or behaviour through the use of questionnaires, interviews, or paper-and pencil tests (Gall, Gall & Borg, 2006, p.173). Generally, the purpose of a survey is to obtain a snapshot of conditions, attitudes, and /or events at a single point in time (Nunan, 2006, p.140). This definition and function of survey approach thus correlates with one of my primary purposes in carrying out this study, which is to explore the implications of 2002 Amendment to the Education Act on

Chinese national-type schools, through describing the views, attitudes and practices of the Chinese parents and students. As I want to capture a general picture of perceptions, attitudes and practices, the survey approach, with its ability to represent a 'wide target population' and, to provide descriptive information that allows for the making of generalizations about patterns in responses, is an ideal method for the purposes of my study (Cohen, Manion & Morrison, 2005, p.171).

Of the various survey instruments mentioned above, the questionnaire is selected for the collation of data pertinent to the study of my topic. As Bell (1987) states, there are distinct advantages to the use of questionnaires (p.65). Firstly, personal contact with every participant is not always feasible. Questionnaires however, can be easily distributed and data collected via a third party, without need for physical or personal contact between the researcher and the research participant (Gall, Gall & Borg, 1999, p.297). It thus helps the researcher to surmount obstacles to access to participants. This characteristic of questionnaires makes it particularly appropriate for my study as time constraints and access due to 'sensitivity' of the topic made obtaining access a huge challenge. The use of questionnaires helps one to collect data within a short time span despite the difficulty in obtaining access to participants.

Secondly, most questionnaires have the advantage of guaranteeing confidentiality or anonymity. It will probably elicit more truthful responses, particularly with regard to somewhat sensitive information, than would be obtained from a personal interview. As Ary, Jacobs and Razavieh (1996) state, "In an interview, subjects may be reluctant to express unpopular or politically incorrect points of view or to give information they think might be used against them at a later time" (p.436). As the study aims to explore

participants' attitudes and beliefs (variables which are sensitive and personal) in regards to a somewhat 'sensitive' topic, the use of questionnaires is especially appropriate as it protects the participants' identities.

Thirdly, the costs and time involved are considerably less compared to many other approaches (p.437). The collation of data from questionnaires is a one time effort, and also does not require personal contact with each and every research participant, thus the amount of time involved is drastically reduced. Additionally, the low costs involved in questionnaires is a huge consideration for researchers with monetary constraints.

The most important consideration is that standardized, quantifiable information can be obtained from a questionnaire. As all research participants respond to the same options in the questionnaire, standardized data are provided. Thus, scoring and analysing such data is easier and less time consuming compared to many other research approaches, thus making it an appropriate and suitable approach for a beginning researcher (Gay, Mills & Airasian, 2006, p.166).

Due to limitations in resources (time, manpower and monetary), the ability of a survey to gather a wide range of standardized data on a one-shot basis makes it an economical and efficient instrument to use and therefore very appropriate for this study (Cohen, Manion & Morrison, 2005, p.171).

3.4 Rationale for document analysis approach

Documentary evidence consists of public and private records that qualitative researchers obtain about a site, context or participants in the study. Public records are documents that reflect beliefs, attitudes, and behaviours beyond those of a particular individual, of a particular group or institution, such as official documents, government

documents, newspapers, educational documents, textbooks etc. Meanwhile, private records include “any material produced by an individual that provides insights into the person’s beliefs, attitudes, and behaviours” (Hancock, & Algozzine, 2006, p.51). As Duffy suggests, documentary evidence can be used to support or supplement information or data obtained by other methods (as cited in 1999, p.106). Thus it is an excellent means of triangulation and can help increase the reliability and validity of the research findings from primary sources (Wellington, 2000, p.121). Additionally, most educational research requires the analysis of documentary evidence (Bell, 1987, p.106). The reason given is that documentary evidence is independent of the researcher’s study and therefore is less biased, for it can either support or counter the claims and findings of the researcher (p.107). The strength of document analysis in increasing reliability and validity (which is often an issue in case study and qualitative methodologies), in addition to its ability to supplement information obtained from primary sources (helping to enrich the understanding of and meaningful interpretations of the context), makes it an appropriate instrument for use in this research study.

In this study, the documentary evidence I analysed included Mathematics and Science textbooks, newspapers and the results of the “2-4-3 Implications for Chinese National- Type Primary Schools” survey carried out by The United Chinese School Teachers’ Association of Malaysia in 2006. According to McKernan (1996), documents provide facts pertaining to the subject and serve to “illuminate the purposes, rationale and background history of the topic, event or subject of the investigation” (p.148). The textbooks are meant for the study of the implementation and its corresponding implications at the micro-level, the challenges faced by the national-type Chinese schools

and the support given by the government in response to the change in policy. As for newspapers, they serve to increase contextual understanding of the change in policy and its related effects on the community. The results of “2-4-1 Bilingual Education Policy for Elementary Chinese National-Type Schools” survey are included in my data collection because it provides a more comprehensive perspective on the implications of the new policy on the different stakeholders in Chinese national-type schools –the students, teachers and school administration- as it surveyed 281 Chinese primary schools in Malaysia. It would also serve to validate the results of the surveys conducted for this study through providing for a cross-comparison with data obtained from the research participants- students and parents.

As Creswell (2008) states, documents can “provide valuable information in helping researchers understand central phenomena in qualitative studies” and augment data obtained from other methodological approaches (p.231).

3.5 Sampling

The sample for this study was chosen through purposive sampling or criterion-based sampling as they are “easier to establish and, in consequence cheaper” (Nunan, 1992, p.142). In addition, the intent in qualitative research is not to generalize to a population, but to develop an “indepth exploration of a central phenomenon” (Creswell, 2008, p.213). To obtain an in-depth understanding of the phenomenon under study, it is imperative to select participants that might contribute ‘useful’ information, that will help others ‘learn’ about the phenomenon and give ‘voice’ to the salient issues under investigation (p.214).

As regards the sample size for the student questionnaire, the targeted sample was limited to approximately 35, due to difficulties in obtaining access to students. The selection of the students for the survey rests on two determining factors. Firstly, these must be Chinese students enrolled in Chinese national-type primary schools, reason being the presence of non-Chinese enrolled in the Chinese national-type schools. Secondly, they must be at least Grade 4, as older students are more likely to be capable of responding to the survey questions with understanding. As Picciano (2004) states, “Consideration must be given to the reading levels of target populations especially in students that involve children whose literacy skills are still developing” (p.24).

As for the selection of parents for the survey, access posed to be even more of a challenge. Hence, the sample size selected was smaller, with a targeted sample size of 20. The first determining factor for the selection of participants for the parent survey was that they must have children who are currently enrolled in Chinese national-type schools, as they are then directly affected by the change in education policy. Second, they must have attended Chinese national-type schools previously, so they can compare their own learning experiences to their children’s.

To obtain the student and parent sample, I liaised with a senior teacher in the upper grades and explained to her, the study and its purposes. The assistance of the teacher was sought to help distribute the letters of information and student questionnaires to students. Similarly, they brought home, the parent questionnaires for their parents. She explained the research study to the students and collected the sealed questionnaires (students and parents) from the students. Both letters and questionnaires were translated and Mandarin versions of the documents accompanied the English versions.

The sampling for this case study thus rests on the requirements of the study, the ease in which non-probability sampling can be set up and its lower costs.

3.6 Questionnaire surveys

The questions in the questionnaires were a mix of open and close-ended questions. This combination was selected because predetermined close-ended responses could net useful information that could possibly help me with developing answers to the questions that the study raises. Close-ended questions were selected also because of the sensitive research topic. As Creswell states (2008), close-ended questions are appropriate for eliciting sensitive data “because participants might feel more comfortable knowing the parameters of response options” (p.398). As all participants respond to the same options in the questionnaires, standardized data are obtained, providing for ease in scoring and coding of information (an important consideration for a beginning researcher).

However, there are limitations in the use of close-ended questions. Firstly, there is a possibility that “an individual’s true response is not present among the options given” (Fraenkal & Wallen, 2006, p.403). Thus, in the questionnaires designed, the “other” choice is provided for some of the items, where the subject can “write in a response that the researcher may not have anticipated” (p.403). The second limitation of close-ended question is that data elicited may not garner sufficient insight into whether respondents really possess any information or any clearly formulated opinions about an issue. As Ary, Jacobs & Razavieh (1996) state, “it is easier for the uninformed respondent to choose one of the suggested answers than to admit to a lack of knowledge on an issue” (p.442). Thirdly, there is the limitation of possible misinterpretation of questions by respondents. It is extremely difficult to formulate a question that means exactly the same to every

respondent, or convey accurately what the investigator mean. Poor wordings or differential meanings of terms could result in significantly different interpretations being made by the respondent (Ary, Jacobs & Razavieh, 1996, p.436).

Factoring in the above-described limitations of close-ended questions, I decided to include open-ended questions in the questionnaire designed. Open-ended responses can “net useful information to explore reasons for the close-ended responses and identify any comments people might have beyond the responses to the close-ended questions” (Creswell, 2008, p.228). However, due to the drawbacks in coding and analysis, minimum open-ended questions were included. As Creswell states, “Open-ended responses require transforming word responses into numbers”, a process which may take considerable time and effort, not to mention expertise (p.399). Some of the responses may be unclear, or the researcher is unsure how to classify or code the response. Additionally, some respondents may give more than one response to a particular question (Ary, Jacobs & Razavieh, 1996, p.442).

The students’ questionnaire surveys consisted of 17 questions (Appendix A) with 15 close-ended questions and two open-ended questions. Meanwhile, the parents’ questionnaire surveys consisted of 15 questions (Appendix B), of which 14 were close-ended questions and one open-ended question. Altogether, 32 questions addressed some of the features or issues delineated in the literature review. The questions were grouped under the five themes as follows:

- Background Information (BI)
- Teaching practices (TP)
- Participants’ beliefs and perceptions (PBP)

- Support for students from parents (i.e. tutoring) (SSP)
- Student Performance (SP)

Some of the questions in the interviews and questionnaires apply to certain of the themes more than others.

3.7 Data Collection Procedures

I planned a three- prong approach towards obtaining data for my research study. However, there are difficulties in obtaining official consent for conducting the research in schools due to the somewhat ‘sensitive’ topic and timing (due to approaching national elections). Hence, on one hand, I sought the assistance of a current teacher, in her unofficial capacity, in obtaining data from questionnaire surveys. On the other hand, I also sought the help of a parent in distributing the questionnaire surveys. In order to obtain data for the questionnaire survey, I contacted a senior teacher in the upper grades, through an intermediary, and a meeting was set up. The meeting was arranged with the following objectives in mind, a) to explain to her, the research questions, rationale and objectives of the research study, and b) to seek her help in disseminating and collecting the letters of information and questionnaire surveys to the students. It was emphasized to the teacher that her participation and that of her students, were entirely voluntary, and that there was no coercion or undue influence in obtaining consent to participate. At the same time, letters of information and questionnaires were distributed to the students. Questionnaire surveys were also distributed to the students to take home to their parents.

Through a mutual acquaintance, I was introduced to a parent who had a child studying in the upper grades in the school of the abovementioned teacher. I had a meeting with the parent, and I explained the research study to her and sought her help in

disseminating the letters of information and questionnaire surveys to classmates of her child. Questions for the questionnaire survey were prepared from a review of the relevant literature and school documents, and translated into Mandarin prior to the survey.

Altogether, 55 copies each, of student and parent questionnaire surveys were distributed, with a return rate of 42 student surveys and 27 parent surveys. Upon return of the questionnaire surveys by both the teacher and the parent, the precoded data were collated and analysed.

In regards to documentary evidence, I managed to borrow one copy each of the Primary 5 Mathematics and Science textbooks in both English and Mandarin, currently in use in Chinese national-type primary schools. The results of the “2-4-3 Implications for Chinese National-Type Primary Schools” survey carried out by The United Chinese School Teachers’ Association of Malaysia in 2006 were derived from a publication, “The Suitability of English Teaching of Mathematics and Science” which I obtained from a contact in the United Chinese School Teachers’ Association. Besides obtaining the above documentary evidence, articles from a local Chinese newspaper- the Nanyang Siang Pau- also served as evidence for analysis. The documentary evidence would form the basis for generating categories or themes for the general discussions and questionnaire surveys, as well as refining the research questions (besides supplementing the data obtained from primary sources).

After many futile attempts, I finally managed to obtain a meeting with a principal from a Chinese national-type school, who was agreeable to participating in the research, albeit not in an official capacity. I explained to her the objectives of the research study and sought her permission to have a general discussion regarding my research topic. I

also sought her assistance in contacting a potential teacher subject for a general discussion on research issues that had been previously identified through a review of pertinent literature. I made it clear to both the principal and the teacher that they were free to withdraw from the discussions at any time, that there was no right or wrong answer and they could freely express their opinions in the discussions. Additionally, their confidentiality would be protected as their names and personal details would be omitted in the notes. They were represented in codes on the notes and all research data. Nor would the informal discussions be recorded using electronic devices, but rather in my written field notes.

The two informal discussions were conducted in personal, face-to-face encounters in the principal's office and an empty classroom in the school, areas the participants felt to be the most comfortable and convenient, given their busy schedules and the sensitive nature of the discussion. During the interview, questions were asked in both English and Mandarin, and upon approval of the participants, duly noted. Additional questions were asked to seek clarification or expansion of their responses. Questions for the discussion were prepared from a review of the relevant literature and documents, and translated into Mandarin prior to the interview. After the transcription of the data, it was coded and analysed.

3.8 Data organization & analysis

The literature review revealed emerging themes and similarities and these formed the basis for pre-established themes. A content analysis of the documents was undertaken. The documents were summarized, analysed and coded based on the key questions. According to Creswell (2008), "coding is the process of segmenting and

labeling text to form descriptions and broad themes in the data” (p.251). The documents were thus coded to “make sense of text data” (p.251). The codes obtained were then categorized according to the themes. A theme, in its most basic form, is “a simple sentence, a string of words with a subject and a predicate” (Hancock & Algozzine, 2006, p.59). However, in qualitative research, themes (as Creswell defines), are “similar codes aggregated together to form a major idea in the database” (Creswell, 2008, p.256). Themes are used in qualitative research for answering the major questions; forming an in-depth understanding of the phenomenon under study, and analyzing qualitative data (p.256). These codes are then tabulated, and displayed in tables that summarize the numerical data obtained. The themes are revised or expanded if important and relevant issues that could lead to the answering of the research questions arose.

The responses from the general discussions were transcribed, reviewed and notes necessary for purposes of clarification were added. The data from the responses and open questions in the students’ and parents’ questionnaires were also carefully reviewed, analysed, and coded based on the research questions. They were categorized into themes and tabulated. A re-analysis of the data was undertaken, to determine if there was a need to revise the research questions. If necessary, the research questions are revised, refined and the themes expanded or revised (Gall, Gall & Borg, 2007, p.259).

The questions in the student and parent questionnaires were coded. Predetermined responses to close-ended questions and respondent information in the questionnaires were precoded, so that the data could be easily and swiftly analysed. Data from the questionnaires, with the sample size being small, were then processed and analysed manually to get the frequency, which is then displayed in a table.

To describe and analyse all the data obtained, a spreadsheet was designed. The research questions were clustered under the respective themes and the coded responses of the different subjects (general discussions, parents and students questionnaires, and the various documents) are categorized carefully under the relevant research questions. The responses were then analysed for similarities or patterns that could lead to the formation of new research questions and/or the generating or amendment of themes pertaining to the two main research questions of the study. Data were calculated manually for frequency, and put under the appropriate research question category. Certain qualitative responses were also categorized under these categories. A re-analysis of the data then took place to ensure the correct categorization of the responses. Cross –comparison analysis occurred next, and similarities and differences between the responses were identified. Inferences and description, from the cross comparison analysis of both the qualitative and quantitative data, would then form the basis for the writing of the report. Meanwhile, the literature review served to support the research findings, which were then correlated with the findings from the literature review.

3.9 Limitations and challenges of the study

There are several variables that resulted in issues that may be of concern in this study. These variables, consequences of the choice of methodology and limits in resources, impacted the research greatly, influencing the direction, design and progress of the research. Thus, in this segment, I undertake to provide a description of the variables that have impacted this study heavily. The variables described in this segment are: time; and resources; access; generalizability; ethical issues and validity and reliability.

3.9.1 Time and resources

One of the variables that may be of concern is the issue of time and resource costs in conducting the document analysis and the questionnaire surveys. The document analysis consisted of textbooks, and newspapers from May 2002 to April 2007. The number of documents under analysis is immense. Given the limited human resource and the time constraints, it proved to be rather difficult to analyse all the textbooks for Mathematics and Science in Chinese national-type schools, as well as all the newspapers in Malaysia (within the five years' time period). Thus, I conducted an analysis of Primary 5 Mathematics and Science textbooks (in English and Mandarin) only, whereas I only focused on one local Chinese newspaper –the Nanyang Siang Pau- for my document analysis of newspaper articles. In addition, research collation was done in Malaysia, thus posing a problem for follow- up and clarification purposes.

3.9.2 Access

Another variable that necessitated changes in my research study is access. “What if the study is on a sensitive topic and the participants would not want to be involved if they were aware of the topic?” (Crewsell, 2008, p.238). This is a question that haunts my research. Before the actual data collation in Malaysia, I did not expect the topic to be very sensitive, as it only concerned an exploration into the implications of a change in policy for Chinese education. I had spoken to a contact who liaised with a head of department in a Chinese primary school and they had assured me that consent would be given to conduct my study in the abovementioned school. On arriving in Malaysia, I realized that the issue had become sensitive due to the upcoming elections. Despite the sensitivity of the issue, I was still able to conduct my study with help from volunteers, though

permissions to audio-tape the discussions were denied. I sought the help of a current senior teacher (in her unofficial capacity) and a parent to assist me in distributing the questionnaires. The sample for the questionnaires was thus not as standardized as preferred, as the student and parent participants did not come from the same class. Nor the sample size was as large as initially desired. As Creswell states, “factors such as access, funding, the overall size of the population and other variables that will influence ...the samples” (p.156).

My initial plan to interview teachers to glean information on the impact that the policy on school administration and teaching practices had to be revised to a general discussion as few teachers would consent to being interviewed. Even the principal and teacher who agreed to an informal discussion with me, consented only on condition of anonymity and that the discussion was not tape recorded.

The sensitivity of the issue also made obtaining documentary evidence such as a copy of the 2002 Amendment to the Education Act, lesson plans, school and ministry circulars etc., that are directly relevant and could provide the strongest evidence for my research study, difficult. Some government documents could not be accessed due to government regulations and the lack of translation (most government documents are in the Malay language). I therefore had to look for alternative documentary evidence in the form of textbooks and newspapers.

Access is indeed, a huge factor in determining the direction and design of my research. If access to schools had been granted, a more comprehensive and in-depth description of the phenomena could have taken place.

3.9.3 Generalizability

According to Picciano (2004), since “case studies concentrates on a single specific activity or entity, the researcher cannot generalize the study’s findings to larger populations” (p.44). He adds that any inferences made regarding the applicability of elements within the case study to other case studies are to be left to the reader and his/her discretion. However, other researchers hold a contradictory view. As Cohen, Manion and Morrison (2005) state, “the purpose of observation in case study is to probe deeply and to analyse intensively the multifarious phenomena that constitute the life cycle of the unit with a view to establishing generalizations about the wider population to which the unit belongs” (p.185). Proponents of this view, MacDonald and Walker, define case study as “the examination of an instance in action. The choice of word ‘action’ is significant in this definition, because it implies a goal of generalization” (as cited in Bassey, 1999, p.24). In fact, Stenhouse, explains that the adoption of case study as a methodology does not preclude an interest in generalization as many researchers seek theories that will “penetrate the varying conditions of action, or applications founded on comparison of case with case” (as cited in Bassey, 1999, p.26). Thus in this sense, generalizations and application are matters of judgment rather than calculation, and the task of case study is to “produce ordered reports of experience which invite judgment and offer evidence to which judgment can appeal” (p.26).

