Journal of Pan-Pacific Association of Applied Linguistics, 20(1), 135-155.

Fine-Tuning Medium-of-Instruction Policy in Hong Kong: Acquisition of Language and Content-Based Subject Knowledge

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Poon, A. Y. K., & Lau, C. M. Y. (2016). Fine-tuning medium-of-instruction policy in Hong Kong: Acquisition of language and content-based subject knowledge. *Journal of Pan-Pacific Association of Applied Linguistics, 20*(1), 135-155.

Facing a dramatic decline in English standards over the past decade, the Hong Kong Government introduced the 'Fine-tuning Medium of Instruction (MOI) policy' in 2010 to address the grievances arising from different sectors in the community. Integrating content and language has become popular in second/foreign language teaching in recent years. The main objective of the fine-tuning MOI policy is to raise students' English proficiency with a view to enhancing their competitiveness for further education and work in the era of globalization. Under this new policy, students can choose to learn through English upon meeting certain language criteria while schools are given more autonomy to offer English-medium classes. One aim of the present study is to explore the impact of the 'fine-tuning' policy on how language and content-based subject knowledge are acquired as well as strategies employed by teachers and students to facilitate their teaching and learning in the second language environment. A qualitative research method—semi-structured interviews of some teachers and students—is employed to collect data from two schools. The main finding is that while agreeing that their English proficiency could be enhanced through learning content-based subjects in English, students admitted encountering difficulties in the process.

Keywords: medium of instruction, language policy, content and language integrated learning, Hong Kong

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1 Introduction

Foreign language learning and content-based subject learning are conventionally viewed as different types of learning carried out in separate lessons within the curriculum. The former deals with the acquisition of language skills and knowledge about language whereas the latter focuses on knowledge of a specific discipline. Even though contextualization is emphasized in the current paradigm of English language teaching — i.e. Communicative Language Teaching and Task-Based Learning, the focus is still on language learning rather than on subject matter. In recent years there has been a call to integrate the teaching of language and content knowledge because of the spread of CLIL (Content and Language Integrated Learning), which started in Europe about two decades ago (Coyle, 2007; Dalton-Puffer, 2011; Lorenzo, Casal, & Moore, 2010), to the international arena in the past six years. Integrating content and language in teaching is, in fact, nothing new. The Canadian bilingual education immersion programmes, which share similar features, have had a longer history of research and practices (Cummins, 1976, 1983, 1885[1980]; Genessee, 1989; Lambert & Tucker, 1972) since the early 1970s. The Language Across the Curriculum Movement originated in Britain can even be dated back to 1966 (Fillion, 1979; Parker, 1985). Content-Based Instruction (CBI), a strong form of Communicative Language Teaching, also advocates integrating content and language in the context of learning English as a second/foreign language (Kaplan, 2002).

A project entitled "Investigating the fine-tuning medium-of-instruction policy in Hong Kong" was conducted by the authors during 2011-2012. This research hypothesised that the changing medium of instruction (MOI) policy would affect teaching and learning of content-based subjects, and a mix of quantitative and qualitative research methods was employed in the study. The present paper reports *only* on the qualitative study of the project, which investigates the impact of the fine-tuning medium-of-instruction policy on how language and content-based knowledge are acquired as well as strategies employed by teachers and students to facilitate their teaching and learning in the second language environment.

2 Background

Medium of instruction has long been a thorny issue in Hong Kong as a result of its historical, economic and political changes over the past five decades (for details, see Poon, 2010). Since 95% of the population is ethnic Chinese speaking Cantonese, a southern Chinese dialect, as their mother tongue, it is logical to presume that Chinese is used as the medium of instruction at school. However, owing to its historical background as a British colony, English was superimposed on education as well as on other domains like the judiciary and

government administration. Traditionally, Chinese has been used as the MOI in primary schools; the majority of secondary schools shifted to English medium instruction (EMI) to prepare their students for the keen competition to enter universities, which primarily adopt EMI. EMI secondary schools have become increasingly popular since the 1980s with the rapid economic development of Hong Kong, which is ranked the third largest international financial centre after New York and London according to the Global Financial Centres Index (Reuters, 15 March 2014). There was a dramatic decrease in the number of EMI schools from 300 plus to 100 plus because of the handover of sovereignty of Hong Kong to Mainland China by Britain in 1997 albeit the great demand for EMI schools in the community.