This case study, in its adoption of the case study methodology and the purposive sampling approach, is limited in its ability to generalize to the wider population. Adopting a multi-case approach though might increase its generalizability. From the stance-point adopted by most of the researchers above, the study of 2002 Amendment to

the Education Act and its relationship with Chinese-medium education (though limited to a specific community and instance) could yield findings that may help in theory generating for other researchers working in the field of linguistic rights, minority education and bilingual education, not to mention the study of the other minorities within the Malaysian education system.

3.9.4 Ethical Issues

In this study, the researcher has taken steps to adhere to the ethics protocol as stipulated by the Research Ethics Board in the 2002 UWO Guidelines. Measures have been implemented to protect as much as possible the confidentiality and anonymity of the participants. In the notes taken during the general discussion, the participants' names and personal details were omitted. They are represented in codes on the notes and all research data. Furthermore, the discussion was conducted on a one-to-one basis, ensuring the protection of the participants' identity.

As for the questionnaire respondents (students and parents), the respondents were not asked to print their names on the questionnaires and questions seeking personal information were kept to the very minimum and general. The information was represented in codes in the report, thus ensuring confidentiality and anonymity of the respondents. Assurances were given to all the respondents that their responses and data (as well as identity) would be coded, kept confidential and the only persons to have access to the interviewees' data would be the researcher and possibly the researcher's supervisor.

3.9.5 Validity and reliability

For the case study methodology, internal validity is an issue only for causal or explanatory studies, and as this study is an exploration and description of a policy, internal validity is not of concern in this study (Nunan, 1992, p.80). As regards external validity, due to its difficulties in generalizing to a wider population, external validity is low for this approach (Bassegy, 1999, p.75). A triangulation of the different research approaches utilized in this approach though, would help enhance the validity, as well as reliability, in this research study.

According to Cohen, Manion and Morrison (2000), validity of questionnaires could be viewed from the stand point of the accuracy, honesty and correctness of the responses (p.128). The question of accuracy, honesty and correctness of responses can be checked by the use of the triangulation of methods to enhance the accuracy and correctness of responses. Honesty of responses is ensured by the anonymity of the respondents as respondents tend to give more honest responses in encounters which do not necessitate face to face encounters.

In the issue of reliability however, questionnaires, by virtue of being anonymous and having no face-to-face encounters, tend to elicit greater honesty and higher reliability. Questionnaire respondents may feel more comfortable and disclose sensitive and private information more readily.

To conclude, adopting methodological triangulation for this case study will hopefully counteract the limitations of the different approaches used, thus strengthening the validity and reliability of the study.

3.10 Concluding remarks

Chapter 3 has included a description of my methodological journey. The questionnaire surveys provided me with quantitative information describing beliefs and attitudes of parents and students with regard to the implementation of the 2002 Amendment to the Education Act. The documentary evidence helped illuminate the study, providing qualitative information that aids in the meaningful interpretation of the data collected and the context.

In Chapter 4, I will present the findings for the respective approaches adopted and a cross-analysis of data obtained will be carried out, after which emerging themes will be discussed.

CHAPTER 4: FINDINGS

4.1 Introduction

In this chapter, data regarding the implementation and implications of the 2002 Amendment to the Education Act, as regard Chinese national-type primary schools in Malaysia, is presented. Data presented were obtained from surveys conducted with various stakeholders in the Chinese community, a review of news articles from a local Chinese newspaper, an analysis of textbooks for Chinese national-type schools and informal discussions with educators.

The issues inherent in the change in policy are diverse and numerous as it affects not only one community but the Malay and Indian communities as well. However for the purposes of this study, only areas pertaining to the implementation in Chinese national-type primary schools and its rippling effects on the various factions of the Chinese community are addressed in detail. Concluding the summation of the data collated is a discussion of themes emerging from a cross-analysis of the various strands of data.

This chapter is divided into two major sections. The first section presents the collated data while the second section deals with the cross-analysis of the data. The first section is divided into three subsections. The first subsection presents a brief description of survey respondents and results as collated by both the United Chinese School Teachers' Association of Malaysia (Dong Jiao Zhong) and me. Following that, results of analysis of newspaper articles from the local Chinese newspaper (Nanyang Siang Pau), and Mathematics and Science textbooks (in both the English language and Mandarin) are outlined. The third subsection concerns an overview of the personal profiles of the educators (with whom discussions on the amended education act were conducted) and a

brief account of the proceedings of the discussion. The patterns that emerged from the account of the discussion are integrated and cross-analysed with those from the other sources to give rise to the subsequent section and themes.

The second section is divided into two major themes. The first theme describes the 2002 Amendment to the Education Act and its relationship with the Chinese national-type primary school. Under this theme, two sub-themes are studied, namely the ensuing changes and problems resulting from the change in educational policy, and the support for both schools and teachers. The second theme explores the responses of the Chinese community towards the 2002 change in educational policy. Within this theme, three sub-themes are examined. The three sub-themes comprised of responses from the educators, students and the parents. Concluding remarks for the data collated and analysed conclude the chapter.

4.2 Data Collated

4.2.1 Survey Results

4.2.1.1 Student Survey

As part of my enquiry into the implications of the 2002 Amendment to the Education Act for the Chinese community, I conducted a survey of 42 Chinese primary school students. All of them had enrolled in primary school after the implementation of the new educational policy, and thus, the implications are directly manifested in their attitudes and responses. This survey furnished information on their backgrounds, their facility and familiarity with a pluralistic language environment, their perspectives on languages and the change in the medium of instruction for Math and Science and, their beliefs regarding the impact it has on their academic performance.

The survey yielded 42 respondents, 39 of which are ethnic Chinese and the majority (85.7%) of which are capable of speaking, reading or writing more than one language or dialect (see Appendix H). Nonetheless, 81% reported that Mandarin is the language they use more often. It is apparent that Mandarin is the predominant language for the Chinese students, despite their ease with and familiarity in communicating in languages other than Mandarin. This response is corroborated by the high percentage (50%) of students who chose Mandarin as the language they wanted to learn the most. 95.2% of these students cited Mandarin is an important language and it is their mother tongue, as the reasons for their choice. However, English is also valued as a desirable language as 14 of the 21 students (who chose Mandarin as the language they want to learn the most) selected English as the second language they want to learn. In fact, there are seven students (16.7%) who chose English as the language they want to learn the most, which amounts to the combined numbers of students who chose Tamil or Malay as the language they want to learn the most.

As regard the students' personal preferences for English and its presence in their learning, 76.2% of the students reported that they like to learn English, though only 33.3% liked learning Mathematics and Science in English and only 28.6% would want to learn other subjects through the medium of English. In addition, 71.4% of the students reported feeling most comfortable with Mandarin as the medium of instruction for learning Mathematics and Science, as opposed to the 16.7% who felt comfortable with English as the medium of instruction for these two subjects. This evidence is borne out by the huge numbers (59.5% for Mathematics and 62% for Science) of students who are less likely to participate in Mathematics and Science lessons in English. It is thus evident that

most students preferred having their mother tongue as the medium of instruction for learning Mathematics and Science.

Despite their preference for mother tongue instruction, most students (50% for Mathematics and 45.2% for Science) believed that they would obtain 80% and above for Mathematics and Science in the UPSR Primary 6 National Examinations. Of the 21 students who believed they would perform well for Mathematics in the UPSR national examinations, only two stated that they like using English to learn Mathematics and it is not difficult to learn Mathematics through English. Meanwhile, a large number of students stated that their command of English is average or good (seven students), implying that their facility in English would contribute to their good performance in Mathematics in the UPSR examination. Conversely, out of the eight students who believe that they would obtain less than 60% for Mathematics in the UPSR examination, half of the students believed that they would perform badly, as they disliked using the English language to learn Mathematics and one student cited the reason for his/her 'weak performance' as resulting from his/her lack of mastery in English.

In comparison, out of the 19 students who believed they would obtain 80% and above for Science in the UPSR Primary 6 National Examinations, three students stated that they liked learning Science in English and they understood the teaching of Science better in English. Similarly, four students suggested that their facility in English had contributed to their good performance in Science in the UPSR examination. Conversely, 50% of those students who perceived that they would perform badly in Science in the UPSR examination, disliked the learning of Science in English and another two students stated that their mastery of English is poor, thereby contributing to incomprehensibility in

understanding the examination questions, and in turn, below par performance in Science in the UPSR examination.

As the results of the survey on students provided me with only a slice of the reality of the implications of the 2002 Amendment to the Education Act for the Chinese community, it was necessary to supplement the survey data with information from responses of parents, teachers and schools, so as to glean a richer and more insightful picture.

4.2.1.2 Parent Survey

Another portion of my study, of the implications of the 2002 Amendment to the Education Act for the Chinese community, explores parents' responses and beliefs. Information for this survey was obtained from Chinese parents who had children currently attending Chinese national-type primary schools. Thereby, their responses were most directly relevant to the research study. The survey provided data on parents' backgrounds, their beliefs regarding languages, parental support and students' learning in regard to the amended act.

The survey posted responses from 27 respondents, the majority (74%) which had attended postsecondary education institutions (see Appendix G). Like their children, nearly all of the respondents (96.3%) are proficient in the reading, speaking or writing of more than one language or dialect, with Mandarin being the language that almost all of them have mastered proficiently. Despite the use of Mandarin as the dominant language among these parents, the language they most desired their children to learn is English (37%), though they deemed Mandarin (37%) to be the most important language in Malaysia, followed by English (25.9%) and Malay (25.9%). However, 44.4% of the

parents all agreed that Malay is the second most important language in Malaysia, outstripping English (14.8%) and Mandarin (29.6%). The staunch belief in Mandarin and Malay as first and second most important language in Malaysia, is evident in the number of parents who are neatly divided in their preference for enrolling their children in Chinese national-type schools (50%) as compared to Malay national schools (50%). Nevertheless, 88.9% of the parents agreed that proficiency in English would result in having more educational opportunities, and also better job opportunities (85.2%). More than half of the parents (51.9%) also commented that a good mastery of English would result in economic advancement. It is thus apparent that despite their steadfast support and promotion of Mandarin, most parents acknowledged the advantages that would result from mastery of the English language. This belief could possibly impact their perspectives and support for the amendment of the education act.

With the change in education policy, it is imperative to explore the home support that children received with regard to coping with the new challenges. According to the survey, 92.6% of the parents checked and monitored their children's progress, with the majority of them (74.1%) choosing to review their child's work with him or her. In addition, parents sought to support their children through employing private tutors (37%) and sending their children to tuition classes (48.1%). Despite the high proportion of home support, 55.6% of the parents believed their children to be having difficulties adjusting to learning Mathematics in English, compared with the higher percentage (63%) for Science in English. Likewise, 66.7% of parents reported that their children seek help from teachers and tutors when they encountered difficulties in learning Math and Science.

One-third of the parents suggested that schools set up tuition classes in English, Math and Science in English to help their children improve on their academic performance in the learning of Mathematics and Science in English. Alternatively, 14.8% of the parents recommended improving teaching resources and facilities while others suggested that schools focus on the teaching of English as a subject. One parent urged for a return to the original education policy when Mathematics and Science were taught through mother tongue as the medium of instruction.

The information gleaned from the survey of parents represents only part of the picture. To obtain a more complete view and holistic understanding of the issue, I included the survey conducted by United Chinese School Teachers' Association of Malaysia (henceforth to be termed according to its Chinese name-Dong Jiao Zhong) that is described below.

4.2.1.3 School Survey

The study carried out by the Dong Jiao Zhong, investigated the challenges which the 2002 Amendment to the Education Act (with its accompanying 2-4-3 scheme) posed for Chinese national-type primary schools in Malaysia. 282 Chinese national-type primary schools all over the country were surveyed in 2005 and the early part of 2006, and the results were disseminated to the public on 25th May 2006 as well as being published in the 2007 edition of "The Suitability of English Teaching of Mathematics and Science" by the above mentioned association. As Dong Jiao Zhong is a coalition of all Chinese school committees and school teachers associations, they were able to get full cooperation from the Chinese national-type schools and hence, obtain an in-depth portrayal of the impact of the new education policy on Chinese schools, their teachers

and students. This survey provided information on the effect of the policy on the students with regard to their performance (academically and otherwise) in Science, Mathematics and English. It also gathered information on the quality of teaching and the challenges facing teachers, as well as schools' perspectives on the implications of the policy change on the character of Chinese schools, as well as soliciting parents' views.

The first section of the survey covered students' progress in learning. 75.2% of the schools surveyed expressed that learning the same content twice (through the repetition of the Math and Science lessons in English and Mandarin) has resulted in confusion, boredom and disinterest in learning Mathematics and Science, and hinders the students' progress in these two subjects (see Appendix L). Additionally, 97% of the schools reported that the 2-4-3 scheme (under the amended policy) had added to the students' workload and stress, through additional investment in learning, increased class time, extra assignments and assessments. Of the schools, 98.2% noted that students' mastery of English is not adequate to cope with the learning of Mathematics and Science in English, though only 32.3% stated that students' interest in learning Mathematics and Science in Mandarin has been indirectly affected. This information is congruent with the percentage of schools (59.9%) that affirm that students perform better in Mathematics and Science assessments in which the medium-of-instruction is Mandarin. Similarly, 39% of students' mastery of Mathematics and Science has been negatively affected. In line with the above findings, 82.3% of the schools attested that students participated more actively and perform better during Mathematics and Science lessons in Mandarin, the exact opposite of what took place during Mathematics and Science lessons conducted in English. Conversely, 69.5% of the schools observed that students' English vocabulary

has increased though there had been no significant improvement in other aspects of English language skills such as reading, listening, writing and speaking etc. It is thus apparent that the change in education policy has negative implications for students, coupled with no significant improvement in the standard of English.

Similarly, 71.3% of the teachers were negatively impacted by the new educational policy due to increased workload- such as the addition of extra periods, the increase in investment of time and effort into lesson preparation- and the psychological burden. Schools also pointed out that the time teachers spent teaching Mathematics and Science in Mandarin and English, is insufficient due to the reduction in Mathematics and Science periods. This phenomenon has resulted in teachers racing through the syllabus, thereby affecting students' progress in learning Mathematics and Science. As such, the incongruence between the number of periods allocated to the teaching of Mathematics (four periods) in English for Chinese national-type schools as opposed to the seven periods that national and Tamil national-type primary schools enjoy (despite the identical textbooks and syllabus employed) has given rise to a scenario whereby it is nearly impossible to finish teaching the syllabus. Thus, 76.2% of the schools admitted that they increased teaching periods or have extra lessons outside the normal timetable.

In view of the above information, it is inevitable that schools and the Chinese community perceive this latest change in education policy to be a threat to Mandarin and the Chinese national-type schools. As such, 94.3% of the schools claimed that their students' mastery of Mandarin has decreased. Moreover, 61.7% of the schools expressed the fear that the character of Chinese schools would be changed and development of Chinese education affected. Meanwhile, 46.5% of the schools worried that if the current

educational situation continued, the transmission and maintenance of the Chinese culture and tradition would be affected. Thus, 31.9% of the schools urged the Malaysian Government to rescind the 2002 Amendment to the Education Act, a move supported by 23% of the parents.

The information gleaned from surveys of nearly all parties directly involved in the implementation of the amended education act offers an illuminating insight into the issue. It is hoped that, when combined with the documentary evidence and the informal discussion, the effects of the change in education policy (in respect to the Chinese community) can be presented in its totality.

4.2.2 Documentary Evidence

4.2.2.1 Newspaper articles.

Part of my enquiry into the implications of the change in education policy for the Chinese community involved an examination of newspaper evidence spanning five years, starting from May 2002, when the new educational policy was first introduced, to April 2007. The newspaper articles are collated from Nanyang Siang Pau, a Malaysian Chinese newspaper, originally founded in 1923 by a Chinese philanthropist. In 2001, the Nanyang Siang Pau was bought by an investment arm of the political party, the Malaysian Chinese Association (MCA), which is one of the three major parties (the other two being UMNO and MIC- Malaysian Indian Congress) that make up the ruling Barisan Nasional (CNN, 2001, n.p). The MCA is often perceived by the Chinese community to be bowing to the dictates of the dominant UMNO (United Malays National Organisation), and sidelining Chinese interests. Thus, a study of the Nanyang Siang Pau would offer articles that both favour and oppose the implementation of the 2002 Amendment to the Education Act. As

the number of newspaper articles is very large and the issues discussed are vast and far-ranging, only articles directly relevant to the implementation and implications of 2002 amended act for the Chinese community, were examined.

The newspaper articles under examination span five years in total and 899 newspaper articles deemed to be directly relevant were selected after preliminary elimination. The newspaper articles could be divided into five major sections: Reasons for implementing the 2002 Amendment to the Education Act; problems associated with the implementation; support for schools and teachers; response to the new education policy; and recommendations for implementation (see Appendix K).

A review of the reasons given by the Government and the Ministry of Education for the implementation of the change in education policy demonstrates that the majority of the articles (32.5%) list, “English is the language of commerce, knowledge and international communications” as the reason behind the decision to implement the new educational policy (refer to Table 5). Next, are the reasons, “To raise English standards” (30.2%) and “To improve global competitiveness” (30.2%). 27.9% of the articles cite “English is the language of ICT-Information Communications Technology”, followed by “English is an international language” (23.3%) and “English is the language of Mathematics and Science” (20.9%). The rationale behind the decision to implement the 2002 Amendment to the Education Act is crucial for an understanding of the responses of the Chinese community in relation to the policy. It is apparent from the information garnered that the Government’s decision to amend the 1996 Education Act is based on instrumental premises.

Table 5

Rationale for Implementation of 2002 Amendment to the Education Act	No
English is the language of commerce, knowledge and international communications	14
To raise English standards	13
To improve global competitiveness	13
English is the language of ICT-Information Communications Technology	12
English is an international language	10
English is the language of Mathematics and Science	9
Acquiring knowledge through translated materials led to inferior learning, manpower and time wastage	5
Lack of English proficiency resulted in high jobless rate among graduates	4
Improve standards of Mathematics and Science	4
Globalization and borderless community	3
Communicate with international community	2
Help in country's development	2
Improve Malays' competitiveness and status	1
To raise English standards	1

Note: Articles may cite more than one reason.

Under the section titled, “Problems associated with the implementation in Chinese schools”, the top three problems listed are: delay in the publishing and delivery of textbooks and teaching resources (16.9%); logistical problems such as timetabling (14.1%); and difficulties in completing syllabus (14.1%) (refer to Table 6). Lack of qualified English teachers and lack of teachers who are competent in teaching Mathematics and Science in English are also major problems cited in the newspaper articles. These problems showcase the deficiencies of the new educational policy, giving ammunition to opponents who charged that the new educational policy was not well

planned and was too rushed, with little input from both international and local experts. Besides, little research had been undertaken regarding the feasibility of the policy. All these factors, the opponents argued, have contributed to Chinese students' learning difficulties and marginalized Chinese education.

Table 6

Problems associated with Implementation of 2002 Amendment to the Education Act	No
Delay in the publishing and delivery of textbooks and teaching resources	12
Logistical problems	10
Difficulties in completing syllabus	10
Lack of qualified English teachers	9
Lack of teachers who can teach Mathematics and Science in English competently	8
Danger of repetition leading to boredom and disinterest	6
Gap between rural and urban schools widen	6
Problems with operating ICT equipment and resources	5
Teaching resources developed only in English	5
Lack of teaching resources and facilities	4
Appropriateness of textbooks for Chinese schools	2
Frequent absences of teachers due to training	2

Note: Articles may cite more than one problem.

Nearly half of the newspaper articles organized under the “Support for teachers and schools” section allude to teacher training as the prime source of support for teachers and schools, followed by the provision of information communications technology (henceforth termed ICT) equipment and resources (25.2%) and monetary incentives for teachers of Mathematics and Science in English, and English (13.5%) (refer to Table 7). In total, there are approximately 28 types of support offered by the Government to

schools; however, not all support is appropriate or sufficient for the Chinese national-type primary schools that struggle with issues different from that of the national schools. In fact, the Chinese associations raise funds for the publishing of textbooks and purchase of teaching resources appropriate for the Chinese national-type primary schools, as well as the designing of software for teaching students in Chinese schools.