The changing MOI situations at schools were reflected in the public discourse over the last 50 years or so. Hong Kong saw three stages of debate on whether to use Chinese medium instruction (CMI) or EMI, from perceiving MOI as a historical and highly political issue during the 1960s – 1970s when anti-colonial feeling was high, to adopting a mellow view of MOI especially EMI as a product of economic development during the 1980s - 1997, and to the re-emergence of political-oriented antagonism between EMI and CMI after the handover (Poon, 2009). On the one hand, the advocates of CMI argued that learning through the mother tongue should be better for students' intellectual and educational development than through a second/foreign language; on the other hand, the supporters of EMI were of the view that Hong Kong needs an English-capable workforce and that English provides students with opportunities for advancement in higher education and career. The heated debate finally came to a close when the new fine-tuning MOI policy was in place in September 2010.

3 Fine-Tuning Medium-of-Instruction Policy

To date Hong Kong has seen four different MOI policies: the laissez-faire policy, the streaming policy, the compulsory Chinese MOI policy, and the fine-tuning MOI policy. Prior to September 1994, the Hong Kong government adopted a laissez-faire policy pertaining to MOI, so secondary schools were free to select their own medium of instruction. There used to be more CMI schools than EMI schools in the 1950s. However, the trend was gradually reversed with the introduction of 9-year free and compulsory education in 1978 and the expansion of secondary education, primarily because Hong Kong had been developed into an international centre of trade and commerce and the demand for English was on the rise. One shortfall of the laissez-faire MOI policy was that some schools claimed to be EMI schools but they, in effect, used mixed code (i.e. mixing Chinese terms in an English discourse) to teach content-based subjects as a result of students' inadequate English. A number of studies conducted in Hong Kong over the past four decades on the effect of EMI show that the lessons are generally

teacher-centred and the teaching style is traditional (e.g. Cheng, 1979; Evans, 2008; Yip, Tsang, & Cheung, 2003). The adverse situation continued until September 1994 when the streaming policy was in place with an aim to abolish mixed code teaching.

The streaming policy adopted a long-term and comprehensive framework to gradually categorise schools into three types (i.e. Chinese-medium schools, English-medium schools and two-medium schools) based on school choice and students' language ability. Unexpectedly, the Hong Kong government suddenly made a political decision to replace the streaming policy by the compulsory Chinese MOI policy in September 1998 because of the changeover of sovereignty (Poon, 2009). It was originally planned to turn all secondary schools into CMI schools. However, opposition voices in the community were so loud that the government finally gave in and granted exemptions to 114 schools to continue with EMI. The compulsory Chinese MOI policy was poorly received during its 12-year implementation from September 1998 to August 2010. The major criticisms were: declining English standards, decreased chance of entering university and labelling effect of categorizing schools into EMI and CMI schools (Poon, 2009). Malaysia experienced similar problems of changing the EMI policy to "all-Malay" MOI policy in 1969 on nationalistic grounds, and then switched back to EMI for mathematics and science subjects in January 2003 because of dipping English standards that block their competitiveness in the global arena (Gill, 2005). However, studies indicated that students had problems with learning mathematics and science through English, so the EMI policy was reversed once again in 2012 owing to massive protests of the stakeholders (Phan, Kho, & Chng, 2013).

Hong Kong saw another MOI policy change, and the fine-tuning MOI policy finally replaced the compulsory Chinese MOI policy in September 2010. The label of EMI schools and CMI schools has been lifted. Under this policy secondary schools are no longer categorized as EMI schools and CMI schools. There are, instead, EMI classes, partial-EMI classes (i.e. only two subjects are taught in English, or only some units of some subjects are taught in English) and CMI classes. Schools are free to offer EMI classes as long as they fulfil the following three conditions laid down by the Education Bureau:

(1) The school should be able to admit 85% students who are EMI-capable [as defined by the Education Bureau] for each EMI class;
(2) The teachers teaching EMI classes should have fulfilled a certain benchmark in English language;
(3) The school should be able to provide an English environment for students.

Enforcing the above conditions is paramount to successful implementation of the fine-tuning MOI policy because only those students whose second language (i.e. English in the context of Hong Kong) is up to

the threshold level are able to learn content-based subjects through EMI according to Cummins' Threshold Hypothesis (Cummins, 1976).

4 Research Methodology

4.1 Research questions

(1) How does the changing MOI affect teaching and learning in the classroom generally?
(2) What measures and strategies are employed by the teachers and students to facilitate teaching and learning of content-based subject knowledge through English?
(3) Will the fine-tuning MOI policy enhance students' English proficiency?

4.2 Research method

A qualitative research method—semi-structured interviews—was employed to collect data on the views of teachers and students in the sample schools on the fine-tuning MOI policy in its first year of implementation.

4.3 Sampling

Two government-aided secondary schools were invited to participate in the study. Both schools are Band 2 schools (Band 1 being the top schools and Band 3 being the bottom schools). The reason for choosing Band 2 schools is that Band 2 schools usually offer some EMI classes and some partial-EMI classes in the same form based on their student intake. By contrast, Band 1 schools are able to admit sufficient EMI-capable students so as to offer all EMI classes whereas Band 3 schools usually offer CMI classes as their students' English proficiency is not up to the standard.

Both schools have different backgrounds. School A is an old school having a long history of using EMI but was forced to change to CMI in 1998 under the compulsory Chinese MOI policy. School B is comparatively new and started as a CMI school in 2000. Both School A and School B offer two EMI classes and three partial-EMI classes in Secondary 1-3. For the EMI classes, four main academic content-based subjects (i.e. Mathematics, Science, Geography and History) are conducted in English; for the partial-EMI classes, there is a certain degree of English immersion because some units of selected content-based subjects are taught in English.

Six teachers from School A and five teachers from School B teaching Secondary 2 Mathematics, Science, Geography and History in both EMI classes and partial-EMI classes were interviewed individually. Each interview lasted for 30-40 minutes. Four Secondary 2 students from the EMI classes and partial-EMI classes of each school were selected based on their academic

and English ability to attend group interviews.

The interviews were conducted during March-April 2012—i.e. the second year of implementation of the fine-tuning MOI policy:

Interview questions for teachers:

(1) Do you observe any differences when the teaching medium changes from CMI to EMI?
(2) Do you think your students' learning and your teaching are affected because of EMI?
(3) How do you prepare for teaching content-based knowledge through English?
(4) What strategies do you use in EMI lessons?
(5) Do you agree that students' English proficiency can be enhanced when teaching and learning is conducted in English? Why?

Interview questions for students:

(1) What are the differences between learning through Chinese and English?
(2) Do you think your learning is affected because of EMI?
(3) How do you learn through English?
(4) What strategies do you use in EMI lessons?
(5) Do you think learning through English helps to improve your English?

5 Results and Findings

5.1 Teachers' views

All participating teachers admitted observing some differences when the teaching medium changed from CMI to EMI. First of all, the teaching schedule was affected especially in the first year of implementation because more time was needed to explain the concepts and English terms to students. A Science teacher pointed out that in every lesson some time had to be reserved for teaching English language, such as certain sentence structures and prepositions as used in Science. While echoing on the issue of time, a mathematics teacher noted that students were able to adjust to EMI after a period of time: "Students understand very quickly if we tell them some Mathematical concepts in Chinese, but it takes a longer time to explain the same concepts in English … It was hard for them at the beginning, but now they're more used to it as you could see from my S2 students just now" (BT1). Regarding the degree of adaptability, the teachers of more language-loaded subjects - Science, Geography and History - found it difficult to make

students understand some complicated concepts through English even though the students had gone through the initial stage of adjustment. Next, EMI had a psychological impact on students. All teachers interviewed agreed that students often had a sense of doubt and were not sure whether they had mastered the subject knowledge when learning through English, whereas formerly students could focus on the subject matter *only* when CMI was used, so it was more clear-cut. As a matter of fact, students were somewhat scared by EMI especially in the initial stage of implementation, so students in EMI classes tended to be quieter than those in CMI classes, as remarked by a Science teacher, "This group of students usually do not voice out their opinions. They are attentive but sometimes they remain silent although I try different ways to ask them questions" (BT3). A Mathematics teacher also noticed some difference concerning the progress of students, "If I compare the EMI class and partial-EMI class, the former may have a slower start, but after they're accustomed to the English medium, they're fine and catch up quickly" (AT1). On the whole, according to the teachers, students did not reject the use of EMI, and their attitude towards English was more positive than in the past when Chinese was used as the medium of instruction.

Students' learning was undoubtedly affected because of EMI. The main difficulty for students was to cope with both content-based subject knowledge and English at the same time. Sometimes the students did not know whether they had problems with the concept or the language, or both. One Mathematics teacher estimated that "maybe some students understand 20% less compared to others learning through CMI" (AT1). EMI, in effect, widened learner diversity in the classroom. According to the teachers, weaker students already had problems with understanding and analysing some concepts, EMI made their learning even slower. On the other hand, EMI also created a psychological barrier for the teachers because they were not native speakers of English and they needed to think beforehand, especially teachers of language-loaded subjects. The Science, Geography and History teachers admitted that they sometimes found it hard to express themselves fully when dealing with some difficult concepts in English. A Science teacher said, "Sometimes we can't teach very deeply, so we just handle the topic in a straight forward and simple manner" (BT4). A History teacher also confessed, "I've given up teaching certain concepts in an in-depth way that I used to do when teaching through CMI. For example, for 'electing the president', some students may ask what 'electing' means, I may use the word 'choose' instead" (BT6). Besides, in order to engage the class, teachers sometimes need to lighten the atmosphere, but it is not easy to do so in English as remarked by a Science teacher, "It's really hard to tell a joke in English" (BT3).