Table 7

Support for Schools and Teachers	No
Teacher training	66
Provision of ICT equipment and resources	39
Monetary incentives for teachers	21
Resources	16
New textbooks and workbooks	13
Tuition vouchers and tuition classes	9
Hiring retired teachers who are qualified to teach Mathematics and Science in English	7
Translate existing teaching resources into English	7
Invited international experts to assist in the implementation and training of local teachers	7
Websites and hotlines set up to answer questions	6
Monitors the implementation in schools	6
Funding	6
Curriculum planning and writing	5
Assess teachers' skills and qualifications	4

Note: Articles may cite more than one type of support.

Response to the new educational policy was the focus of the bulk of the newspaper articles. Out of the 899 articles examined, 513 or 57% were related to responses to the new educational policy. The articles are divided into two main sections-

responses that show evidence of support as compared to responses that show evidence of opposition. 55 articles showed evidence of support by the Chinese community leaders for the implementation of 2002 Amendment to the Education Act, with 14 (or 16.5% of all positive responses by Chinese community leaders) articles citing support based on the premise that it would help in raising the standards of English and nine articles which state that mastering English is the fastest and easiest route to acquiring knowledge and information from the various realms (eg. Mathematics and Science). Meanwhile, 326 articles or (63.5% of all articles pertaining to response to educational policy) reveal evidence of strong opposition by the Chinese community and its leaders towards the implementation of the amended education act (refer to Table 8). Ninety-nine of the articles approved of the Government's efforts in trying to raise the standard of English but oppose the teaching of Mathematics and Science in English as the solution to improving English standards. Forty-eight articles contend that mother tongue is the most direct and effective medium for educating young children. As follows, 70 articles urged the Government to reconsider and maintain the use of mother tongue as the medium of instruction, and 35 of the articles advocate the maintenance of mother tongue for Mathematics and Science in national examinations (see Appendix E). It is clear that there is strong opposition by the Chinese community towards the implementation of the new policy, although there is agreement among the Chinese community regarding the acknowledged importance of English and the need to improve English standards. The opposition to the new educational policy however, does not subscribe to the Government's rationale that the use of English to teach Mathematics and Science is the best route to achieve higher English standards.

Table 8

Negative Responses by Chinese community	No
Agreed with Government's efforts in raising standards of English but opposed to the teaching of Math and Science in English.	108
Maintain the use of mother tongue for teaching all subjects or Math/Science	74
Mother tongue is the most direct and effective medium for educating young children	53
Maintain the use of mother tongue as medium of instruction for Math/ Science in assessments	40
Change the character of Chinese schools	35
Against educational principles	32
Focus on raising the standards of English through teaching as a subject	27
Harm the educational progress of students	20
Math and Science results in Chinese schools have always been above national average	19
Focus on raising standards of English through the training and improvement in quality of teachers	17
Increase class time for English	15
Using a foreign language to teach conceptually difficult Math and Science increases obstacles	6

In respect to their opposition to the use of English to teach Mathematics and Science, the opponents to the new educational policy gave recommendations for improvements to policy in 60 newspaper articles. The majority of the newspaper articles (30%), recommended that the Ministry of Education increase English class time. 21.7% of the newspaper articles also recommended improving the quality of English teachers and teaching.

To conclude, the newspaper articles not only provided for a contextual understanding of the issues inherent in the implications of the 2002 Amendment to the Education Act, it also provided for different perspectives, as well as an in-depth exploration.

4.2.2.2 Textbooks

An analysis of the textbooks in use in Chinese national-type schools also served as supplementary evidence for an exploration into the implications of the 2002 Amendment to the Education Act for the Chinese schools. As such, four textbooks in Mathematics and Science, are analysed for evidence that pertains to teaching and student learning.

4.2.2.2.1 Mathematics Textbooks

The four textbooks selected for content analysis are drawn from Primary 5. The first book, entitled “Mathematics Textbook Year 5” is written in English, and published in 2006. The 3 writers are non-Chinese, as is the publisher, a Malay company. In comparison, *Shuli Keben: Wunianji -Shangce* (Mathematics Textbook: Primary 5, Book A), is written in Mandarin, published in 2006 and the sole writer is Chinese, as is the publisher. A comparison of the contents (in terms of similarities and differences) is undertaken, based on the following factors: topics; number of pages; concepts taught; skills taught; number of examples; number of practice questions; number of revision questions; number of information communications technology (ICT) resources cited for use; number of illustrations; and number and type of activities.

A comparison of the topics in the two textbooks (see Appendix I) demonstrates that the five topics in both textbooks are exactly the same, though the number of pages in each topic differs. Likewise, the concepts taught in the two textbooks are the same, though one chapter differs in the skills taught. In Chapter One of the Chinese Mathematics textbook, the writer introduces reading of the abacus, a skill that is not evident in the English textbook. In terms of the number of examples, the two textbooks

differ as well, with the Chinese version (189 examples) outstripping the English version (114 examples) by 75 examples. The examples used are also vastly different, as is the number of examples allocated for the teaching of the different concepts. This same scenario surfaces in the practice and revision questions sections.

When the number of practice questions is compared, it obvious that the Chinese textbook once again has more practice questions (659) than the English textbook (479), though there are more problem sums in the English textbooks. The number of practice questions and problem sums allocated to the teaching of each concept again differs between the two textbooks, as are the questions asked. Similarly, there are more revision questions and problem sums in the Chinese textbook (611 and 65) as opposed to the English textbook that has only 174 revision questions and 17 problem sums (in the revision sections). Conversely, the English textbook has more ICT resources (such as websites and CDROMs) cited for use. The English textbook has a total of 18 CDROMs references and 22 website citations as compared to the Chinese textbook which has only five website citations.

In regard to illustrations, the Chinese textbook has 167 illustrations compared to the English textbook with its 118 illustrations. The illustrations in both books mostly differ in subject and design, occasionally even differing in race. No two illustrations in the two books are exactly the same. As for the activities inherent in the two textbooks, the English textbook has a wider variety of activities compared to the Chinese textbook, which only introduces the use of Mathematics in creative storytelling. The English textbook has pair/groupwork activity, Mathematics puzzles and Mathematics projects.

A comparison of the two textbooks shows that despite the great number of ‘apparent’ differences between the two textbooks, the basic concepts and skills taught are exactly the same.

4.2.2.2.2 Science textbooks

Similarly, the two Science textbooks are drawn from Primary 5. The first textbook, “Science Textbook Year 5” is written in English, and published in 2006. The four writers are all Malay, as is the publisher, which is the same company that published the Mathematics textbook. In comparison, the *Wunianji Kexue Keben (Shangce)* (Science Textbook: Primary 5, Book A), is written in Mandarin, published in 2007 and the three writers are Chinese, as is the publisher. A comparison of the contents (in terms of similarities and differences) is undertaken, based on the following factors: topics; number of pages; concepts taught; terminology; number of practice questions; number of assigned work in the workbook; number of information communications technology (ICT) resources cited for us; number of illustrations; number of activities; and number of experiments.

A content analysis of the two textbooks reveals that the topics and concepts taught are exactly the same (see Appendix J). However the number of pages differs as well as the number of terminology introduced. Additionally, the scientific terms introduced are mostly different. The number of practice questions found in the two textbooks also differs, with 52 practice questions found in the Chinese textbook as opposed to the 35 in English textbook. The practice questions in the two textbooks are also mostly different in terms of the concepts assessed. Similarly, the Chinese textbook assigned more work in the workbook (14) when compared to the English textbook (11). However, like the

Mathematics textbooks, the English version of the Science textbook makes more use of CDROMs (20) and has eight website citations compared to the Chinese textbook which does not make use of any CDROMs, but depends heavily on website citations (14). In addition, the Chinese textbook has 339 illustrations as compared to the English textbook with 309 illustrations. The illustrations like those in the Mathematics textbooks, are different not only in terms of the subject, but also the design. The Chinese textbook has nine activities in contrast to the 12 in the English textbook, with some being group activities. The English textbook too has more experiments (11) when measured against the nine experiments in the Chinese textbook. From the analysis, it is evident that both the activities and experiments in the two textbooks are very much different.

Basically, there are many differences between the two textbooks, however the basic concepts taught and the topics are exactly the same. However, unlike the Mathematics textbooks, there is a higher degree of difference, due to the difference in terminology introduced.

In summation, the great similarities in both the concepts and skills taught in both Mathematics and Science textbooks played a pivotal role in obstructing pupils' learning that resulted in far-reaching implications for the development of Chinese education. As such, results of the content analysis of the four textbooks greatly facilitated the answering of questions regarding the challenges that the implementation of the new educational policy brought, as well as, student performance.

4.3 Informal Discussion

The evidence discussed in the above sections is skewed towards breadth, in terms of the range of issues discussed, thus, in this section, I attempt to provide depth to the

research through a discussion with two educators, so as to probe deeply into the specifics of some of the issues that are discussed in earlier sections.

The first educator I spoke with is a female principal in her 40s. She is the principal of a small, double-session, inner-city Chinese national-type primary school, with a population of only a few hundred. The discussion took place in her office in the summer of 2007, and was conducted in a mix of English language and Mandarin. She has been a principal of that school for a short period of time, and was promoted from vice-principal three years ago in 2004. Before becoming a vice-principal and principal in the school, she had taught for approximately 20 years and she had taught all subjects (as is normal in most national-type primary schools where the number of teachers allocated by the Ministry of Education has always been insufficient). Initially though, she did not teach Science subjects, but later she added Science subjects to her teaching repertoire, which was comprised of subjects such as Geography, History, Moral & Civics etc. Like most of her contemporaries, she had her primary education in a Chinese-medium school, after which she attended English secondary schools (before they were gradually converted to Malay national schools in the 1970s). Tertiary education was obtained in Malay language, as all national universities taught in the medium of Malay.

The second educator I spoke to had a somewhat different profile from the first educator. Besides being a staff member of the same school, she is a senior teacher and in her 50s. She has taught for 31 years, with 18 of those years spent in the school where she is currently teaching. Her primary and secondary school experiences had been solely with the English medium schools. In our discussion, she tends to use mostly English (with occasional code-switching between English, Malay and Mandarin) that she learnt in

school. However she felt that she is only somewhat competent in her proficiency in English language, as she had to learn three languages (English, Malay and Mandarin) during her schooling. She admits to using mixed code very often.

The issues raised in the general discussions focused on classroom teaching; student's learning and performance; support; implementation in Chinese schools; and implications for Chinese schools. These issues would help in providing input for the formulation of the framework for, as well as serve to illuminate, the discussion of the themes emerging from the synthesis and integration of the various evidence presented in the above sections. The themes are discussed in the second section that is to proceed below- Emerging Themes.

4.4 Emerging Themes

As mentioned in Chapter 3, the themes were derived from patterns emerging from the literature review, which then formed the basis for pre-established themes. On further analysis of the data drawn from the surveys, the documents and informal discussions, commonalities were identified, and unified to form integrated themes, that were further refined and expanded within the larger framework of the research questions.

The themes discussed are organized into two sections: The 2002 Amendment to the Education Act and Chinese national-type schools, and Political compromise versus Language rights: A Community's response. The first section is further subdivided into two subsections: changes and problems that are a consequence of the change in education policy, and support for school and teachers. The second section is divided into four subsections: educator perspectives and attitudes; student perspectives and attitudes; parent perspectives and attitudes; and summation of a community's responses.

4.4.1 The 2002 Amendment to the Education Act and Chinese national-type schools

4.4.1.1 Challenges

It is evident from the various strands of data presented earlier, that the implementation of the 2002 Amendment to the Education Act has brought about many changes to the existing education system in Chinese national-type schools. Often, these changes brought with them teething pains, especially when unleashed on an unprepared population. The amended education act is the result of a hasty decision as it was announced on 11th May 2002 (without prior research and planning) and implemented on Jan 2003, with only half a year to prepare for the implementation (Nanyang Siang Pau, 10/5/2002, n.p). According to the principal in her conversation,

The Ministry of Education, the teachers, schools and students were not prepared for the change in policy initially...Most of the parties involved were not solicited for their opinions on the planning of the policy. In addition, all parties involved (other than the Government) had no idea how to implement or execute the policy, and they were caught unprepared for it. They waited for the Government to take the lead as there were many contradictory reports in the newspapers regarding the specifics of the new policy.

In addition, most of the challenges that the Chinese education system faced, are particular to the Chinese education system as the initial plans for the teaching of Mathematics and Science in English did not include national-type schools. The policy only targeted national schools (Nanyang Siang Pau, 19/5/02, n.p). Given the inherent differences between the national and the national-type schools, the change in the medium-of-instruction policy assumes a different mantle in the Chinese national-type schools. However, to understand the unique challenges that greet the implementation of the new educational policy in Chinese national-type schools, it is necessary to first identify the changes that have been wrought.

4.4.1.2 Completion of Syllabus

In a bid to protect the Chinese character of the Chinese national-type schools, a compromise has been reached between the different parties, the government and the Chinese political interest groups, and subsequently, the “2-4-3” scheme for Primary 1 to 3 was born (Nanyang Siang Pau, 31/10/2002, n.p). In 2005, the second phase of the 2002 Amendment to the Education Act was introduced after negotiations, giving rise to the “6-2-3-2” scheme for Primary 4-6 (Nanyang Siang Pau, 23/12/2005, n.p). Under both the “2-4-3” and “6-2-3-2” schemes (see Appendix G), reshuffling of the subjects (introduction of new subjects and periods allocation) and the medium of instruction took place, creating both teaching and learning challenges for teachers and students.

One of sub-themes that recurs throughout analysis of data is the inability to finish the syllabus, a common thread running through the surveys (parent and the DJZ), newspaper articles and the informal discussion. As reported in earlier sections, “difficulties in completing the syllabus” is cited as one of the top three problems (referred to in 12.7% of all associated articles) with the implementation of the new education policy in Chinese schools. When discussing problems in implementing the policy in her school, the principal commented on the ‘source’ of the problems,

The initial implementation was very tough. Time is very limited, especially in the 2nd phase, under the 6-3-2-3 scheme. Originally, Science was taught in Mandarin and comprised of five periods. Now it has become three periods of Science in Mandarin and two periods of Science in English. Likewise Math has increased from seven periods in Mandarin to eight periods overall, but with six periods in Mandarin and two periods in English.

Additionally, she highlighted the difficulties the teachers faced with the onslaught of the changes in the educational policy,

Teachers had to follow Ministry of Education's policy and instructions, thus the number of periods (such as Science in Mandarin) was reduced for the addition for new subjects (Science in English). The teachers could not finish the syllabus on time as there is no reduction in syllabus. The teachers have to conduct extra remedial lessons for their students so as to complete the syllabus on time. But often times, there is insufficient space or time for teachers to conduct these lessons (as it is a double-session school).

It was a sentiment echoed time and time again by teachers and schools. The survey by Dong Jiao Zhong found that 81.6% of the schools expressed that, due to the reduction in teaching periods of Mathematics and Science that use Mandarin as the medium-of-instruction, the teachers' teaching time was insufficient. They had to rush through the syllabus, thereby affecting students' progress in learning Mathematics and Science. As the senior teacher in the discussion lamented:

There is no time to finish the syllabus...The number of periods teaching Mathematics and Science in Mandarin has been reduced but the content has remained the same.

Not only has the content remained the same despite the reduction in the number of periods allocated, the teachers had to teach the same amount of content in an even lesser number of periods that is allocated to the teaching of Mathematics and Science in English. In the survey conducted by Dong Jiao Zhong, it asked 282 schools about the impact that the different number of periods allocated for Mathematics in English (four periods under the 2-4-3 scheme in Chinese national-type schools as opposed to the seven periods in national schools) have on the performance of the Chinese schools, when the same textbooks are being used for both medium-of-instruction schools. 65.6% of the schools confessed that the teachers tried to rush through the syllabus. The inevitable result is that students had difficulties in understanding the lessons, a reasonable consequence when

one compares and analyses the Mathematics textbooks (in both Mandarin and English). From the discussion of the textbook evidence presented earlier, the textbooks (in different language mediums) teach exactly the same topics, concepts and skills, thus posing great difficulties (especially for the 6-2-3-2 scheme) for the completion of the syllabi, for example, the Science syllabus in Chinese national-type schools has allocated three periods in Mandarin and two periods in English but yet it has to complete a five-period syllabus (five periods are allocated to the teaching of Science in English in national schools). It is thus not surprising that 45.5% of the schools surveyed by Dong Jiao Zhong, stated that completing the syllabus on time was an impossibility given the number of periods allocated. Thus, rushing through the syllabus became a common refrain among Chinese national-type primary schools, leading to one of the surveyed parents urging schools to

Give children sufficient time to learn and process the lessons. There is no need to rush through the lesson.

To avoid the impetus to rush through the syllabus, and yet complete the syllabus on time, 23.8% of the schools admitted that they needed to either increase teaching periods or have extra lessons outside formal class time. From the comments (33.3%) on the parent survey, it is obvious that this ‘solution’ is fueled in part by parents who call for the schools to increase class time and organize extra lessons after school.

4.4.1.3 Repetition of Lessons

A second pattern emerges when one analyses data relevant to the 2002 Amendment to the Education Act. The repetition of the lessons in both Mandarin and English is a major impediment to the effective teaching and learning of Mathematics and

Science, a problem noted by 8.5% of the associated newspaper articles. As described by a newspaper article, often the contents in the Mandarin textbooks are merely a translation of the English version. In actuality, two languages are used to teach the same contents (Nanyang Siang Pau, 4/3/2003, n.p). As evident in the analysis of the different language medium Mathematics and Science textbooks, the respective textbooks are the same in terms of crucial elements such as topics, concepts and skills taught. They differ mainly in stylistic ways such as the type and number of illustrations, practice questions and number of examples etc. As the senior teacher remarked,

The lesson plan is a repeat, only using different languages (to execute the lesson plan).

Thus it is not inconceivable that 40.4% of the schools surveyed highlighted that their students felt bored and lost interest in learning with the repetition of the Mathematics and Science lessons in English and Mandarin. Echoing that observation, a retired female principal in an interview with Nanyang Siang Pau agreed that the Phase 1 (2-4-3 scheme) of the amended act, in which Mathematics and Science teaching in English is a mere repetition of the teaching of Mathematics and Science in Mandarin, had resulted in double-learning and boredom, as well as disinterest (Nanyang Siang Pau, 16/10/2005, n.p). In addition, 60.3% of the schools felt that the repetition of the lessons in different languages caused the students to feel confused and hindered the learning progress.

4.4.1.4 Marginalization of Mandarin and the Chinese schools' identity

A third sub-theme that emerges from the collation and analysis of data is the increasing marginalization of the Chinese language, which consequently posed a challenge to the maintenance of the Chinese character of the Chinese national-type

schools. Prior to the implementation of the 2002 Amendment to the Education, out of the nine subjects taught (in Primary 1-3), only two were not taught through the medium of Mandarin. Under the 2-4-3 scheme, nearly half of the subjects are taught through the medium of Malay or English (Nanyang Siang Pau, 30/7/2002, n.p). Furthermore as the principal lamented in our conversation,

Subjects (eg. civics and morals and Mandarin) using mother tongue as medium of instruction had seen their periods reduced. In addition, Mathematics and Science (in Mother Tongue) had their periods reduced too (for the introduction of English, Mathematics and Science in English under the 2-4-3 scheme).

Ultimately, only one subject out of the five examinable subjects is conducted solely through the medium of the mother tongue. Before 2008, Mathematics and Science would be conducted in both English and Mandarin (Nanyang Siang Pau, 30/7/2002, n.p). It is therefore not surprising that 72% of the schools commented that the reduction in the number of periods in mother tongue had directly affected the students' learning, resulting in diminishing mastery of Mandarin. According to 41.1% of the schools surveyed, students' stress had increased as a result of additional time and effort spent in acquiring English and the learning of Mathematics and Science in English, resulting in a decline in interest in learning Mandarin.