Since differences were observed when the teaching medium changed from CMI to EMI, all teachers admitted spending a lot of time on preparing for teaching content-based knowledge through English. Measures at different levels as shown in the following table were adopted:

Table 1. Measures Adopted to Facilitate Teaching Subject Knowledge through English

Curriculum	-	Collaborate with the English Panel so that students can apply certain linguistic features taught in English lessons to content-based subjects (Geography, History and Science)
	-	Reduce the number of topics as recommended by the Curriculum Development Council (Geography, History and Science)
	-	Design an additional bridging curriculum for EMI classes (Mathematics)
Teaching methods	-	Use scaffolding by breaking a teaching point into smaller parts (Science and Mathematics)
	-	Use contextualization to make concepts less abstract (Mathematics)
	-	Use the investigative approach (Science)
	-	Provide students with cases for applying the concepts (Geography)
Vocabulary	-	Compile a vocabulary list for students (Geography and History)
	-	Produce a vocabulary list in CD ROM with bilingual explanations (Science)
	-	Provide students with Mathematics-related vocabulary (Mathematics)
Readings	-	Select subject-related books for students' leisure reading, e.g. on logical questions (Mathematics)
	-	Prepare subject-related additional readings for students (Science)
Notes/ Worksheets	-	Make additional notes for students (Geography)
	-	Add more comprehension questions and hands-on exercises to the worksheets (Geography and History)
	-	Revise the notes and select topics with more applications to be conducted in English in class (Mathematics)
Video clips	-	Select more video clips to facilitate students' understanding (Geography)
Teaching aids	-	Select more interesting aids, e.g. pictures (Science and Mathematics), comic strips (Science)
Encouragement	-	Organise some competitions to arouse students' interest and boost their confidence in Mathematics (Mathematics)

In addition to spending extra time in planning and preparing their teaching at various levels as listed in Table 1, all the participating teachers applied a wide range of strategies in their EMI lessons in order to facilitate students' learning. Their strategies included both general/cognitive strategies as well as language-specific strategies as illustrated in Table 2 below:

Table 2. Teachers' Strategies Used in EMI Lessons

General/cognitive strategies	Language-specific strategies
- providing subject-specific vocabulary lists - using visual aids (pictures/videos/models/diagrams) - showing steps and procedures clearly & systematically - using Q and A (probing) - using examples - providing hints - using repetitions - providing notes - providing worksheets - providing a summary - designing activities - arranging group discussions - making use of group dynamics (e.g. putting students of different abilities in the same group)	- using simple English - teaching some phonics - asking students to read aloud some English terms - dictation of new terms - rephrasing - grammar - code-mixing - code-switching - using Chinese to explain difficult concepts

Most of the teachers interviewed preferred using Chinese as the medium of instruction or a mix of English and Chinese if given the choice. Mathematics, in particular, used a gradual approach in the transition period because using both English and Chinese at the same time could facilitate students' logical reasoning and problem-solving skills. On the other hand, though, they believed that EMI could enhance students' English proficiency, for the obvious reason that EMI created an English-rich environment in the classroom, which was conducive to English learning. According to them, content-based subjects provided students with lots of vocabulary and expressions that they normally could not find in their English language lessons. In addition, the new MOI policy had enhanced students' motivation for English language learning because "they have to face the reality that now they need to improve their English if they want to learn content-based subjects well through English", as remarked by a Science teacher (AT4).

5.2 Students' views

As the teaching medium is predominantly Chinese in primary schools in Hong Kong, secondary students who are placed in EMI and partial-EMI classes have the experience of learning content-based subjects through both Chinese and English. The participating students from School A and School B did not find any substantial difference between learning through CMI and EMI, except that the pace of learning was slower at the initial stage (i.e. when they were in Secondary 1). However, they gradually got used to it and did not

have many adjustment problems in Secondary 2. Almost all students claimed that they liked to learn content-based subjects through English although some said it was very difficult.