The increasing marginalization of Mandarin, induced fears in the Chinese community, that the differences between Chinese national-type schools and national schools were being gradually diminished. Indeed, this fear is well founded as the parent survey showed that there are an equal number of parents (see Appendix G) who would prefer to enroll their children in Malay national schools compared to Chinese national-type schools. 28.6% of students surveyed, too want other subjects (besides Mathematics

and Science) to be taught in English. As such, 35 articles (refer to Table 6 in Section 4.2.2.1) worry that the new policy would change the character of the Chinese national-type schools, irrevocably. Agreeing with this opinion are 61.7% of schools surveyed by Dong Jiao Zhong, who assumed that the character of the Chinese schools would be changed if implementation of 2002 Amendment to the Education Act should continue in its present form. 52.5% of the schools predicted that if the current situation should continue, it would affect the transmission and maintenance of Chinese culture. As the Association for Taiwanese University Graduates Association of Malaysia charged in a press release in *Nanyang Siang Pau*, the use of English language (a non-mother tongue) to teach Mathematics and Science is not only an academic issue, it concerns an ethnic minority's cultural transmission and survival (*Nanyang Siang Pau*, 2/8/2002, n.p). As the principal claimed,

This policy is rushed. So there are problems...All the organizations were not prepared. The government should take four to five years to plan this policy prior to implementation.

The implementation of the 2002 Amendment to the Education Act has brought about huge changes to the current educational system in the Chinese schools, and a unique set of challenges. The effectiveness of this change of policy in Chinese national-type schools still remains to be seen. However, the Ministry of Education, in an effort to ensure the success of the new education policy had instituted a series of measures to support schools and teachers, a feature that we would examine in detail in the next section.

4.4.1.5 Support for school and teachers

To cope with an almost overhaul of the medium-of-instruction policy, the government set aside nearly RM\$500 million into ensuring the smooth and effective

implementation of the policy change (Nanyang Siang Pau, 20/9/2002, n.p). As evidenced by Table 5 in Section 4.4.1.5, the Ministry of Education had employed a diverse range of measures. It was obvious however, that the focus of their support is teacher training

4.4.1.5.1 Teacher training

A striking pattern that emerges from the cross-analysis of the evidence is the training of teachers. Out of a total of 155 articles in Nanyang Siang Pau that discusses support for teachers and schools, 40% of them are associated with teacher training. It thus appears that teacher training is a very crucial factor in the success of the new educational policy. The Ministry of Education is not the only party to emphasize the need for teachers to be trained (so that they are equipped to deal with the challenges of the new policy), parents also appeared to concur with it. Two parent respondents in the parent survey recommended that more training for teachers be conducted and more opportunities to upgrade be offered to teachers. The need for teacher training is especially pertinent, considering,

Most teachers who attended school after 1958 were mostly taught through the Malay language. Thus all Primary 1-6 teachers (of Mathematics and Science) have to attend the ETeMS course (English for teaching Mathematics and Science). Training courses are conducted during weekends and holidays. Ministry of Education introduced a 30 day diploma course for teachers (Principal).

As stated by Nanyang Siang Pau, there are two phases to the ETeMS training course. Phase 1 focuses on the acquisition and mastery of language skills. Phase 2 concentrates on the teaching of Mathematics and Science in English. Each phase is comprised of five modules that total 60 hours and a 5-day module of 30 hours (Nanyang Siang Pau, 26/12/2002, n.p). To ensure the validity and effectiveness of the training courses conducted for teachers, the Ministry invited 23 international consultants and experts to

assist in the implementation of the new policy and the training of local teachers. The foreign experts also consulted for state education boards, provided advice and guidance for English training courses (Nanyang Siang Pau, 6/9/2002, n.p). However, when asked about the training for teachers, the principal remarked,

Initially, many teachers were reluctant to go for training. The Government to encourage the teachers, gives an allowance for the ETeMS course, which amounts to approximately 10% of the teacher's salary. After the allowance scheme was implemented, (many) teachers wanted to attend.

Unfortunately, as reported by Dong Jiao Zhong in their survey, 60.6% of the Chinese schools reported that as teachers who taught Mathematics and Science in English were given an allowance, it has resulted in dissatisfaction among other teachers in schools, leading to internal conflicts. Additionally, 44% of the schools pointed out that the policy of giving allowance for Mathematics and Science teachers (in English) had resulted in many teachers (be they competent or not in the teaching of the respective subjects in English) competing to teach these two subjects, leading to difficulties for the principals when assigning teachers. According to Nanyang Siang Pau, training courses are also often conducted during teaching days, resulting in an average of 20% of teachers teaching Mathematics and Science (in English) being absent from the classroom (Nanyang Siang Pau, 2/10/2003, n.p). As the frustrated principal admitted,

Teachers need more training but the training may affect the progress of lessons.

The senior teacher, when questioned about the need for more training, had this to add,

There is probably no time as there are too many activities in school.

Contradictory to its aim to improve teaching and student learning, teacher training may in fact be hampering students' learning. Inferring from the principal and senior

teacher's remarks, teacher training may not be a high priority among some teachers, as it takes the teacher away from the classroom and school too often, thereby not only resulting in negative implications for the students and teaching, but also creating logistical problems as principals have to deal with the frequent absence of their staff.

In addition to the problem mentioned above, some teachers also spend lots of time away from their teaching and the classrooms, doubling up as local trainers for other less experienced teachers. Besides employing foreign experts to assist in the implementation of the policy and training, the Ministry of Education also employed 200 local trainers. The Curriculum Development Center too deputized 1590 trained teachers to undertake the responsibility of being a 'master teacher'. These 'master teachers' are responsible for communicating the latest news regarding curriculum changes and transmitting the latest teaching strategies (Nanyang Siang Pau, 10/12/2003, n.p). However, as remarked by the displeased principal,

Even the experts conducting the training come from the schools as the Ministry of Education will send a letter to each and every school to appoint two teachers to train other teachers in the teaching of Mathematics and Science in English. This appointment is compulsory despite the fact that the two teachers appointed might not demonstrate good mastery of English.

In view of the above findings, it is apparent that despite the abundance of training and the huge investments in time, efforts and funds, the teacher training program is not without its flaws. There are certainly more than a few kinks to iron out. Nonetheless, the Ministry hoped to compensate for some of these deficiencies with support through teaching resources.

4.4.1.5.2 Teaching resources

Another theme that received a lot of attention in the various evidences analysed and, a linchpin in the Ministry of Education's masterplan for school and teacher support is teaching resources. Out of the 155 articles that discussed support for schools and teachers, 40% of the articles mentioned either investment in or the design of teaching resources for teachers and schools. Five parents in the parent survey conducted, urged the government to improve on teaching resources and facilities, as well as increase the usage of ICT for teaching. It was a recommendation that the Government had already taken up. As Nanyang Siang Pau reported in its article, the Ministry had allocated RM\$5000 to RM\$15000 of initial funding to each of the primary schools in the country to help prepare their ICT infrastructures for the implementation of the policy. Besides that, all Mathematics and Science (in English) teachers are allocated a laptop, an LCD projector etc. According to Nanyang Siang Pau, so far, 98% of all primary schools have received their ICT equipment, especially computers (3/1/2003, n.p). Besides that, teachers are also provided with computer software or other ICT resources to assist in the teaching of Mathematics and Science. Even if they have not acquired mastery in English or the teaching of Mathematics and Science in English (despite the training), the teachers would be able to teach by using the ICT resources. They need to merely be proficient in operating the computer program as they only act as facilitators (Nanyang Siang Pau, 25/8/2002, n.p).

Other than funding and the heavy use of ICT resources, bilingual vocabulary lists, teaching handbooks, books and non-ICT teaching resources are also some of the other

support developed by the Ministry for teachers and schools. All in all, the Ministry of Education developed 19 types of teaching resources (Nanyang Siang Pau, 28/7/03, n.p).

Despite the wide range of teaching resources available, there were many who focused mainly on using the textbooks to teach. Conversely, there are also those teachers who were over-reliant on the use of ICT (especially when they only need to act as facilitators during an ICT Mathematics or Science lesson as mentioned above). In such situations, ICT replaced teaching and the students become captive audience of educational television programs or computer software. Falling between the cracks are teachers (of Mathematics and Science in English) who had problems with operating the ICT equipment as reported by 49.2% of the schools in the Dong Jiao Zhong survey. As a study (in Nanyang Siang Pau) remarked, installation and operation of the ICT equipment are often very troublesome and time-consuming. Teachers usually needed about 10-15 minutes to start up the ICT equipment (Nanyang Siang Pau, 27/2/2003, n.p). This not only leads to increased boredom for the students who are idle while the teacher tries his or her best to set up and operate the equipment, it also contributes to inability to complete the syllabus. A comment by the principal in her discussion portrays the reality of support through provision of teaching resources very aptly,

MOE's solution is to use a lot of information communications technology. However, these are poorly maintained, and are often stolen. The Ministry spent a lot of money, but few benefits result.

4.4.1.5.3 Mentor scheme

The mentor or buddy system is another common thread weaving through the various evidences analysed. It has gradually gained favour as another 'bandage' to 'patch up' the deficiencies in the teacher training implemented. As the principal described,

There is also a buddy system put in place where a mentor - a teacher with good English knowledge or the HOD (Head of Department) of English, will aid teachers of Mathematics and Science (in the teaching of these subjects in English) (principal).

At the same time, these teachers (who are less proficient in English) had to free up four periods per month to meet up with their mentors to have an English language evaluation. The mentors had to write a report on the teachers' performance and submit it to the English HOD (Head of Department). Teachers who failed this assessment have to participate in the ministry's retraining project (Nanyang Siang Pau, 11/4/2007, n.p). This enforced assessment of the teachers teaching Mathematics and Science (in English) is most likely to add to the psychological burden and stress of the already beleaguered teachers, which 72.7% of the schools surveyed by Dong Jiao Zhong commented, are already suffering from having to invest more time into lesson preparation and the use of English as medium of instruction.

On review of the above discussion on the changes that swept through the Chinese education system with the implementation of the 2002 Amendment to the Education Act, and the unique challenges that that these changes brought upon the Chinese establishment, it is not surprising that this new policy attracted vehement response from the Chinese community (both negative and positive). The next section of this chapter deals with the themes regarding responses from the various Chinese stakeholders.

4.4.2 Political compromise versus language rights: A community's response.

As the 2002 Amendment to the Education Act sought to change the medium of instruction from mother tongue to English, it caused the Chinese community much concern. Being a minority, it had always striven to protect its language and heritage. In

the deal it brokered with the Malays, Indians and British for Malaysia's independence, it had to give up on equal rights for concessions on citizenship and the protection of its education and language (Abdullah & Chan, 2003, p.416). It is obvious that the Chinese guarded their right to mother tongue education and language jealously, fearing assimilation and marginalization. As such, their right to mother tongue education and to use their mother tongue has been enshrined in the Constitution. Thus, a move to 'interfere' in mother tongue education, is a surefire way to generate a flurry of heated responses from the Chinese community.

The volatile responses from the Chinese community had resulted in eventual compromise by the Government, and a revised version of the educational policy has been implemented in Chinese national-type schools (taking into consideration the Chinese community's concerns). It is thus imperative to analyse the Chinese community's responses towards the 2002 Amendment to the Education Act to understand the policy in regard to the community. This has been caused by the fact that the different forms the new educational policy assumed has brought about unique challenges that the Ministry of Education's 'one-size fits all' approach, (that it adopts in an attempt to rectify the deficiencies inherent in the amended education act) may prove futile or even create further challenges. As the new policy is due for a review by the Ministry in 2008, it is vital to study the Chinese community's experiences with and responses to the policy, so as to determine the viability of the policy, and/or areas where revisions could be made so as to make the policy a success for the Chinese community.

An analysis of the data revealed certain distinct themes that serve to illuminate my study on the responses of the Chinese community to the new education policy. The

themes are categorized as follows: educator perspectives and attitudes; student perspectives and attitudes; and parent perspectives and attitudes. A discussion of the themes will be presented next.

4.4.2.1 Educator perspectives and attitudes

The lack of research and preparation that went into the planning of the policy for the Chinese community (bearing in mind the unique character of the Chinese schools) had created unintended consequences with which many of the Chinese teachers are ill-equipped to grapple. Due to the need to switch from teaching Mathematics and Science solely in Mandarin, many now have to also teach the subjects in English. The teachers, themselves mostly educated in Malay as medium-of-instruction, may not have the capability to teach through English. An article in *Nanyang Siang Pau* raised questions about the teaching of Mathematics and Science in English, commenting that many Mathematics and Science teachers are not proficient in English; thus they are often unable to teach competently or creatively during lessons in English (*Nanyang Siang Pau*, 16/10/2005, n.p). The principal, observed,

Some teachers still lack English proficiency, and have no confidence.

This comment is consistent with the findings of the Dong Jiao Zhong survey that states that 72.7% of the schools expressed that teachers responsible for teaching Mathematics and Science in English had to invest more time and effort, leading to increased psychological burden. In addition, 71.3% of the schools noted that the teachers' workload was increased due to an increase in the number of periods.

More critical is the reduction in the number of periods for Mathematics and Science that resulted in 81.6% of the schools reporting that teachers rushed through the

syllabus, consequently, affected students' progress in learning. As the senior teacher criticized,

Time is too limited for we are required to teach Science in three periods (Mandarin three periods and English three periods). There is no time to finish the syllabus.

In view of the above challenges, it is of no surprise that although 70.9% of the schools expressed agreement with the need to raise English standards, however, they disagreed with the 2-4-3 scheme. They think that it not only contravenes educational principles, but also threatens the development of Chinese schools. Thus, 31.9% of the schools urged the Government to rescind the "2-4-3" scheme and reinstate Mandarin as medium-of-instruction in Mathematics and Science teaching and assessments. The principal recommended that,

Instead of teaching English through content (Mathematics and Science), the Ministry of Education should focus on English teaching. The extra periods should be allocated to the teaching of English. It should concentrate on the pedagogy, as students have no foundation (in English) and teachers have little confidence (in teaching Mathematics and Science through English).

In comparison, 18% of the schools (in the Dong Jiao Zhong survey) expressed approval for the policy, as not only do students continue learning Mathematics and Science in Mandarin, they also learn the two subjects in English, thereby improving their English standards. The senior teacher concurred,

It is a very good policy as English is used all the time. If there is no dual medium of instruction system, teachers would have problems teaching, as would students have problems learning, especially for the subject of Science.

It is evident that certain segments of the Chinese community are agreeable to the implementation of Mathematics and Science in English. It appears to be the best of two

worlds. Not only does the Chinese community retain the advantage of being instructed in these two core subjects in their mother tongue, they are also exposed to them in the English language, which is a relief if the Ministry should decide to confine the language medium, in UPSR examinations, to English. Swayed by the Government's arguments, segments of the Chinese community believe that this policy would be beneficial to the survival and prosperity of the Malaysia's Chinese community in an increasingly globalized world. This belief has led to worries from some Chinese educators about the potential damage that could be inflicted on the continued development of Chinese schools and Chinese heritage. To quote the principal,

The implementation of this policy could result in parents sending their children to national schools. One of the Government's main thrust (in recent years) has been to strengthen the national school, which is why it has started to introduce mother tongue languages in national schools.

With the differences between the national and the Chinese national-type schools narrowing (i.e. the introduction of mother tongue languages as a part of formal education in national schools and the teaching of Mathematics and Science in English in both mediums of instruction schools), the advantages or uniqueness of Chinese schools would be diminished. It would be similar to national schools in terms of curriculum and subjects offered. Thereby, there would be fewer reasons for Chinese parents to enroll their children in Chinese national-type schools if national schools are perceived to be offering the same education as the Chinese schools and possess more advantages as it has more periods of teaching in English. Additionally, the character of Chinese schools would change, as feared by a resounding 61.7% of the schools. A further 45.6% of the schools further worried that it would affect the transmission and maintenance of Chinese culture.

In general, most Chinese educators felt that the new educational policy is a political decision and has serious negative implications for the future and identity of Chinese schools as well as their students. They urge the government to look at the issue from an educational standpoint. As observed,

This policy is rushed. So there are problems...All the organizations were not prepared. The government should take 4 to 5 years to plan this policy prior to implementation (Principal).

4.4.2.2 Student perspectives and attitudes

The changes associated with the 2002 Amendment to the Education Act and the challenges it pose, also resulted in some serious repercussions for the focus of the policy—the students, affecting their perspectives and attitudes towards the respective languages and learning. Despite being educated under the new policy for a number of years, Mandarin is still the language of choice for most students. English, despite promotion by the Government, is the second language (38.1%) that students want to learn. As findings from the survey indicates, despite the high percentage of students who like learning English (76.2%), only 33.3% admit to enjoying learning Mathematics and Science in English. There also seemed to be little possibility that the students would approve of a decision to extend the use of English as medium of instruction to other subjects, as demonstrated by the evidence presented. In conjunction, 71.4% of the students felt most comfortable in learning Mathematics and Science in Mandarin. As reported by Nanyang Siang Pau, in UPSR 2005's bilingual assessment of Mathematics and Science, no students attempted to answer the questions in English (which is reasonable as they were enrolled prior to the implementation of the new educational policy). However in PMR (the Secondary 4 national examinations), only 27% of the students used English to

answer the Mathematics questions and 33% answered the Science questions in English (17/11/2005, n.p). Given that secondary students are instructed in Mathematics and Science only through the medium of English, this finding further demonstrates the preference for mother tongue medium-of-instruction.

The students' level of comfort in and preference for Mandarin can also be detected from their attitudes and behaviour in class during the teaching of Mathematics and Science (in Mandarin as opposed to English). As reported by the survey, only 38.1% of the students said that they are more likely to participate in Mathematics lessons in English. 35.7% reported being more likely to participate in during Science lessons in English. This finding is supplemented by evidence from the results of the Dong Jiao Zhong, the general discussion and newspaper articles. Out of all the schools surveyed by Dong Jiao Zhong, 82.3% observed that students could process knowledge better, are more attentive and participated more actively during Mathematics and Science lessons which are conducted in Mandarin, while it was the exact opposite in Mathematics and Science lessons conducted in English language. In an interview with Nanyang Siang Pau, some teachers commented that interactions between students and teachers are also much higher when Mandarin is used as medium of instruction (Nanyang Siang Pau, 4/2/2003, n.p). Conversely when English is used as a medium of instruction, the following, as complained by the exasperated senior teacher in our discussion, happens,

When English is used as the medium of instruction, the students are disinterested, as they don't understand. Thus they are more disruptive and often, I had to scold them. Thus sometimes, I use mixed code. Mandarin is used to explain what I had taught earlier (in English).

Hence, their difficulties in adjusting to the teaching of Mathematics and Science in English (as expressed by 65.2% of the schools surveyed in the Dong Jiao Zhong survey)

have been manifested in their academic performance in Mathematics and Science. As reported by the Dong Jiao Zhong survey, 59.9% of the schools expressed that students performed better in Mathematics and Science assessments in which the medium-of-instruction is Mandarin. However, as noted by 39.1% of the schools, due to the use of English language as medium of instruction for teaching Mathematics and Science, stress had increased, inadvertently affecting the learning of Mathematics and Science in Mandarin, with the consequence that students' mastery of Mathematics and Science had been negatively affected.

In fact, a 2006 study conducted by the Ministry of Education on the first batch of students (now Primary 4) educated under the 2002 Amendment to the Education Act, attest to the negative implications that the new education policy has on the academic performance of students from Chinese schools. The students were assessed on their Mathematics and Science performances (using the medium of English). According to an interview the newspaper conducted with the principals of Chinese schools in various states, the principals were reported to have said that most students did not comprehend the questions. Those that comprehended the questions did not know how to express themselves in English, resulting in a low 30-40% pass rate unlike internal school assessments conducted in Mandarin in which the pass rate for Science was above 60%. Likewise in this assessment, Chinese schools achieved 40-50% passes for Mathematics unlike internal assessments that pegged their performance at 70-80%. As evident, most students performed badly when the medium of instruction is English, especially in Science (Nanyang Siang Pau, 20/8/2006, n.p).

As commented by the article, Mathematics and Science used to be the strengths of Chinese schools, but with the medium of instruction changed to English, that circumstance had changed. In fact, the national pass rate for this assessment for Mathematics was 61% and 59% for Science, well above the Chinese schools (Nanyang Siang Pau, 29/12/2006, n.p). According to the article, using English as medium of instruction had led to a decrease in academic standards in Chinese schools, proving that mother tongue is the best medium of instruction. There have been suggestions that this lackluster performance could be due to the disproportionate amount of time spent teaching Mathematics and Science in Mandarin as opposed to English (Nanyang Siang Pau, 22/8/2006, n.p). Likely, this would reduce the attractiveness of Chinese schools and induce more parents to enroll their children in national schools, especially if the medium of instruction for Mathematics and Science in UPSR examination is restricted to English (a possibility after 2008). It is therefore, of no surprise that when questioned about their projected performance in Mathematics and Science in UPSR examination, three students (who had enrolled in schools after the implementation of the 2002 Amendment to the Education Act and would in all likelihood, have to write the assessments in English) attributed their projected bad performance in Mathematics for UPSR examination to their low competency in English as compared to seven who perceived that their mastery of English would affect their performance in Science negatively. Recognising the increasing importance that the Malaysian education system is placing on English, 66.7% of students attended private classes after school to cope with the teaching of Mathematics and Science in English.

The detrimental effects of the 2002 Amendment to the Education Act on students' learning and performance are clearly evident from the discussion above. Not only do students dislike the use of English as a medium of instruction, the use of English has also hindered their learning progress. Additionally, they also participated less frequently and performed poorly academically. Indeed, the situation does not bode well for the Chinese students if English becomes the only language medium used for Mathematics and Science in national examinations, unless changes are introduced after 2008.

4.4.2.3 Parent perspectives and attitudes

The third party in the trinity that the 2002 Amendment to the Education Act directly influence, is the parent. The changes introduced by the new educational policy and the challenges that ensued, can be a determining factor in the parents' views of their children's adjustability to teaching through English. This, in turn, could affect their support or lack of it for the new educational policy. As such, these factors could play a determining role in their decision to enroll their children in Chinese national-type schools as opposed to national schools, affecting the development and character of the Chinese national-type schools.

The survey of parents found that 23.8% of the parents thought that Mandarin is very important in Malaysia, as opposed to 16.7% who chose English. On the other hand, 48.1% of them preferred to send their children to Chinese national-type schools, the same percentage as those who would prefer to send their children to national schools. The parents appeared to acknowledge the linguistic capital of English, with 88.9% of the parents believing that being able to speak and write in English would offer more educational opportunities, better job opportunities (85.2%) and economic advancement

(51.9%). This contradictory position of wanting to retain their linguistic rights, yet acknowledging the instrumental value of English, is manifested in the Dong Jiao Zhong survey which found that 48.6% of the schools reported that the parents agreed with the need to raise English standards but disagree with the “2-4-3” scheme as it not only contravenes educational principles regarding mother tongue education, it also threatens the development of Chinese schools (as opposed to 1.8% of the schools which reported that their parents expressed approval for the policy). Evidence from the parent survey corroborated this finding. One of the parents commented,

Mathematics and Science are knowledge-based subjects. To inculcate knowledge, it is best to use a language that students understand easily so as to achieve maximum benefits.

Conversely, another parent questioned the rationale behind the Government’s decision to implement the 2002 Amendment to the Education Act. She doubted that use of English to teach Mathematics and Science could help in the development of Malaysia’s information communications technology. She cited Japan, Korea and Taiwan etc. as examples of countries that did not institute the teaching of Mathematics and Science in English, but are the leading countries in Asia in ICT. It is obvious that a huge proportion of the parents are opposed to the policy in its current form. According to the DJZ survey, 13.5% of the schools reported that their parents urged the Government to rescind the “2-4-3” scheme and reinstate the use of Mandarin as medium of instruction in the teaching and assessment of Mathematics and Science. As one parent puts it,

We should not let a mistake by the government affect the future generation. Children are the future of a country and a bad policy would necessitate many years and lots of effort to repair the damages. Thus, it is important to reconsider.

For all their opposition towards the policy however, the parents' ambivalent position is apparent from the increase in Mathematics and Science private classes, offered by tutorial agencies, that use English as a medium of instruction (Nanyang Siang Pau, 17/10/2002, n.p). According to research collected by Merdeka Centre, two in three parents have enrolled their children in private classes after school and the number of students who attend private classes after school spiked after the 2002 Amendment to the Education Act was implemented. Of those students who enrolled after the change in policy, 1/3 of them attended private Mathematics classes and 1/2 of them attended private Science classes (Nanyang Siang Pau, 24/12/2005, n.p). Torn between their beliefs in the benefits of mother tongue education as opposed to the increasing importance of English, nonetheless, parents take precautions in face of the increasing Anglicization of the Malaysian education system by equipping their children with support should English eventually become the only medium of instruction for Mathematics and Science in both teaching and assessments.

4.4.2.4 Summation of a community's responses

A review of newspaper articles collated, dating from the start of the policy, shows that out of a total of 899 articles related to the latest amendment to the education act, 513 of these detail the public's response to the policy. Of these 513 articles, about three quarters (73%) of the articles are negative responses. Of these 375 negative responses, 326 of them came from the Chinese community and its leaders. In fact, most of these articles (99) do approve of the Government's efforts in trying to raise the nation's standard of English, however, they do not approve of using English to teach Mathematics and Science to achieve that particular goal. Seventy of these articles call for the

Government to reinstate the use of mother tongue as the medium of instruction, a sentiment which resonates with the listeners of a local Chinese radio. A 24-hour survey was conducted by a local Chinese radio station- Ai FM (Airing without Barriers), to elicit Chinese viewers' opinions on the change in education policy. 976 listeners voted on the issue through sending in text messages. There are 80.8% listeners who approved of using only mother tongue for the teaching of Mathematics and Science, as opposed to the 5.3% who favoured the use of only English to teach Mathematics and Science. In addition, 13.4% of the listeners would rather the current situation remain, with the use of both English and mother tongue to teach Mathematics and Science (Nanyang Siang Pau, 26/10/2005, n.p)

The reasons for their desire to reinstate the use of mother tongue or Mandarin as the medium-of-instruction stem from their belief and educational evidence that mother tongue is the most direct and effective medium for educating children, especially those in primary schools. As such, the Chinese community (in 32 articles) argued that the policy is in contradiction to the findings of educational research and against educational principles. In fact, in 20 of the articles, questions about the potential harm to the children's learning and progress were raised. Questioning the logic behind the Government's spin that the use of English to teach Mathematics and Science would propel the Malaysian community to the forefront of the information communications technology race, there are 11 articles which cited examples of countries (such as Germany, Korea and Japan etc.) who are at the forefront of science and technology, and yet their mediums-of-instruction for Mathematics and Science or technology-related subjects, are in mother tongue. In addition, Mathematics and Science results in Chinese-

medium primary schools have always been superior compared to national and Tamil-medium schools. Many in the Chinese community feared that the policy would change the character of Chinese schools as more parents would send their children to national schools as Chinese school's advantages are gradually eroded. One of the most vociferous opponents of the policy, the Dong Jiao Zhong published a treatise, "The Last Defense" to inform the Chinese community about the 'disastrous' implications of the 2002 Amendment to the Education Act for Chinese schools and community (Nanyang Siang Pau, 4/8/2003, n.p).

4.5 Conclusion

In this chapter, I have presented the findings from the various approaches for my study. After presenting the various pieces of evidence from the different sources, I identified several themes that I believe to be related to the effects and implications of the 2002 Amendment to the Education Act on Chinese national-type primary schools. The new educational policy has brought about great challenges for many in the Chinese school community, especially in the areas of: completion of syllabus, repetition of lessons and marginalization of Mandarin and Chinese school's identity. However, support (be it effective or otherwise); in the areas of teacher training, teaching resources and mentor scheme; is introduced by the Government to help surmount these challenges. Often however, as described above, these supportive measures have been largely ineffective for the Chinese national-type schools due to its unique characteristics.

These changes, challenges and the subsequent support system implemented, have differing implications for the various stakeholders in the Chinese community. Their responses towards the 2002 Amendment to the Education Act have been affected by

these changes, challenges and support. Conversely, their perspectives and attitudes towards the policy could effect a change in the challenges and support the policy proffered, especially when the policy is due for a review in 2008.

In Chapter 5, I will revisit the main and sub questions with insights gleaned from the findings of my study presented above. I will conclude with recommendations for the improvement of the policy with regards to the Chinese community, and suggestions for future research in this area.

CHAPTER 5: CONCLUSION

In the previous chapter, the responses of the Chinese community – its educators, students and parents- offer an understanding of the 2002 Amendment to the Education Act for the Chinese minority, at both macro and micro levels. With a deeper understanding of the issues in mind, I now attempt to frame the findings within the various ideas and theories presented earlier in Chapter Two. In this chapter, I comment on how education policies (as reflected in the 2002 change in education policy) impact minority language, identity and rights (in this case, the ethnic Chinese minority group).

This concluding chapter is divided into five sections. In the first section, I will present a brief summary of the findings from the case study. Next, the research questions will be revisited, in light of the findings. A discussion of the recommendations will be carried out in the third section. The fourth section suggests possible areas for future research, as well as an overview of the limitations of the study. The chapter will then conclude with an epilogue on the relationship of the policy to the Chinese community.

5.1 Summary of the findings

In this section, I provide an overview of the findings obtained in Chapter 4. The findings acquired were in response to the sub-questions that derived from the two main research questions: What are the effects of the 2002 Amendment to the Education Act on Chinese schools, and What are the implications of 2002 Amendment to the Education Act for Chinese education?

In response to these two questions, findings from several sources-educators, parents, students, textbooks and newspaper articles- were obtained and cross-analysed. Several themes emerged from the findings. Firstly, the data indicate that the resultant

challenges of the 2002 amended act are unique to Chinese schools. Chinese schools, as a consequence of the new educational policy, have to cope with challenges in completing the Mathematics and Science syllabus, repetition of Mathematics and Science lessons and marginalization of Mandarin and Chinese schools' identity.

Secondly, to cope with the perceived changes that the change in education policy would bring for schools, the Ministry of Education instituted a slew of support mechanisms for schools. Three notable types of support emerged from the findings. Teacher training, provision of teaching resources and peer support (through mentoring scheme) are areas which the Ministry focused heavily on. However, it is apparent from the evidence that the Ministry adopted a 'one-size fits all' approach towards provision of support. The Chinese schools' unique characteristics and the differential forms (2-4-3 and 6-2-3-2 schemes) that the policy assumes (in the Chinese primary schools) are not taken into consideration.

Consequently, dramatic changes swept through Chinese schools like a bonfire and the ensuing host of challenges brought about a maelstrom of vehement responses from the Chinese community. Data obtained, point to three principal groups that are directly affected by the policy: educators, students and parents. For the Chinese educators, the change in policy has resulted in challenges that are unexpected and which they and their schools are not equipped to deal with. It also brought changes that could have far-reaching (and potentially disastrous) consequences for the existence and identity of Chinese schools and education, as well as for Chinese students' progress and academic performance. Thus, for the reasons cited above, most Chinese educators objected to the

implementation of the new policy in Chinese schools, though they did agree with the need to improve English standards in Malaysian schools.

The changes associated with the 2002 Amendment to the Education Act and the resultant challenges not only resulted in serious repercussions for Chinese schools, they also had an impact on student learning and perspectives. Findings indicated that the majority of the Chinese students had difficulties adjusting to English as the medium of instruction for Mathematics and Science, and performed inadequately when they are instructed or assessed through English, hindering their learning progress in the process. Conversely, Chinese students demonstrated a higher level of comfort and performance when taught in Mandarin. It is obvious that mother tongue education is preferred as it is the most effective and direct language medium for educating children, as opposed to the use of a second language as medium of instruction.

As for the Chinese parents, the majority felt ambivalent about the latest change in education policy. They objected to the use of English as the medium of instruction and advocated for a return to mother tongue education, rightly fearing a deterioration of their culture and linguistic rights. Yet, they could not deny the increasing importance of English in the global arena, an issue that they dealt with by providing their children with support outside of school. It is also an issue that the Chinese community is grappling with as a whole, and trying to resolve- that is, the best way to retain their heritage and linguistic rights, while keeping up with the pace of globalization and Anglicization.

5.2 Research questions revisited

In this section, the findings from Chapter 4 are discussed within the context of the relevant literature in a bid to answer the main and sub research questions that were investigated in this study. Under the first of the two main research questions, which examines the effects of the 2002 Amendment to the Education Act on Chinese national-type schools, explorations of two sub-questions: challenges that the implementation of the above stated policy would bring for Chinese schools, educators and students, and effects of the policy on Chinese students' learning and academic performance, are undertaken.

One of the research questions in the first chapter concerns the challenges that confront the Chinese schools, educators and students as a result of the amendment to the education act. From the current literature, political motivations play the primary role behind medium of instruction policies, especially in multi-ethnic societies (Deng & Gopinathan, 2006, p.614). One of the more common political agendas behind medium-of-instruction planning for a multi-ethnic community, is the assimilation or integration of the minority group into 'mainstream' society for purposes of ethnic management (p.621). The inability to complete the syllabus and the repetition of lessons can be construed as consequences of attempts by the Government to ensure that the Chinese students are being gradually assimilated through education. Initially, the plans for the new policy with respects to Chinese schools, only involved the removal of a few periods from the curriculum to teach Mathematics and Science terminology in English. However, this initial plan, to assure that Chinese students are not 'left behind' compared to their Malay and Indian counterparts, came to assume a political hue. The Chinese students are forced

to undergo the same teaching (as their national school brethren) through adherence to the same syllabus and usage of the same textbooks, though there are fewer periods allocated to the teaching of Mathematics and Science in English in Chinese schools compared to the national schools. In addition, they are already being taught the same syllabus and content in their mother tongue. In face of such handicaps in logistics and teaching (periods allocated, common syllabus and textbooks and repetition of lessons), teachers and students suffered immensely, in teaching and learning.

It is evident from the data collected, that it is difficult for many teachers to complete the syllabus given the lack of time and the volume of content to be taught. In addition, the training given to the Chinese teachers did not prepare them adequately for teaching Mathematics and Science in English (in the Chinese schools), culminating in an environment in which teaching is uninspired and possibly open to misinterpretations. It also contributed to challenges in completing the syllabus by virtue of the frequent removal of teachers from the classrooms and schools for training. Already suffering from the psychological burden of teaching in a foreign language medium, teachers also had to expend more time and energy on lesson preparation and teaching in English. Coupled with that, the Ministry's assessment of teachers' English proficiency is an unnecessary burden to the already beleaguered teachers. It is therefore not surprising that a sense of inadequacy and helplessness pervade the teaching of Mathematics and Science in Chinese schools. Standardization for purposes of assimilation has resulted in enormous challenges for teachers.

For students, the lack of time (due to the number of periods allocated) has resulted in unwarranted urgency in teaching, giving rise to a scenario in which completing the

syllabus outranks student' understanding of lessons. It is thereby not surprising that students' learning is affected, as there is insufficient time for students to process and learn what was taught. Another factor that affected students' learning, is the inadequate training offered to Chinese teachers, something that subsequently influenced the quality of teaching, posing further challenges for students. Besides the challenges with the completion of syllabus and quality of teaching, the repetition of lessons (albeit using a different language) only adds to the students' boredom as well as decreasing their motivation. As Cardenas and Carrasquillo have noted, mother tongue education provides students with a strengthened self-concept and the necessary motivation to learn (as cited in Chandler, 1992, p.83). Conversely, education through a foreign tongue diminishes the motivation to learn, as evidenced by the data. Not only is incomprehensibility an issue, initial adjustment difficulties (especially in terms of lower academic performance) also contribute to a lack of motivation to learn. Ultimately, the drive to integrate the Chinese students into mainstream society is in actual fact posing barriers to student learning, and attempting to marginalize them.

The various challenges discussed above are only a part of the hidden political agenda to integrate or assimilate the Chinese community through education. As indicated in the literature, the institution of a linguistic hierarchy is one of the initial steps towards the assimilation or integration of minorities (Lindgren, 2000, p.40). Another crucial integration or assimilation mechanism is the restriction of the domains in which the minority tongues are used (Baker, 2006, p.83). These two objectives are readily apparent in the 2002 Amendment to the Education Act. According to an analysis of the findings, the new educational policy has sought to position Malay and English as the two main

languages of Malaysian society, striving to push the positions of Mandarin and Tamil languages down to the second or third rungs on the hierarchical language ladder among the respective minority groups. As is evident from the data, out of the five subjects assessed in UPSR national examinations, only one is conducted solely in the medium of Mandarin. Furthermore, most of the 'less important' or 'conceptually less difficult' subjects (such as Music, Art, Health Education etc.) are taught through the medium of mother tongue, subtly signifying the low instrumental value of the mother tongue, and teaching minorities to despise their own languages (culture) when it is not given a position of prominence in education (Chandler, 1992, p.83). The above descriptions are trademarks of a transitional bilingual education, with the objective of language shift, which appears to be a high possibility under such circumstances.

Under the new policy, the use of Mandarin (or mother tongue) in Chinese schools to teach different subjects has steadily decreased. Additionally, Mandarin as a core subject has also seen its teaching time gradually decreasing. These new features are indicators of the carrot component of the 'stick and carrot' approach that Skutnabb-Kangas (2000) describes in her discussion of the experiences that ethnic minority groups undergo when they are pressured to assimilate or integrate. The institution strives to assimilate the Chinese minority group through persuasion (of the benefits of English for the general populace as well as for the Chinese community), ideas of traditionalism and uselessness in regards to the mother tongue (through the institution of a linguistic hierarchy in which Mandarin ranks below English and Malay) and positive reinforcement in relation to the dominant culture and language (through the provision of funding and resources for English teaching of Mathematics and Science) (p.130-1). There is thus

grounds for “illiteracy of oppression” (a direct consequence of the process of assimilation or integration at work) to occur, in which the minority ethnic group’s identity and means of resistance are often slowly destroyed (Van Deven, 2006, p.42). Furthermore, the new features introduced in Chinese national-type primary schools have resulted in the blurring of lines of distinction between the national and Chinese schools, a surefire strategy to erode the Chinese school’s identity. There is evidence that suggests that the identity and development of Chinese schools are already under siege. In future, Chinese schools would no longer be the bastion for defending Chinese education and the Chinese community’s heritage and culture.

The second sub-question concerns the effect of the 2002 Amendment to the Education Act on Chinese students’ learning and academic performance (if any). Cummin’s interdependence hypothesis appears to suggest that use of mother tongue as the medium of instruction can build on the less than fully developed linguistic and intellectual skills of the students on entry to school. Students will thereby, be able to benefit fully from interaction with the teacher, and enjoy access to the cognitive-linguistic operations necessary to assimilate the second language and develop concepts and knowledge taught through the second language. Following this presupposition, Chinese students’ cognitive development would surely be negatively affected if the medium of instruction is no longer the mother tongue, thereby posing obstacles to their learning and consequently, lowering academic performance. The data appear to corroborate the literature. The quality of learning and interaction appear to be negatively affected when English is used as medium of instruction as compared with when lessons are conducted in Mandarin. Difficulties in adjustment have also resulted in poor

academic performance of the Chinese students, when instruction is through the medium of English. Additionally, the stress from adjusting to English as the medium of instruction has also taken its toll on the learning of Mathematics and Science in Mandarin, for data obtained revealed that Chinese students' Mathematics and Science academic performance has suffered, even when the language of instruction is in Mandarin.