When the students were asked whether their learning was affected because of the change in MOI (for example, learning less subject knowledge), the students' answer was unanimous: "Not much", "a little bit", "not really". Some higher-ability students even said, "Using English seems easier … Yes, some terms are simpler and easier to remember in English than in Chinese, particularly in Maths and Science because these terms are actually translated from English into Chinese. For example, in Science, we have hydrochloric acid, and it is very hard to write in Chinese. In Maths, we can write abbreviations when stating reasons in English, but we have to write a lot in Chinese" (BS4). However, some lower-ability students admitted that they resisted using English at the beginning because they did not know how to express themselves in English and they were afraid of making errors in grammar, pronunciation and vocabulary, but the situation had improved after Secondary 1. Contrary to one's expectation, the students including lower-ability students preferred teachers' using English throughout all the lessons in one subject because they found the use of both English and Chinese in the same subject very confusing, as remarked by BS1, "I find it even worse. I need to remember two sets of words, both Chinese and English for the exams. That means I have more to memorise … it is very confusing to study half of the topics in Chinese and the other half in English." To all students, the biggest obstacle of learning through English was vocabulary as different content-based subjects had their special terms, which blocked students' understanding of some concepts.

Regarding the method they used to learn subject knowledge through English, most students admitted using their L1 — Chinese — to process knowledge—"I'd think about the Chinese translation of the words first and then try to understand what the teacher says" (AS3); "If I have to answer a question in English, I'll think about it in Chinese first, then find the words in English … organize the words … the tense …grammar and then say it in English" (AS2). There was a constant switching from English to Chinese, and then from Chinese to English.

Learning content-based subjects through English was actually difficult although the students claimed that there was not much difference between using CMI and EMI. They had to make additional efforts in learning through EMI: "I followed the procedures given by the teachers to learn through English. I discovered more during the process … the point is that we're willing to try" (BS3); "When I'm at home, I try to look up the words I don't understand in the dictionary" (AS4); "As my English is poor, I can't catch what the teacher says … I try to work harder, so I find a private tutor to help me" (BS1). Table 3 shows some general/cognitive strategies and language-specific strategies employed by the participating students:

Table 3: Students' Strategies Used in EMI Lessons

General/cognitive strategies	Language-specific strategies
Relying on teachers' design of lessons and worksheets	Using dictionary
Relying on teachers' explanation	Using L1
Using prior knowledge	Switching between L1 and L2
Identifying key words	Using simple words
Using examples	Watching English TV programmes
Using notes	Watching films
Asking teachers/ friends/private tutors	Reading subject-related materials on the Internet

Although extra efforts and strategies were called for, all participating students liked the idea of learning content-based subjects through English for a variety of reasons: "We can have more chances to expose ourselves to English" (BS1), "I can learn many new words and apply them to other subjects" (AS4), "we can learn more English and in future we'll use English at work" (AS3). The students unanimously agreed that EMI helped to improve their English proficiency as they had more opportunities to listen and speak in class and to read and write when doing assignments.

5.3 Findings

There are five findings drawing on the above data analysis:

1. Teachers and students had different opinions on using English as the medium of teaching and learning
2. Students encountered difficulties in learning content-based subject knowledge through English
3. Various measures were taken by teachers to enhance learning of content-based subjects
4. Different strategies were employed in the classroom by teachers of different subjects to help students to learn subject knowledge and language; likewise, students had also developed some strategies to help themselves to learn subject knowledge better.
5. Teachers and students both agreed that English could be improved when learning content-based subjects through English

6 Discussion

6.1 Impact of the changing medium of instruction on teaching and learning

Since the Chinese compulsory medium-of-instruction policy had been in place for a lengthy period of time (1998-2010), most teachers in secondary schools were used to the teaching medium of Chinese. Secondary students were, likewise, accustomed to Chinese medium instruction after studying in Chinese-medium primary schools for six years. The change in MOI from Chinese to English in Secondary 1 should obviously have a bearing on both teachers and students. Finding 1, however, reveals that the teachers and the students interviewed held different opinions on EMI. According to the teachers, EMI undoubtedly affects students' learning to a large extent in terms of their pace of learning and the quality of learning. Students using EMI generally learnt more slowly than those using CMI although their pace of learning might speed up after a period of adaptation. Because of language barrier, their learning usually remains at the surface level. By contrast, none of the participating students saw any negative impact of EMI on their learning. They did not think that they had learnt less subject knowledge because of EMI. Even though lower-ability students admitted that their pace of learning had been slowed down and they had struggled hard to get used to learning through English, they were of the view that the stage of adjustment was over after the first year of implementation. Why is there such a discrepancy in views between the teachers and the students? Both parties truthfully reflect their views based on their own experiences. As all the teachers have taught in the sample schools for at least several years, they have the experience in using both CMI and EMI. They are able to compare their own teaching using different MOI pertaining to the curriculum, teaching methods, teaching strategies and teaching effectiveness. They are also in the position to judge the performance of their students learning through different MOI. On the other hand, the students do not have any reference point concerning the differences in delivering the same curriculum through CMI in previous years and through EMI now. They do not know that their teachers have already reduced the number of topics and adopted a less in-depth approach in teaching some concepts. Neither are they aware that their teachers have made great efforts in applying a variety of strategies to help them through the period of adjustment.