In regard to the main question on the effects of the policy change on Chinese schools, the findings clearly indicate that the amended education act has affected the Chinese community greatly, striking hard at one of the last bastions of Chinese identity and heritage. This new policy has chipped away at one of the 'sacred pillars' that upheld an agreed upon constitutional right of the minorities to their language and education in their mother tongue. Not only is the very essence of Chinese schools and education affected (through the use of English as medium-of-instruction) by the multitude of changes that accompanied the amendment to education policy, the proliferation of challenges arising from these challenges have culminated in an un-conducive environment for both teaching and learning.

The third sub-question concerns the response and perceptions of the various Chinese stakeholders towards the new education policy. As mentioned in the literature, concerns about preserving their particular identity from perceived external threats (such as assimilation or integration) often elicits in minority ethnic groups, a desire to maintain their languages and cultures (Chandler, 1992, p.21). Under such circumstances, "illiteracy of resistance" as proposed by Wagner could occur, in which the minority ethnic group, "wishing to safeguard its language and culture, and fearing assimilation,

turns in on itself and rejects the form of education imposed by the majority group” (as cited in Van Deven, 2006, p.41). As stated by Skutnabb-Kangas (2000), “a threat to an ethnic group’s language is therefore a threat to the cultural and linguistic survival of the group and thus, to its existence as a group, a people” (p.436). Thus the 2002 Amendment to the Education Act, with its attempts to replace Mandarin (the mother tongue) with English as the medium-of-instruction, has aroused vociferous responses from the Chinese community, who perceive it as the latest threat in a long series of attempts to assimilate or marginalize their community. As observed from the data, many Chinese educators felt the burden of teaching in a foreign tongue, with the accompanying increase in workload and inadequate support, not to mention stress. These unwarranted stressors, coupled with the challenges that the new educational policy has created for Chinese schools and their education systems, have led Chinese educators to believe that the policy is not planned with educational considerations in mind, and instead, is an instrument of assimilation or marginalization. This belief is particularly relevant as the data reveals that the policy would lead to the narrowing of differences between national and Chinese national-type schools, thereby diminishing Chinese schools’ uniqueness and attractiveness, and positioning the national schools as a comparable or attractive option for Chinese students. It is also indicated from the findings, that a small number of educators and members of the Chinese community appears to have ‘bought into’ the promises that the Malay-dominant Government has given regarding the benefits of the policy for the Chinese populace as well as the rest of the Malaysian community (the carrot approach as described by Skutnabb-Kangas, 2006). The division of the Chinese community into two camps of opinions and beliefs, had resulted in vehement opposition by the majority of the

Chinese educators towards the new educational policy, as they feared it would be potentially devastating to the continued development of Chinese schools and education, and would undermine the Chinese heritage. In addition, they feared negative implications for Chinese students. Thus, most Chinese educators are insistent on reinstating Mother Tongue as the medium of instruction in Mathematics and Science teaching and assessments, and call for Government to rescind the 2002 Amendment to the Education Act. They argued that the Government should not 'politicize' the issue, but rather should look at it from an educational standpoint.

Students' beliefs and responses play a big factor in parental support or lack thereof for the new educational policy. The data show that, instrumental value of a language ranks very high with parents. There is thus a possibility that parents would 'buy into' the 'English as a valuable economic commodity and resource' argument that the Government is basing its new education policy on. Consequently, Chinese parents may end up being 'consenting' partners in the gradual marginalization and assimilation of Chinese education and schools, through enrolling their children in national schools (where they perceive their children would be afforded equal or better access to the curriculum, and thereby better equipped to function in an increasingly Anglicised environment). On the other hand however, most parents are opposed to the use of English as the medium of instruction as they are justifiably worried about the negative implications of the policy for Chinese schools and education. As Skutnabb-Kangas (2000) has commented, if the minority ethnic group (in this case, the ethnic Chinese minority) perceives that their rights (linguistic and otherwise) have been infringed upon, and they have not receive fair treatment at the hands of the dominant Malay group, they are

generally resistant to change (p.125). In this case, Chinese parents could 'dig in their heels' and pressure the Government (using their not-so-inconsiderable political votes) to accede to their requests. The deliberations on the fate of the 2002 Amendment to the Education Act which is to take place after 2008, would probably help end the Chinese parents' ambivalent position. The parents' opinions and responses could swing either way on the pendulum after 2008.

To answer the second main research question regarding the implications of the change in education policy for Chinese education, data reveal that, in general, the perspectives and responses of the Chinese community have been unfavourable towards the new educational policy. Based on the earlier discussion on the changes and challenges that this new policy effected, there is cause for the Chinese community to believe that the character and integrity of Chinese schools and education have been compromised. In addition, they sensed a threat to the continued survival and development of Chinese education and schools. There also seems to be a consensus among the majority of the Chinese population that Chinese education would forever be changed by this one single act, which opens the floodgates to further assimilation attempts.

5.3 Recommendations

Following the discussion of the research questions in relation to the findings, the recommendations that follow are rooted in the data presented in Chapter 4. These recommendations can be categorized into two main categories: planning and implementation. Under planning, two recommendations, which propose to offer insights for future policy planning in regard to minority education, are outlined. The recommendations outlined are: dialogue and participatory planning; and research into

bilingual education models for minority communities. Recommendations under implementation address specific challenges or areas that are overlooked. The recommendations made are in the areas of allocation of class periods; textbooks; teacher training and resources; and medium of instruction.

5.3.1 Planning Recommendations

As stated in the earlier discussions, the decision to implement the new education policy was a hasty one, first announced on 11th May 2002 and implemented half a year later (Nanyang Siang Pau, 10/05/2002, n.p). The insufficient planning involved resulted in an unprepared audience and many unexpected challenges. Better planning would have helped prepare the population for the gradual implementation of the policy and eliminate or at least reduce, the problems that resulted from the hasty implementation. The following recommendations are suggested with the goal of improving educational planning in mind, especially with regard to a pluralistic community.

5.3.1.1 Dialogue and participatory planning

The 2002 Amendment to the Education Act is a top-down decision, one that was proposed by the then Prime Minister, Dr Mahathir (Gills, 2005, p.37). As evidenced from the data, little input was sought from the educators or the other stakeholders affected by the policy (the parents and students, etc.). In addition, the Malaysian government is adamant that the policy be extended to the Chinese community, and disregarded any contrary opinions expressed by the Chinese community. Any decisions made without participation from the 'ground level' or all stakeholders involved, would be sure to evoke feelings of irrelevance, and lack of ownership, resulting in minimal support for the policy. It would also convey the message that only the interests of the dominant group are served.

As such, when the minority groups perceive that their interests have been ignored, and that they did not receive fair treatment from the dominant groups, they are usually resistant to change (Skutnabb-Kangas, 2000, p.125). Additionally, planning made without consultation with all stakeholders, often results in oversights, which give rise to a host of unexpected problems, ultimately costing the institution, money, time and efforts expended etc.

Before enacting the new legislation, it would have been advisable to seek the opinions of those at the frontline- the teachers - and initiate dialogue with them, as well as with other educators. By so doing, valuable input could have been obtained and a sense of shared ownership (between the educators and the Ministry of Education) in regard to the policy would have been generated. With a sense of shared ownership, Chinese educators would be more committed to making the policy a success, rather than view it as another run-of-the-mill policy that would soon be replaced as the 'flavour of the month'. Nor would they perceive it as a tool of oppression, wielded by the dominant Malay group.

In addition, when there is participatory planning, the Chinese minority group could offer their input for the planning of the policy, thus ensuring that potential problems are minimized, and oversights addressed. It would also convey the message that the Chinese minority group is part of the Malaysian coalition and that its input is respected and sought. In so doing, the Chinese minority would not perceive the policy as a threat to their heritage and language. They would also view their interests as having been served, and look at their participation in the policy as a partnership with the dominant group. With commitment and support from the Chinese minority group, the

chances for success (at least within the Chinese schools) of the policy would have been vastly improved

5.3.1.2 Research into education models for minority communities

From the findings and discussion, it is obvious that planning for the 2002 Amendment to the Education Act did not partake of the available research regarding mother tongue education. Whereas current research advocates mother tongue education as the best medium for educating students, the Malaysian government has ‘backtracked’ in its treatment of mother tongue education. The Malaysian government staunchly believes that English (as the medium of instruction for Mathematics and Science) is the antidote to many of its problems, and the secret to economic and info-technological development and success. However, it is difficult to convince its populace to support its policy as it could not, and did not cite any international research that supports and gives credence to its switch to English as medium of instruction for Mathematics and Science. Neither did it conduct any local research that could assist or provide input for the planning of the policy, taking into consideration the contextual factors. Therefore, there are many kinks in the new policy, something that could be ironed out by research prior to planning.

As suggested by many Chinese educators, there are many successful education models that promote mother tongue as medium of instruction for Mathematics and Science. Japan, Korea, and Germany, for example, are countries that enjoy global economic and info-technological success despite having their respective mother tongues as medium-of-instruction. By studying such education models, perhaps insights could be

gleaned for improving education planning (especially pertaining to mother tongue education) for a pluralistic community such as Malaysia.

Alternatively, the Malaysian government could also examine bilingual education systems, such as enrichment bilingual education or even late-exit transitional education systems for features that they could incorporate into the new educational policy, so as to help improve the policy (in hopes of benefiting minority education). Besides examining different types of education systems, it is also recommended that a study be done of the European school model or the Luxemburg education model, in which different languages take turns being the language of instruction in less contextualized (such as Mathematics and Science) subjects and heavily contextualized subjects (such as Social Studies and History etc.) (Housen, 2002, p.401). In both of these models, students learn to operate competently in more than two languages. Additionally, these students not only achieve native-like proficiency for all three languages taught, their academic performance is also on par with international standards. However as acclaimed as these models are, it is not advisable to borrow uncritically from these models or transplant these models in its entirety to the Malaysian context for as Beardsmore states (1991), “No single model of bilingual education is universally applicable” (p.18). For bilingual education models to succeed, a supply of teachers with enough proficiency in the language of instruction plays a huge role too. Local research also plays in role in education planning for they can offer recommendations and insights, unique to the Malaysian context. Ignoring the local context can undermine the success of a policy. Research carried out locally, would help in offering suggestions for improvement and refinements to policy planning, as well as addressing areas of concern. Decisions and planning based on such research are often

much more sound and garner more support from the audience. Such measures would help ensure the success of a policy.

5.3.2 Implementation Recommendations

As seen in Chapter 4, there are many challenges that are a result of inadequate planning and implementation. The recommendations described below are specific to the challenges discussed earlier.

5.3.2.1 Allocation of class periods

I would recommend a shift in the emphasis of Mathematics and Science in English, in short, an overhaul of the “2-4-3” and “6-2-3-2” schemes, in response to the challenges dealing with completion of syllabus and repetition of lessons. Instead of having four periods of Mathematics and three periods of Science in English for Phase One, and two periods of Mathematics and two periods of Science in English for Phase Two of the implementation of the 2002 Amendment to the Education Act, it would be preferable for the Government to reconsider the initial proposal by the Chinese community for integrating English into the Chinese school’s curriculum. The initial proposal was for one to two periods of Mathematics and Science to be in English and that it was to be used only to introduce terminology in English. If Mathematics and Science in English periods are used to teach only terminology, there would be no repetition of lessons, as Mathematics and Science in Mandarin are used only for teaching concepts. In addition, if the syllabi of Mathematics and Science in English focus only on teaching English terminology, the periods allocated would be sufficient, instead of the current scheme in which teachers try to ‘cram’ the contents of what constitutes seven weekly Mathematics lessons into four (for Phase One) and two (for Phase Two) lessons. The

situation for Science in English is even more bleak, with what constitutes five periods of classes in national schools being squeezed into two periods in Phase Two in Chinese schools. Thus, instead of the 2-4-3 and 6-2-3-2 schemes for Phases 1 and 2, I propose a shift in not only the emphasis, but also a corresponding change in the periods allocated, through implementing a “4-1-1” and a “6-2-4-2” arrangement, a scheme that focuses more on the teaching of Mathematics and Science in Mandarin, with English as supplementary.

5.3.2.2 Textbooks

To solve the problems of syllabus completion and repetition of contents for lessons, the textbooks for the teaching of Mathematics and Science in English too have to be revamped. There are two suggestions to deal with this issue. First, they should compile a textbook, specially catering for the teaching of terminology in Mathematics or Science. A bilingual glossary could also be used in place of textbooks. Alternatively, a second suggestion would be to use the same textbooks for both Mathematics and Science in Mandarin and English, however, the textbooks would be bilingual, in that the English terminology for the concepts introduced could be directly beneath the Mandarin terminology. This would make it easier for students to acquire the technical language of both subjects in English. Both of the suggestions presented in this section ensure that contents are not repeated, and lessen the burden of syllabus completion.

5.3.2.3 Teacher training and resources

The training planned by the Ministry only targets the teaching of Mathematics and Science in English. It did not take into consideration the differences in contexts between the national and Chinese national-type schools, nor did it consider that the Chinese

teachers are teaching Mathematics and Science in English in fewer periods than those in national schools. Besides these two differences, there are other huge differences between the teaching of Mathematics and Science in the two types of education systems, such as teaching and learning styles etc. The training planned by the Ministry of Education is thereby not appropriate for teachers teaching Mathematics and Science in Chinese national-type schools, as evidenced by the findings that indicate a sense of inadequacy among the teachers in regard to teaching of Mathematics and Science in English. As the Chinese national-type schools face a different set of challenges from the national schools, the Ministry of Education should conduct a needs analysis of Chinese schools and tailor training for the Chinese teachers to help them cope with challenges unique to the teaching of Mathematics and Science in Chinese national-type schools. Teachers in Chinese national-type schools should also modify the teaching strategies they are introduced to (during training), instead of transplanting uncritically all that they were taught during training, into their classrooms in Chinese national-type schools.

Furthermore, the resources given to Chinese schools for the teaching of Mathematics and Science are meant only for English as medium of instruction. Therefore, these resources are not appropriate for the teaching of Mathematics and Science in English in Chinese national-type schools, as they have fewer periods for these two subjects compared to national schools. These inappropriate resources too play a factor, in problems pertaining to difficulties in completing the syllabus for they were not designed with the periods allocated to these two subjects in (Chinese national-type schools) in mind. It would therefore be advisable to study the needs of the Chinese national-type schools and design a set of resources that answer their needs.

5.3.2.4 Medium of instruction

Instead of having English as the medium of instruction for Mathematics and Science- two cognitively demanding subjects, it would be prudent to focus instead on the teaching of English as a core subject if the ultimate aim of the implementation of the policy is to improve English standards. There is no concrete proof (according to available research); as mentioned by some Chinese educators; that the use of English as medium of instruction for Mathematics and Science will or has resulted in an improvement in English standards. Thus, as many in the Chinese community suggested, an increase in the number of periods allocated to the teaching of English as a core subject and a focus on English pedagogy, might be more effective routes to improving English standards.

Incidentally, English can be used as the medium of instruction for 'less language intensive' subjects such as Music, Art, Physical Education and Health Education (instead of Mathematics and Science) so that the learning of English is less stressful as the above-mentioned subjects are not assessed. By so doing, the majority of the subjects assessed in UPSR national examinations would still be conducted through the medium of Mandarin, and Mandarin's position in the linguistic hierarchy among its community will be unchallenged and its instrumental value acknowledged.

The recommendations and suggestions laid out in this section, address only some of the more pertinent or urgent problems. They also deal with the challenges at the micro-level. As such, only the 'symptoms' are addressed. To truly address these problems at their fundamental levels, there has to be a corresponding shift at the macro-level of governance (especially in regard to its relationship with ethnic minority groups).

However, a discussion of the politics involved in the relationship between the Malay

dominant group and the minority Chinese group in Malaysia is beyond the scope of this study.

5.4 Limitations and possible directions for future research

There were some limitations to this study. Besides the methodological limitations described in Chapter Three, there are two main limitations to this study. One of the limitations concerns the time-sensitive nature of the study. This study explores the 2002 Amendment to the Education Act prior to 2008, however, the policy is due for a review after 2008. Thus, features of this education act could possibly be changed after 2008, thus rendering this study less relevant. However, the information gleaned from this study could still offer policymakers, insights into the Chinese community's experiences with and responses to the policy. Hence, these policymakers could be made aware of the challenges and/or deficiencies in the planning and implementation of this policy, so that they can better respond to the problems that this policy creates for the ethnic Chinese minority in Malaysia when planning for a revision after 2008. In short, these insights could assist in improving the planning and implementation process for the revision of 2002 Amendment to the Education Act, so that the policy can be a success not only for the dominant Malay community, but for the Chinese community as well.

Seeing that the 2002 amended education act is due for a review after 2008, an opportunity is available to extend the study beyond 2008. It would be interesting to explore the revision of the policy and its subsequent relationship with the Chinese community. Did the revised 2002 Amendment to the Education Act retain its previous form, and if it did not, what features have been revised? What is the basis for the revisions made? Did the revised policy take into account the Chinese community's

considerations? Did the revision of the educational policy further erode and marginalize Chinese education and heritage? What is the Chinese community's response to the revision? What is the role that politics (between the dominant group and the ethnic minority groups) play in the revision of this educational policy? These questions are only the tip of the iceberg. The questions that an in-depth study of the revisions to the 2002 Amendment to the Education Act can answer, are many and varied. This is an area that warrants an extended and detailed investigation.

A second limitation concerns the politically sensitive nature and timing of the study, as it was conducted at a time when elections beckoned. Thus, the study resulted in a smaller than desired sample for interviews, as well as an inability to gain access to policy documents and school documents. A larger number of interviewees could have offered deeper insights, and more valid observations. Incidentally, access to policy as well as school documents, would yield a more holistic understanding of the implementation as well as the planning of the 2002 Amendment to the Education Act. A further exploration of the topic, with a broader base of research interviewees, such as educators, as well as officials from the Ministry of Education, and members of the Dong Jiao Zhong, would definitely present a more complex and deeper picture of the issue.

As well as investigating the implications of the change in education policy for the Chinese minority group, it would be worthwhile to study the dominant Malay group and the Indian minority group with regard to the effect of the policy on their schools, and strive to understand the implications and effects on their respective communities, if one wishes to obtain a holistic and profound understanding of the policy in its totality. A

comparison between the implementation of the policy in the Chinese national-type and national schools could also follow from this investigation.

Another area that is worthy of further research is representations in the Mathematics and Science textbooks. Observations from the analysis of textbooks raise perturbing questions regarding cultural representations and gender equity issues. In terms of cultural representations, both the Science and Mathematics textbooks in English represent solely Malays. The Chinese are under-represented in these two textbooks, even when compared to the Indians. Likewise, a parallel situation can be detected in Science and Mathematics textbooks in Mandarin. There is very little (or none in the Science textbooks) non-Chinese presence in the textbooks. Interestingly enough, most of the illustrations in Mathematics in Mandarin textbooks depict Chinese families (consisting of a father, mother, a son and a daughter) engaged in family activities. This harks back to the Chinese cultural concept of the ideal Chinese family, which values familial ties greatly and consists ideally of a son and a daughter (the Chinese characters representing a son and a daughter, when combined yields the Chinese character for good). These observations give rise to many questions regarding the dynamics between the dominant Malay group and the ethnic Chinese minority. Questions that deal with marginalization of the minority groups and attempt to portray the majority groups as the dominant group (in all respects) in society come to mind. It is obvious from the representations in the textbooks that the Chinese are emphatic about preserving their culture and heritage through self-imposed insularity.

Besides cultural representations within the textbooks, gender equity is also another obvious issue. In the English Mathematics textbooks, there are fewer

representations of females as compared to males. Furthermore, the females are less progressive (for example, all Malay females are portrayed as wearing headscarves) and are often associated either with menial jobs or portrayed as engaged in domestic pursuits. Additionally, they are portrayed as being more submissive, less active than males, and of lower intelligence or less competent. In one example depicted in the English Mathematics textbook, the male is shown as achieving better results in Mathematics than the other three females (of different races). Additionally, in an example of a group of students who won a computer contest, the two female participants are portrayed as standing to the side of the computer screen, as compared to the three males who are seated directly in front of the computer screen and working on the computer programs. Males are portrayed as always engaged in active and outdoor pursuits, and are depicted as superior to females in both intelligence and physical abilities. These representations regarding gender are in line with Malay beliefs and culture in which the males are the head of the families and the main breadwinner. Women are confined to the domestic arena or even if they have jobs, these jobs are usually menial. It is apparent from these representations that women's status within the Malay community is low, an unsurprising development in a polygamous society.

It is interesting however, to note that the English Science textbooks had a more enlightened portrayal of females. In this textbook, the Malay females do not wear headscarves, and both sexes are depicted as being equally involved in different scientific activities. The characters portrayed are more progressive in both their appearances and activities engaged in. In terms of the Chinese textbooks, there is less of an issue with gender representations. Both sexes are equally represented and the activities both sexes

engage in are quite similar, with no delineation of domains. These observations regarding cultural and gender representations within the textbooks contributed to a great many questions regarding race, gender and politics. An investigation into the representations inherent in the textbooks proffers many exciting possibilities for a study of both race and gender in education.

A recent development in the Malay national schools also arouses many questions regarding the future development of Chinese education and schools. In 2003, the Government introduced Mandarin and Tamil as core subjects within the formal curriculum (Nanyang Siang Pau, 22/5/2002, n.p). Prior to this introduction, Mandarin and Tamil were not offered as part of the formal curriculum; only Malay and English are core language subjects taught in national schools. Technically speaking though, if more than 15 parents request for mother tongue (Mandarin or Tamil) to be taught in the Malay national schools that their children attend, their requests would be considered and provisions would be made for the teaching of these two subjects. However, these subjects are taught outside curriculum and after school hours. In reality, there are very few parents who made such requests. The 2002 Amendment to the Education Act and the introduction of Mandarin and Tamil into formal curriculum in national schools thereby could result in the diminishing of differences between the Chinese national-type schools and the Malay national schools, a threat echoed by many Chinese educators. Chinese national-type schools' appeal and strengths are hence being gradually eroded. Consequently, the Malay national schools are positioned as an attractive and viable option to Chinese national-type schools. By so doing, it appears that the establishment hopes to lure Chinese parents into enrolling their children in national schools. Is this

latest measure, another attempt to further the aims of assimilating Chinese national-type schools into the national education system? An investigation into this initiative (the introduction of Mandarin and Tamil as core subjects in formal curriculum in national schools) would definitely yield answers to the above question and contribute significantly to the existing literature on race management and education.

According to Nanyang Siang Pau, a yearly number of 7000 Chinese students from the state of Johore (the closest state to Singapore) pursued post-secondary education in Singapore. This number precludes Chinese students who pursued their primary and secondary education in Singapore, traveling to Singapore daily to attend school (23/8/2002, n.p). Personally, I have many relatives living in the state of Johore, and all of them pursued a primary education in Singapore, as did my two brothers who are Malaysians. This decision by Chinese parents (as well as my parents) to enroll their children in Singapore's primary schools despite the availability of local national and Chinese national-type education raises many questions. The main reasons given by most of my relatives and my parents, are that Singaporean schools provide an English medium education, as well as the opportunity to learn Mandarin (albeit as a second language). Many of my relatives (and I believe most of the Chinese parents) perceive that an English medium education would increase the competitiveness of their children in regard to obtaining jobs and a university education, and the opportunity to learn Mandarin would ensure that their children would retain Chinese values and heritage (taking into consideration that the dominant group in Singapore - numerically, politically and economically - are the Chinese). What then are the implications of the 2002 education policy for this trend? Is it reflective of the Chinese community's preference for English

medium education, a presupposition that was seized on by the then Prime Minister, Dr Mahathir, who perceives it as the Chinese community's silent acquiescence to his proposal (Nanyang Siang Pau, 23/8/2002, n.p)? As foreigners, Malaysian Chinese parents have to pay international student tuition fees for their children's education in Singapore's primary schools. How does this situation reflect on the equity issue among different ethnic groups? It appears that the Chinese parents, being economically more well-off, could afford 'better' alternatives to that offered by the national system. Many Chinese parents too send their children overseas to countries such as Australia, United States, Great Britain and Canada for their university education as opposed to the majority of the Malay students who pursue their university education in local universities. Consequently, two different groups of university graduates in Malaysian society have emerged, the overseas educated (who are mostly Chinese) and the locally educated (mostly Malays and Indians). In addition, these Chinese children are acculturated with a set of values and worldview different from their brethren who have undergone a Malaysian education. What then are the repercussions for the 'shared' national identity? Would the vastly different educational experiences (national, Chinese and Indian national-type and Singapore education) that Malaysian students go through serve to further marginalize and isolate the different ethnic communities? As such, the differential educational experiences of the Chinese community have played a huge role in the brain drain syndrome that is plaguing Malaysia. Many Chinese perceiving that they have been marginalized, both educationally and in other aspects, have continued to stay and look for jobs in the countries where they receive their university education, refusing to return to Malaysia. The questions raised have seldom been documented or researched, nor have

they been explicitly acknowledged by the Malaysian government. An exploration of this issue would add to the existing body of research on minority education and identity in Malaysia, as well as relationship of educational equity with economic and social equity.

5.5 Epilogue

Based on the findings from the study and the educational measures that the Ministry of Education instituted, it is most probable that the 2002 Amendment to the Education Act is here to stay, though the forms that it may assume may vary. Public pressures may result in some ‘cosmetic’ changes to the policy, but the very essence of the educational policy would remain unchanged. Rhetoric in the Government’s official documents leads me to believe that the Government has not given up, and has and will consistently pursue the goal of assimilation in regards to the Chinese ethnic minority. Therefore, Chinese education and schools will always face an onslaught of education policies, with the twin agendas of marginalization and assimilation. However, never before now has the threat to Chinese education and schools been so great or imminent. The 2002 Amendment to the Education Act has forever changed the character of Chinese schools, with its tsunami of changes. The position of Chinese education has become more precarious as time goes by. The 2002 Amendment to the Education Act will not be the only or the last assimilation tool that the Government of Malaysia will wield. It is the harbinger of a new era in Chinese education and schools, where struggles between the majority group and the ethnic minority Chinese group will intensify, as Malaysia becomes increasingly battered by both global and local pressures

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Appendix C

Student Questionnaire

There are no right and wrong answers to the questions in the questionnaire. Upon completion, please put the questionnaire in the envelope provided and seal it, before returning it to the school.

SECTION A: BACKGROUND INFORMATION

(Please tick the answer that reflect your background)

1. What is your gender?

a. male

b. female

2. What is your race?

a. Chinese

b. Malay

c. Indian

d. Others, please state:

3. How many languages or dialects do you speak, read or write?

a. Cantonese

b. Hokkein

b. Hakka

c. Teochew

d. English

e. Malay

f. Mandarin

g. Tamil

h. Others

4. What language do you use the most often?

- a. English
- b. Malay
- c. Mandarin
- d. Tamil

SECTION B: PARTICIPANTS' BELIEFS AND VIEWS

(Please tick the answer that most reflect your beliefs and views, unless otherwise stated).

1. What language do you want to learn the most? (Please rank in order of the most desired language with "1" being the language you want to learn the most and "4" being the language you want to learn the least).

- a. English _____
- b. Malay _____
- c. Tamil _____
- d. Others, _____ (please state, _____)

2. Why do you want to learn that language the most? (You may tick more than one box)

- a. It is popular
- b. It is useful
- c. It is an important language
- d. It is the national language
- e. It will help me get into a good school
- f. It will help me get a good job
- g. It is my mother tongue
- h. It will help me communicate with my community
- i. It will help me communicate better with other Malaysians
- j. It is useful in communication with the government and business
- k. It is important for communication with foreigners overseas

3. Do you like learning English?
- a. Yes
- b. No
4. Do you like learning Math and Science in English?
- a. Yes
- b. No
5. Do you want other subjects (e.g. music, history) to be taught in English?
- a. Yes
- b. No
6. What language do you feel most comfortable learning Mathematics and Science in?
(Please rank in order with "1" being the language you feel most comfortable in and
"4" being the language you feel the least comfortable in.)
- a. English _____
- b. Mandarin _____
- c. Malay _____
- d. Tamil _____

Section C: TEACHING PRACTICES

(Please tick the answer that best reflects your actions)

1. Are you likely to participate more often during Math lessons in English?
- a. Yes
- b. No
2. Are you likely to participate more often during Science lessons in English?
- a. Yes
- b. No

3. If you do not understand the English instruction, where would you get help from?

- a. Parents
- b. Friends and classmates
- c. Tutor
- d. School teacher
- e. Textbooks and assessment books
- f. Do not get help.

Section D: Student Performance

(Please tick the answer that best reflects your feeling)

1. What grade do you think you are going to obtain for Mathematics in the UPRS (Ujian Penilaian Rendah Sekolah)?

- a. Below 50.
- b. 50-59
- c. 60-69
- d. 70-79
- e. 80-89
- f. 90-100

2. What are your reasons for your answer to Question 1?

3. What grade do you think you are going to obtain for Science in the UPRS (Ujian Penilaian Rendah Sekolah)?

g. Below 50.

h. 50-59

i. 60-69

j. 70-79

k. 80-89

l. 90-100

4. What are your reasons for your answer to Question 3?

If you would like to share a more detailed account of your responses, please leave us your name and class (optional) for a follow-up study.

Name: _____

Class: _____

Thank you for your participation in this study

Appendix D
Questionnaire for Parents (draft)

There are no right and wrong answers to the questions in the questionnaire. Upon completion, please put the questionnaire in the envelope provided and seal it, before returning it to the school.

SECTION A: BACKGROUND INFORMATION

(Please tick the answer that reflect your background)

1. What is your gender?
 - a. male
 - b. female

2. What is your race?
 - a. Chinese
 - b. Malay
 - c. Tamil

3. What are the languages and dialects that you speak, read or write?
 - a. Cantonese
 - b. Hokkein
 - c. Hakka
 - d. Teochew
 - e. Mandarin
 - f. English
 - g. Malay
 - h. Tamil
 - i. Others,
please state, _____

4. What is your education level?

- a. Primary
- b. Secondary
- c. College
- d. University and above
- e. None of the above

5. What medium of instruction school did you attend?

- a. Mandarin
- b. Malay
- c. Others (please. state, _____)

Section B: PARTICIPANTS' BELIEFS AND PERSPECTIVES

(Please tick the answer that best reflects your beliefs and perspectives, unless otherwise stated).

1. Which language do you want your child to learn?

(Please rank in order, with "1" being the language you most desire your child to learn with "4" being the language you least desire your child to learn).

- a. English _____
- b. Malay _____
- c. Tamil _____
- d. Others _____ (please state, _____)

2. What language/s do you think are very important in Malaysia?

(Please rank in order , with "1" being the language you think is most important and "5" being the language you think is the least important).

- a. English _____
- b. Mandarin _____
- c. Malay _____
- d. Tamil _____

3. What schools do you prefer to enroll your child in?
- a. Chinese vernacular schools
 - b. Malay national schools
 - c. Others (please state, _____)
4. What do you think are the advantages of being able to speak and write in English?
(You may tick more than one answer)
- a. more educational opportunities
 - b. economic advancement
 - c. better job opportunities
 - d. higher social prestige
 - e. no advantages at all

SECTION C: PARENT SUPPORT & STUDENT PERFORMANCE

Please tick the answer that best reflects your actions and views.

1. Do you check your child's work and monitor his or her progress?

- a. Yes
- b. No

2. What types of support do you give your child?

- a. Go through his or her work with her
- b. Engage a private tutor for him or her
- c. Sent him or her to tuition classes
- d. Others
- e. None of the above

3. Does your child have difficulties adjusting to Math in English?

- a. Yes
- b. No

4. Does your child have difficulties adjusting to Science in English?

a. Yes

b. No

5. What does your child do when he or she encounters difficulties in learning Math and Science in English?

a. Seek help from friends and classmates

b. Seek help from parents

c. Seek help from teachers

d. Seek help from tuition teachers

e. Seek help from books

f. None of the above

SECTION D: TEACHING PRACTICES

1. How do you think the school can help in improving your child's academic performance in learning Math and Science in English?

If you have comments, suggestions or would like to share a more detailed account of your views regarding the 2002 Amendment to Education Act, please enter here:

Thank you for your participation

Appendix E

Discussion Questions for Principal

1. How long have you been a principal of this school? (BI)
2. What subject areas did you teach before you became a principal of this school? (BI)
3. In what medium of instruction schools were you educated? Elementary? Secondary? Tertiary? (BI)
4. Based on your teaching experience, what are the major problems in classroom teaching that may affect the implementation of English-medium instruction? (TP)
5. What is the major difference that you observe in your classroom supervision before and after the implementation of English medium instruction? (TP)
6. What is the difference in students' academic results before and after the implementation of English-medium instruction? (SP)
7. In the early stages of implementation, who plays the most important role in facilitating English as medium of instruction? (SST)
8. Can you tell me about some of the support given by the government to facilitate the implementation of English as medium of instruction policy? (SST)
9. Can you tell me about some of the training given to the teachers to equip them to cope with the change in the medium of instruction policy? (*keyword: in-service training*) (SST)
10. Do you think that there is a need for more training and support for the teachers? Why or why not? (SST)
11. Do you think there is a need for more support for the your school? Why or why not? (SST)
12. What are the changes that your school has to make to implement English as medium of instruction policy? (AEA)
13. Do you have any difficulties in implementing the policy? In which area? Why?(AEA)
14. In your opinion, what do you think is the rationale behind the 2002 Amendment to Education Act? (PBP)
15. What do you think are the implications of the new medium of instruction policy for Chinese vernacular schools? (PBP)

16. What do you think are the implications of the new medium of instruction policy on the Chinese identity, culture and language in Malaysia? (PBP)

Appendix F

Discussion Questions for Teachers (draft).

1. How long have you been teaching? (BI)
2. How long have you been a teacher in this school? (BI)
3. In what medium of instruction schools were you educated? Elementary? Secondary? Tertiary? (BI)
4. Where did you learn English? (BI)
5. How well do you feel you speak English? (SST)
6. Based on your teaching experience, what are the major problems in classroom teaching that may affect the implementation of English-medium instruction? (TP)
7. Before the implementation of English as medium of instruction policy, what were the major challenges involved in your classroom teaching (Maths and Science)? (TP)
8. After the implementation of English as medium of instruction policy, what do you find to be the major challenges involved in classroom teaching (Maths and Science)? (TP)
9. What are the changes, if any, that the English as medium of instruction policy has resulted in your teaching duties and practices? (TP)
10. From where or whom did you get training and support to cope with the change in the medium of instruction policy for the teaching of Maths and Science? (SST)
11. Can you tell me more about the training and support you received for teaching in English ? (SST)
12. Do you feel you need more training and support? (SST)
13. Do you feel confident in teaching Mathematics and Science in English? Why or why not? (SST)
14. How do you feel about the change in the medium of instruction policy? (PBP)
15. What are the changes that your school has made to implement English as medium of instruction policy? (AEA)
16. How did you know of the policy? (AEA)
17. What is your understanding of the policy? (AEA)
18. What do you think are the implications of the change in medium of instruction policy on the students' learning and academic achievement? (SP)

19. How do you think your students fare in Mathematics when taught in Mandarin as compared to being taught in English? (SP)
20. How do you think your students fare in Science when taught in Mandarin as compared to being taught in English? (SP)
21. What do you think are the implications of the new medium of instruction policy for Chinese vernacular schools? (PBP)
22. What do you think are the implications of the new medium of instruction policy on the Chinese identity, culture and language in Malaysia? (PBP)

Results of Parent Response Survey: 2002 Amendment to the Education Act and the Chinese national-type primary schools
Summer 2007

Parent Background		Participant's Beliefs and Perspectives			
Gender	Total respondents=27 Male= 9 (33.3%) Female=18(66.7%)	Languages parents want their child to learn	1.English, Tamil, Chinese, Malay = 5 (18.5%) 2.English, Malay, Chinese, Tamil= 4 (14.8%) 3.English, Chinese, Malay, Tamil =1 (3.7%) 4.Tamil, Malay, Chinese, English =4 (14.8%) 5.Tamil, English, Chinese, Malay=1 (3.7%) 6. Malay, Tamil, Chinese, English =6 (22.2%) 7. Invalid=6 (22.2%)	Parents checking and monitoring of child's work and progress	Yes = 25 (92.6%) No = (7.4%)
Race	Chinese =27 (100%)	Languages parents think are very important in Malaysia	1.Chinese,Malay,English,Tamil,Others=9 (33.3%) 2.Chinese,English,Malay,Others,Tamil =1(3.7%) 3.English,Malay,Chinese,Tamil,Others =3(11.1%) 4.English,Chinese,Malay,Tamil,Others =3(11.1%) 5.English,Chinese,Malay,Others*,Tamil =1(3.7%) 6.Malay,Chinese,English,Others*,Tamil =1(3.7%) 7.Malay,English,Chinese,Tamil,Others=2(7.4%) 8. Invalid=3(11.1%)	Types of support parents give their children**	Go through child's work with child=20 (74.1%) Engage a private tutor = 10(37%) Send child to tuition classes = 13 (48.1%) Others = 3 (11.1%) None of the above= 0
Language s & Dialects speak, read or write**	Cantonese=7(25.9%) Hokkein=15 (55.6%) Hakka= 7 (25.9%) Teochew =8 (29.6%) Mandarin=26(96.3%) English=17 (63%) Malay= 21(77.8%) Tamil=0 Others=0			Parents' belief that child have difficulties in adjusting to Mathematics in English	Yes = 15 (55.6%) No=12 (44.4%)
Educa- tion Level	Primary =1(3.7%) Secondary=6 (22.2%) College =14 (51.9%) University and above= 6 (22.2%) None of the above=0	Schools that parents prefer to enroll their children	Chinese national-type schools= 13(48.1%) Malay national schools = 13 (48.1%) Invalid = 1 (3.7%)	Parents' belief that child have difficulties in adjusting to Science in English	Yes = 17(63%) No = 10 (37%)
MOI schools attended.	Mandarin =9 (33.3%) Malay = 14 (51.9%) Others- English=1(3.7%) Invalid= 3	Advantages of being able to speak and write in	More educational opportunities= 24 (88.9%) Economic advancement = 14 (51.9%) Better job opportunities = 23 (85.2%) Higher social prestige = 10(37%) No advantages at all= 0	Areas where children seek help from when have difficulties in	Ffriends and classmates= 13(48.2%) Parents = 17 (63%) Teachers =18 (66.7%) Tuition teachers = 18

		English**		Mathematics and Science in English**	(66.7%) Books = 10 (37%)
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Note: * "Others" with asterisks denote dialects.