The students in the sample schools are Band 2 students (Band 1 being top students and Band 3 being bottom students), and their academic ability and English competence are of average standards only. The greatest problem facing them is the challenge to cope with both content-based subject knowledge and English at the same time. Cummins (1976, 2000) posits in his Thresholds Theory that when bilingual children's L1 and L2 reach the higher

threshold level, they have positive cognitive advantages. The cognitive/academic dimension of language proficiency (CALP) can thus be transferred from one language to the other as L1 and L2 skills are interdependent according to the Common Underlying Proficiency Model of bilingualism (Cummins, 1981). On the other hand, if the bilingual competence of children is below the higher threshold level, there will be neutral or even negative cognitive effect. When this is applied to the educational context, the low level of L2 proficiency limits students' ability to cope with the curriculum if learning is done through L2. As less than half of the students in the sample schools are designated as English-capable by the Education Bureau, the English proficiency of a small percentage (about 15%) of the students in the two EMI classes in each school is below the upper threshold level, so their learning through EMI is inevitably affected. In fact, even though English-capable students are considered to possess upper-threshold-level English proficiency, there is a misconception about the Common Underlying Proficiency Model – i.e. to assume that knowledge and academic skills will be automatically "transferred directly across languages" (Cummins, 2000, p. 190). That explains why even students in the EMI classes experienced difficulties in learning content-based subjects through English, let alone those in the partial-EMI classes. This is corroborated by the descriptive statistics in the survey conducted prior to the interviews of the present qualitative study. 53% and 64% of the students admitted that they could only understand 50% of the content of the lessons and that they found it difficult to handle teachers' questions respectively (Poon, Lau, & Chu, 2013, p. 948). Students' learning is further hampered if teachers' English proficiency is not up to a very high level. Some teachers in the sample schools frankly admitted that they were not able to express themselves as equally fully and deeply in English as in Chinese although their English had presumably reached a certain benchmark. They had to simplify their teaching instead. Hence, the answer to the first research question is positive—i.e. the changing MOI from Chinese to English *does* affect teaching and learning in the classroom generally.

6.2 Measures and strategies employed to cope with learning subject knowledge through English

The second research question seeks to find out the measures and strategies employed by the teachers and students to facilitate teaching and learning of content-based subject knowledge through English. Finding 2 indicates that students *did* encounter difficulties in learning content-based subject knowledge through English despite their claim that there was not much difference between learning through EMI and CMI as opposed to their teachers' (Finding 1). The inferential statistics of the survey mentioned previously reports that the teachers and students' views on the need to use

strategies to teach content-based subjects through English are insignificant (t-value=-1.23, *p<.05). This affirms both teachers and students agreed that applying strategies in the EMI lessons was a must (Poon & Lau, 2011). To facilitate students' learning, various measures (see Table 1) are employed by content-based subject teachers in the sample schools (Finding 3). At the macro level, the curriculum is streamlined to cater for the needs of students, and collaboration between the English Panel and various content-based subject panels has been initiated (note: traditionally no collaboration between panels). At the micro level, specific teaching methods pertaining to content-based subjects are introduced, for instance, using scaffolding by breaking a teaching point into smaller parts, using contextualization to make concepts less abstract and providing students with cases to apply concepts, to strengthen students' cognition in order to master subject knowledge. Audio-visual aids, notes and worksheets are also used to facilitate students' understanding of subject knowledge. Developing students' cognitive ability alone is not sufficient if content subject knowledge is learnt through a second language. Cummins (2000) postulates that the Common Underlying Proficiency (i.e. language-cognitive abilities) must be well developed in order to cope with the curriculum processes of the classroom. The teachers interviewed might not have any knowledge of Cummins' bilingual theories, but in real practice they are aware of the importance of the role of English in their content-based lessons. That explains why an English component is built in their curriculum, for example, providing students with a vocabulary list and additional subject-related readings. It is legitimate to support students with the vocabulary list because a large amount of vocabulary is the greatest difficulty facing them in their lessons using EMI. Subject-related readings may not seem directly related to their learning of subject knowledge, but this is in line with Krashen's (2007) 'narrow reading strategies'. By 'narrow reading strategies' is meant continuous reading on a specific topic or author that gives learners a great deal of information, which finally helps to create the natural repetition of words and phrases to ensure comprehension. Therefore, the teachers particularly Science and Mathematics teachers see the need to assign additional subject-related readings for students, and they are, in effect, unconsciously applying 'narrow reading strategies' to their teaching.