** Can make more than one choice

Results of Student Response Survey: 2002 Amendment to the Education Act and the Chinese national-type primary schools
Summer 2007

Background Information		Participant's Beliefs and Perspectives					
Gender	Total Respondents =42 Male=15 (35.7%) Female=27 (64.3%)	Languages want to learn the most	1.Mandarin,English, Malay,Tamil=14 3.3%) 2. Mandarin, Malay, English, Tamil=7(16.7%) 3. English, Malay, Mandarin, Tamil=3(7.1%) 4. English, Malay, Tamil, Mandarin=2 (4.8%) 5. English, Mandarin, Malay, Tamil=2(4.8%) 6. Tamil, Mandarin, Malay, English=1 (2.4%) 7. Tamil, English, Malay, Mandarin=1(2.4%) 8. Tamil, Malay, English, Mandarin=1(2.4%) 9.Malay, English, Mandarin, Tamil=1 (2.4%) 10. Invalid answers =10 (23.8%)	Participate more often during Mathematics lesson in English	Yes=16(38.1%) No=25(59.5%) Invalid=1(2.4%)	Grade expect to obtain for Mathematics in UPSR	1. Below 50 =3(7.1%) 2. 50-59 =5(11.9%) 3. 60-69 = 8(19%) 4. 70-79 =4(9.5%) 5. 80-89 =15 (35.7%) 6. 90-100= 6 (14.3%)
Race	Chinese =39 (92.7%) Indian =1 (2.4%) Others =1(2.4%) Invalid = 1 (2.4%)			Participate more often during Science lesson in English	Yes=15(35.7%) No=26(62%) Invalid=1(2.4%)		
Languages & dialects speak, read or write *	Cantonese=3 (7.1%) Hokkein=15 (35.7%) Hakka=2(4.8%) Teochew=4(9.5%) English= 26(6.2%) Malay=26(61.9%) Mandarin=41 (97.6%) Tamil=0 Others=1 (2.8%)	Reasons for choice cited above as language want to learn the most*	1.Popular = 4 (19%) 2.Useful = 18 (85.7%) 3. An important language=20 (95.2%) 4. National language = 3 (14.3%) 5. Get into a good school=8(38.1%) 6. Get a good job = 9 (42.9%) 7. Mother tongue = 20 (95.2%) 8. Communicate with my community = 14 (66.7%) 9. Communicate better with other Malaysians = 8(38.1%) 10. Communication with government and business = 4 (19%) 11. Communication with foreigners overseas= 10(47.6%)	Areas where help is sought from when do not understand English medium instruction*	Parents= 22(52.4%) Friends and classmates= 24(57.1%) Tutor=21(50%) School teacher= 23 (54.8%) Reference text=19(4.8%) No help =2(4.8%)	Grade expect to obtain for Science in UPSR	1. Below 50 = 2(4.8%) 2. 50-59 = 6(14.3%) 3. 60-69 = 6 (14.3%) 4. 70-79 = 9 (21.4%) 5. 80-89 = 16(38.1%) 6. 90-100 = 3 (7.1%)
	Language use most often	English = 4 (9.5%) Malay = 1 (2.4%) Mandarin = 34(81%) Tamil= 1 (2.4%) Invalid =2 (4.5%)	Like learning English	Yes = 32 (76.2%) No = 10 (23.8%)			

		Like learning Math & Science in English	Yes = 14 (33.3%) No = 28 (66.7%)				
		Want other subjects to be taught in English	Yes = 12 (28.6%) No = 29 (69%) Invalid= 1 (2.4%)				
		Languages feel most comfortable learning Math & Science in.	1. Mandarin,English, Malay, Tamil=24(57.1%) 2. Mandarin, Malay, English, Tamil=4(9.5%) 3. Mandarin, English, Tamil, Malay=1(2.3%) 4. Mandarin, Tamil, English, Malay=1(2.3%) 5. English, Malay, Mandarin, Tamil=3(7.1%) 6. English, Mandarin, Malay, Tamil=4(9.5%) 7. Invalid answers = 5(11.9%)				

Note: * denotes having one than one choice.

Content Analysis of Mathematics Textbooks Primary 5: English versus Mandarin

Unit Analysis	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5	
	CL	EL	CL	EL	CL	EL	CL	EL	CL	EL
Topics	Numbers to 1000 000	Numbers to 1000 000	Fractions	Fractions	Decimals	Decimals	Percentage	Percentage	Money	Money
No of pages	30	40	40	26	36	42	13	12	15	14
Concepts taught	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same
Skills taught	Different	Same	Same	Same	Same	Same	Same	Same	Same	Same
No of Examples	46	29	43	26	58	32	20	15	22	12
No of practice Questions	173 (29 PS)	131 (27 PS)	110 (17 PS)	96 (16 PS)	211 (27 PS)	121 (28 PS)	91	85 (5 PS)	74 (6 PS)	46 (9PS)
No of revision Questions	132 (23 PS)	32 (4 PS)	129 (24 PS)	35 (4 PS)	183 (17 PS)	31 (4 PS)	134	48	33 (1 PS)	28 (5 PS)
No of ICT resources	1 (Web)	3 (Cdrom) 5 (Web)	1 (Web)	4 (Cdrom) 7 (Web)	1 (Web)	3 (Cdrom) 6 (Web)	1 (Web)	4 (Cdrom) 3 (Web)	1 (Web)	4 (Cdrom) 1 (Web)
No of Illustrations	34	29	44	26	51	28	22	19	16	16
No of activity	0	0	0	5	0	1	0	1	0	1
No of Math puzzles	0	1	0	3	0	3	0	2	0	1
No of creative storytelling	0	1	0	3	0	3	0	2	0	1
No of Math projects	0	1	0	0	0	0	0	0	0	1

Content Analysis of Science Textbooks Primary 5: English versus Mandarin

Unit Analysis	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5		Unit 6		Unit 7	
	CL	EL	CL	EL	CL	EL	CL	EL	CL	EL	CL	EL	CL	EL
Topics	Micro organisms	Micro organisms	Survival of species	Survival of species	Food chain & web	Food chain & web	Energy	Energy	Electricity	Electricity	Light	Light	Heat	Heat
No of pages	11	13	14	10	12	10	17	12	14	11	11	11	11	9
Concepts taught	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same
Skills taught	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same
Terminology	12	9	16	14	8	9	18	15	8	19	8	10	10	5
No of practice Qn	2	5	9	5	8	5	13	5	9	5	6	5	5	5
No of Assigned work	4	2	0	0	2	1	1	1	2	2	4	2	1	3
No of ICT resources	3 web	4 Cd -rom, 1 web	1 web	4 Cd-rom, 1 web	2 web	1 Cd-rom, 3 web	4 web	3 Cd-rom, 2 web	2 web	3 Cd-rom 1 web	1 web	3 Cdrom	1 web	2 Cdrom
No of Illustrations	30	65	51	22	51	69	61	56	62	39	58	36	26	22
No of activities	2	2	2	4	1	3	1	1	1	1	1	1	1	0

No of experi- ments conduc ted	2	1	0	0	0	0	0	3	2	3	3	2	2	2
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Appendix K
Content Analysis of Nanyang Siang Pau news articles:2002 Amendment to the Education Act and the Chinese national-type primary schools
 May 2002 to April 2007

Theme	2002	2003	2004	2005	2006	2007	Total
2002 Amendment to Education Act- Reasons	35	3	0	4	1	0	43
2002 Amendment to Education Act- Implementation	23	13	1	5	0	0	42
2002 Amendment to Education Act-Problems	23	22	5	10	11	0	71
Support for Schools and Teachers	83	45	12	7	2	6	155
Response to 2002 Amendment to Education Act- Chinese community (Positive)	36	4	0	10	0	0	50
Response to 2002 Amendment to Education Act- Malay community (Positive)	69	5	2	4	3	0	83
Response to 2002 Amendment to Education Act- Indian community (Positive)	5	0	0	0	0	0	5
Response to 2002 Amendment to Education Act- Chinese community (Negative)	132	51	18	74	46	5	326
Response to 2002 Amendment to Education Act- Malay community (Negative)	30	1	1	5	7	0	44
Response to 2002 Amendment to Education Act- Indian community (Negative)	4	0	0	1	0	0	5
2002 Amendment to Education Act- Recommendations	47	1	0	5	5	2	60
Student Performance	0	5	0	2	4	0	11
Parental support for students	1	2	0	1	0	0	4

Appendix L
Dong Jiao Zhong School Survey: 2-4-3 Implications for Chinese national-type primary schools
 2006-2007

Themes & Sub-themes	Results
Pupils' progress in learning	
Adverse effects to the 2-4-3 scheme (with repetition of Mathematics and Science lessons in English and Mandarin) on students.	<p>60.3% of schools expressed that using two different languages to teach can cause the students to feel confusion and thereby affect the students' progress.</p> <p>40.4% of the schools noted that students feel bored and lose interest in learning.</p> <p>37.9% of the schools stated that having two different teachers teaching Math/Science in English language and Math/Science in Mandarin resulted in different teaching styles.</p> <p>24.8% of the schools expressed that learning the same contents twice would reinforce students' mastery of Math and Science.</p>
2-4-3's implications on students' stress level	<p>85.1% of the schools expressed that pupils' homework and assessments increased.</p> <p>76.6% of the schools expressed that due to their unfamiliarity with English language, pupils needed to invest twice or more the amount of time to prepare for Math and Science homework (in English).</p> <p>65.2% of the schools expressed that pupils have difficulties adjusting to the teaching of Math and Science in English, thus adding on to their stress.</p> <p>64.9% expressed that classtime has increased, adding to the students workload (Note: the "2-4-3" scheme has resulted in the weekly periods increasing from the original 46 to 50).</p> <p>3% of the schools reported that the 2-4-3 policy does not add on to the students' burden.</p>
Encountering problems related to learning of Mathematics and Science in English	<p>84.4% of the schools expressed that pupils could not attain mastery of the English language, and thereby affecting their learning of Maths and Science (in English).</p> <p>32.3% of the schools expressed that pupils' interest in learning Maths and Science in Mandarin /Mother Tongue had been indirectly affected.</p> <p>15.6% of the schools expressed that pupils had already comprehend the contents of the math/Science lesson during Mandarin instruction, therefore they do not meet with any problems during Math/Science lessons (in English language).</p> <p>1.8% of the schools expressed that pupils' mastery of English language is adequate to cope with the Math/Science lesson (in English).</p>

Appendix L (contd)
Dong Jiao Zhong School Survey: 2-4-3 Implications for Chinese national-type primary schools
 2006-2007

Themes & Sub-themes	Results
Pupils' Response	
<p>Difference in pupils' performance during the teaching of Math and Science in English language and Mandarin.</p>	<p>82.3% of the schools expressed that students could process knowledge better, are more attentive and participated more actively during Math/Science lessons that are conducted in Mandarin while it was the exact opposite in Math/Science lessons conducted in English language.</p> <p>59.9% of the schools reported that students performed better in math and Science assessments in which the medium is Mandarin.</p> <p>8.5% of the schools expressed that irregardless of the medium of instruction, pupils' capability in processing knowledge and performance in class do not differ much.</p> <p>6.0% of the schools expressed that irregardless of the medium of instruction, pupils' performance in the two different languages do not differ much.</p> <p>2.8% of the schools expressed that pupils performed better in Math and Science assessments in which medium of instruction is English language (Note. Schools which expressed this opinion stated that it was due to the fact that there are more non-Chinese pupils in these schools).</p> <p>2.8% of the schools reported that students could process knowledge better, are more attentive and participated more actively during Math/Science lessons which are conducted in English language while it was the exact opposite in Math/Science lessons conducted in Mandarin (Note. Schools which expressed this opinion stated that it was due to the fact that there are more non-Chinese pupils in these schools).</p>
<p>Improvement in students' mastery of Science and Math (with the implementation of the 2002 Amendment to Education Act)</p>	<p>51.1% of the schools noted that pupils are taught mainly in Mandarin, therefore their mastery of Math and Science have remained unchanged.</p> <p>39.0% of the schools expressed that due to the use of English language as MOI for teaching Math and Science, stress had increased, inadvertently affecting the learning of Math and Science in Mandarin, with the consequence that pupils' mastery of Math and Science had been negatively affected.</p> <p>26.2% of the schools reported that with the increase in periods (Math and Science periods in English language and Mandarin), pupils were able to learn more than previous, resulting in an improvement in pupils' mastery of Math and Science.</p>
<p>Improvement in students' mastery of English (with implementation of 2002 Amendment to Education Act)</p>	<p>69.5% of the schools expressed that pupils' vocabulary had increased, but there is no significant improvement in English language reading, listening, writing and speaking.</p> <p>39.0% of the schools noted that there is an improvement in pupils' mastery of English language skills in reading, listening, writing and speaking.</p> <p>27.0% of the schools noted that Math and Science are not language subjects, therefore they are unable to assist pupils in improving their mastery of English language skills.</p>

Appendix L (contd)
Dong Jiao Zhong School Survey: 2-4-3 Implications for Chinese national-type primary schools
2006-2007

Themes & Sub-themes	Results
Teachers' Response	
Adverse effects of 2-4-3 scheme on teachers	<p>72.7% of the schools expressed that teachers responsible for the teaching of Math and Science in English had to invest more time into lesson preparation and the use of English as MOI added to their psychological burden.</p> <p>71.3% of the schools noted that the teachers' workload was increased as there was an increase in the number of periods and the Ministry of Education did not send more teachers to cope with the extra workload.</p> <p>60.6% of the schools reported that as teachers who taught Math and Science in English were given an allowance, it has resulted in dissatisfaction among other teachers in schools, leading to internal conflicts.</p> <p>49.2% of the schools expressed that teachers who were assigned to teach Math and Science in English faced problems with operating ICT.</p> <p>44% of the schools noted that the policy of giving an allowance for Math and Science (in English) teachers had resulted in many teachers competing to teach Math and Science (in English), leading to difficulties for the principals when assigning teachers and consequently, dissatisfaction.</p>
Lack of teachers and 2-4-3 scheme	<p>56% of the schools expressed that they resorted to adding to teachers' teaching periods to solve the problem of extra periods that the "2-4-3" policy brought.</p> <p>37.9% of the schools reported that despite adding to the teachers' teaching periods, there was still no real solution to the lack of teachers as there were too many periods in the time table. They thus resorted to employing contract or supply teachers to fill the lack.</p>
Teaching Progress	
Effect of reduction in Math and Science periods (Mandarin as MOI) on teaching and students' learning	<p>81.6% of the schools expressed that due to the reduction in periods, the teachers' teaching time was insufficient. They had to rush through the syllabus, thereby affecting students' progress in learning Math and Science.</p> <p>17.7% of the schools noted that there was no problem with teachers' teaching and pupils' learning despite the reduction in periods.</p>
Effect on Chinese schools when number of periods using English as MOI under 2-4-3 scheme is far fewer than national schools, but both use same textbooks	<p>65.6% of the schools expressed that the schools tried to rush through the syllabus, resulting in pupils' having difficulties in processing the lesson.</p> <p>45.4% of the schools expressed that there were too few periods, therefore it is impossible to finish teaching the syllabus.</p> <p>23.8% of the schools noted that they needed to increase teaching periods or have extra lessons outside formal class time.</p> <p>18.1% of the schools noted that teaching of Math and Science lessons in Mandarin is the primary focus while teaching in English is supplementary, therefore insufficient teaching periods have no drastic effect on teaching and learning.</p> <p>14.9% of the schools reported that Math and Science lessons had already been taught through Mandarin, 4 periods of teaching the same contents using English language are sufficient.</p>

Appendix L (contd)
Dong Jiao Zhong School Survey: 2-4-3 Implications for Chinese national-type primary schools
 2006-2007

Themes & Sub-themes	Results
Threats to Chinese schools	
Implications on pupils' mastery of Chinese language with the implementation of "2-4-3" .	<p>72% of the schools expressed that the reduction in the periods had directly affected the students' learning, resulting in pupils' mastery of Mandarin decreasing.</p> <p>64.9% of the schools reported that students has to spend more time learning English, and conversely had less time to focus on mandarin, indirectly affecting their mastery of mandarin language.</p> <p>41.1% of the schools noted that students' stress had increased, resulting in a diminishing in interest in learning mandarin.</p> <p>5.7% of the schools reported that there has been no problem with pupils' mastery of the Mandarin language.</p>
Implications for Chinese schools if the implementation of the "2-4-3" policy continued.	<p>65.6% of the schools expressed that Chinese as MOI or Chinese language would be increasingly marginalized, and consequently, the pupils' competency in the Mandarin language would be decreased.</p> <p>61.7% of the schools noted that the character of Chinese schools would be changed.</p> <p>56% of the schools reported that Chinese students' mastery of Math and Science would be affected.</p> <p>52.5% of the schools expressed that the increasing belief in the paramount importance of English had led to diminished respect for the Chinese language.</p> <p>46.5% of the schools expressed that if the current situation continued, it would affect the transmission and maintenance of Chinese culture.</p> <p>1 school expressed that there would be no implication.</p>
Parents, Principals and Teachers' Perspective	
Parents' views in regard to the "2-4-3" policy.	<p>53.5% of the schools expressed that their parents had no opinions on the issue, they would go along with whatever the MOE or the principal decides.</p> <p>48.6% of the schools reported that their parents agreed with the need to raise English standards but disagree with the "2-4-3" policy as it not only contravenes educational principles, it also threatens the development of Chinese schools.</p> <p>23% of the Chinese schools noted that parents had urged the Government to rescind the "2-4-3" policy. Chinese schools had to use Mandarin as MOI in Math and Science teaching, and assessments.</p> <p>13.5% of the schools reported that their parents expressed approval for the policy as not only do students continue learning Math and Science in mandarin, they also learn the two subjects in English, thereby improving their English standards.</p> <p>1.8% of the schools reported that their parents expressed approval for the policy and believes that Chinese schools should follow in the steps of national and Tamil schools and use only English as MOI for Math and Science.</p>

Appendix L (contd)
**Dong Jiao Zhong School Survey: 2-4-3 Implications for Chinese national-type
primary schools**
2006-2007

Themes & Sub-themes	Results
<p>What are principals' and teachers' views regarding the "2-4-3" policy?</p>	<p>70.9% of the schools expressed agreement with the need to raise English standards but disagree with the "2-4-3" policy as it not only contravenes educational principles, it also threatens the development of Chinese schools.</p> <p>31.9% of the schools urged the Government to rescind the "2-4-3" policy. Chinese schools had to use Mandarin as MOI in Math and Science teaching, and assessments.</p> <p>18% of the schools expressed approval for the policy as not only do students continue learning Math and Science in mandarin, they also learn the two subjects in English, thereby improving their English standards.</p> <p>0.7% expressed approval for the policy and believes that Chinese schools should follow in the steps of national and Tamil schools and use only English as MOI for Math and Science.</p>

Appendix M

2-4-3 and 6-2-3-2 schemes as represented by the time-table in Chinese primary national-type schools

Subject	2-4-3 scheme (periods)						6-2-3-2 scheme (periods)					
	P1		P2		P3		P4		P5		P6	
	Prior 2003	Start 2003	Prior 2004	Start 2004	Prior 2005	Start 2005	Prior 2006	Start 2006	Prior 2007	Start 2007	Prior 2008	Start 2008
Malay	9	9	9	9	7	9	5	6	5	6	5	6
Manda- -rin	15	12	15	12	15	12	10	10	10	10	10	10
English	-	2	-	2	2	2	3	4	3	4	3	4
Math	7 (CL)	6 (CL)	7 (CL)	6 (CL)	7 (CL)	6 (CL)	7 (CL)	6 (CL)	7 (CL)	6 (CL)	7 (CL)	6 (CL)
		4 (EL)		4 (EL)		4 (EL)		2 (EL)		2 (EL)		2 (EL)
Science	-	3 (CL)	-	3 (CL)	-	3 (CL)	5 (CL)	3 (CL)	5 (CL)	3 (CL)	5 (CL)	3 (CL)
		3 (EL)		3 (EL)		3 (EL)		2 (EL)		2 (EL)		2 (EL)
Morals	5	4	5	4	5	4	3	2	3	2	3	2
Music	2	2	2	2	2	2	2	2	2	2	2	2
Physical Educa- -tion	1	1	1	1	1	1	1	1	1	1	1	1
Health Educa- -tion	2	1	2	1	2	1	1	1	1	1	1	1
Art	2	2	2	2	2	2	2	2	2	2	2	2
Life Skills	-	-	-	-	-	-	2	2	2	2	2	2
Civics	-	-	-	-	-	-	2	2	2	2	2	2
Social Studies	-	-	-	-	-	-	2	2	2	2	2	2
Princi- -pal's choice	1	-	1	-	1	-	-	-	-	-	-	-
Assem- -bly	1	1	1	1	1	1	1	1	1	1	1	1
Total	45	50	45	50	45	50	48	50	48	50	48	50

Key:

CL: Chinese language

EL: English language