Apart from the above measures, the teachers need to employ a variety of strategies including both general/cognitive strategies as well as language-specific strategies (Finding 4) (for the strategies, see Table 2) because learning subject knowledge in an L2 environment is not straightforward. The prerequisite for mastering content knowledge well is language proficiency, which is defined as "the ability to function in a situation that is defined by specific cognitive and linguistic demands, to a level of performance indicated by either objective criteria or normative standards …" (Bialystok, 2001, p. 18). The teachers interviewed are aware of the importance of enhancing students' English while teaching subject knowledge. Providing subject-

specific vocabulary lists is a common general strategy used by teachers of all subjects because the first hurdle facing students when learning through EMI is a large amount of subject-specific vocabulary, which is difficult and seldom used in English language lessons. In order to ensure students' acquisition of vocabulary, the teachers employ some language-specific strategies such as teaching some phonics, asking students to read aloud some English terms and having dictation of new terms. Such language-specific strategies, in fact, contribute to one aspect of cognitive processes involved in language proficiency—i.e. "control of attention" defined by Bialystok as "the level of attention and inhibition recruited during the cognitive processing" of language (Bialystok, 2001, p. 18). Attention is also required when ambiguity arises in understanding a concept delivered in L2. The other aspect of cognitive processes involves "analysis of representational structures", which refers to children's ability in making relations between learnt ideas/concepts (Bialystok, 2001, p. 18), e.g. writing definitions of scientific terms. Some cognitive strategies applied by the teachers (e.g. showing steps and procedures clearly and systematically, using probing, providing hints, and providing consolidation through notes and summary) help to develop students' ability in "analysis of representational structures". To facilitate bilingual learning (i.e. learning subject knowledge through L2), strengthening students' control of attention and analysis of representational structures is necessary but not sufficient. Metalinguistic is, according to Bialystok (2001), another aspect that needs developing in students. 'Meta' means extra and it refers to the process of manipulating or the use of language in different ways. 'Metalinguistic' refers to having extra linguistic knowledge, extra ability and extra awareness to be manipulated in tackling all the problems arising from learning content-based subject knowledge. Content-based subject teachers might be able to provide students with some linguistic input pertaining to their area of teaching through using some language-specific strategies as mentioned previously; however, they are not language experts and thus not able to give any metalinguistic support, which is crucial for bilingual learning.

Likewise, the students also need to apply general/cognitive strategies and language-specific strategies in their content-based lessons (Finding 4) (for the strategies, see Table 3). Learning requires mental work to understand subject-specific knowledge and to make sense of the knowledge in relation to the learner's prior knowledge and experience. Reasoning subject-specific matter is already cognitively demanding, and meaning-making through a second language is even more challenging as knowledge construction and language transfer from L1 to L2 take place simultaneously in the mind of the learner. According to Cummins (1976, 2000), language transfer involves not only linguistic skills but also cognitive skills, and is made possible, though not automatic, only when L1 and L2 reach the upper threshold level. Since not all students in the participating schools are English-capable students, they encounter difficulties in learning content-based subjects. Apart from relying

on teachers' support, they do make great efforts in learning content-based subjects through English. Using L1 and switching between L1 and L2 are the common language-specific strategies that they use. Activating their prior knowledge is also an effective cognitive strategy that students apply during their process of learning subject knowledge through English.

6.3 Code-mixing and code-switching

There is no consensus about the terms used to describe switches between languages in discourse (Baker, 2006; Myers-Scotton, 1997). Appel and Musken's (1987) definitions of code-mixing (i.e. switches at the lexical level within a sentence) and code-switching (i.e. switches over phrases or sentences across sentences) are the most appropriate ones to depict language use in the Hong Kong classroom. Poon (2013) identifies different patterns of using code-mixing and code-switching in content-based subjects taught in EMI and CMI schools. Most of the teachers interviewed especially Mathematics teachers explicitly admitted using the strategy of code-mixing and code-switching, which comply with some of the patterns identified by Poon (2013), for example, teaching mainly in English mixed with some Chinese words, and teaching in English first followed by explanation in Chinese. Despite diverse views pertaining to the use of code-mixing and code-switching, they are valuable strategies from the point of view of bilingualism and learning. For those students whose English is not yet up to but about to reach the upper threshold level (e.g. the students in the partial-EMI class), their CALP, through which subject knowledge is processed, is affected if they are required to learn content-based subjects through English. Even for the students in the EMI class whose English presumably reaches the upper threshold level, they also experience difficulty in learning subject knowledge through English at the initial stage because knowledge and academic skills cannot be automatically transferred across languages according to Cummins' Common Underlying Proficiency Model (2000). Teacher support is thus necessary. Using the strategy of code-mixing and code-switching "as a temporary means of enabling higher-order thinking process to be brought to bear on learning" (Lin, 2000, p. 183) helps to bridge the gap. However, the teachers should be alerted that if this temporary measure is made a permanent strategy in learning content-based subjects, it will be difficult for both the CALP of their L1 and L2 to reach the threshold level (Poon, 2013), and thus eventually affect students' bilingual development as well as cognitive development.

6.4 Enhancement of English proficiency

Under the fine-tuning MOI policy former CMI schools are given the flexibility to offer EMI classes and partial-EMI classes so that students have

the opportunities to use English as the medium of learning. Both teacher and student participants agreed that English could be improved when learning content-based subjects through English (Finding 5)—an answer to the third research question of whether the fine-tuning MOI policy will enhance students' English proficiency. Although most of the teachers are of the view that students learn faster and better through L1 and personally they prefer using CMI, they support the fine-tuning MOI policy because students stand a better chance of enhancing their English proficiency under this policy. Comparatively, the students are more positive about EMI albeit the difficulties encountered during the process of learning because they value the opportunities of learning more English now that the fine-tuning MOI policy is in place. All in all, the teachers and students have made a rational choice and realize that English as an International Language is a key to success in the era of globalization", as Li observes, "This self-awareness is deep in the psyche of Hong Kong Chinese, a psyche which transcends boundaries across generations and socio-economic classes" (Li, 2002, p. 51).

7 Conclusion and Recommendations

In sum, a qualitative study interviewing a sample of teachers and students in two schools in Hong Kong on the impact of the new fine-tuning medium of instruction policy has been reported. It is found that the fine-tuning MOI policy has great impact on teaching and learning in general and particularly on how language and content-based subject knowledge are acquired. The quality of teaching is affected in terms of breadth and depth because additional time is spent on helping students to break the barrier of using a second language as a medium of learning. Despite their positive attitudes towards EMI based on practical needs, the students are faced with lots of difficulties in learning subject knowledge through English. A wide range of measures and strategies including general/cognitive strategies and language-specific strategies are thus employed by both the teachers and students with a view to enhancing the quality of teaching and learning content-based subject knowledge in an L2 environment. An additional impact of the fine-tuning MOI policy on learning is English enhancement as students in the EMI classes and partial EMI classes acquire not only content-based subject knowledge but also English. Because of its flexible nature, the new MOI policy broadens rather than limits students' opportunities of receiving CLIL (Content and Language Integrated Learning).

The following are some recommendations on how to ameliorate the implementation of the fine-tuning MOI policy with a view to enhancing the acquisition of language and content-based subject knowledge:

1. Code-mixing and code-switching are useful strategies in helping students to make the transition from CMI to EMI in learning content

knowledge. They are, however, temporary strategies only and should not be made permanent.

2. With the support of both content-based subject teachers and English teachers, students should continue to strengthen their English in order to reach the upper threshold level so that their CALP can be transferred between L1 and L2, thus facilitating the cognitive processing of subject knowledge.
3. Since metalinguistic is crucial for bilingual learning but content-based subject teachers are not language experts, it is essential to have collaboration between content-based subject panels and English language subject panel. Therefore, Language Across the Curriculum (LAC) is worth promoting as a school policy.
4. Hong Kong has a long history of practising English-medium instruction without any awareness that EMI is, in essence, a model of CLIL. It is high time to make conscious efforts to promote CLIL, which requires close collaboration between content-based subject panels and English language subject panel, if the Hong Kong government wants to have effective implementation of the fine-tuning MOI policy.

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Fine-tuning Medium-of-instruction Policy in Hong Kong: Acquisition of Language and Content-based Subject Knowledge

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Received: April 6, 2016
Revised: June 19, 2016
Accepted: June 30, 2016