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Effects of immersion on young learners' proficiency in Hong Kong

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ABSTRACT

This quasi-experimental study was conducted in a Hong Kong primary school where the effects of an immersion programme on the English proficiency development of Grades 1–3 pupils were evaluated. Ninety-seven English-medium instruction (EMI) students and their 225 Chinese-medium instruction (CMI) peers completed pre-test and post-tests at the beginning and end of the academic year, respectively. Three administrators, six teachers, and one parent were interviewed regarding the programme's effectiveness. Inferential statistical analyses were conducted to compare the pre-test and post-test results of the EMI and CMI groups, while the thematic content analysis was conducted to analyse the interview data. The quantitative results indicate that both EMI and CMI students improved their L2 (English) proficiency. The qualitative findings imply that the EMI group achieved this without compromising their first language (Chinese) and content subject learning. Different stakeholders attributed the effectiveness of immersion to student characteristics, teacher support, rich L2 resources, and parental involvement. The findings of this study provide pedagogical suggestions on the implementation of EMI for young learners.

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Introduction

Bilingual education has been widely advocated because of its benefits in cultivating bilingual and biliterate students (García & Wei, 2015; Lu et al., 2025). Bilingual education programmes can be implemented in various forms depending on their educational and social goals, including immersion, English-medium instruction (EMI), content and language integrated learning (CLIL), and content-based instruction (CBI), among others (Thompson & McKinley, 2018). While CLIL and CBI emphasise both content knowledge instruction and developing second language (L2) learners' disciplinary and academic literacy, immersion and EMI are mainly content-oriented and the development of L2 proficiency may not be a major goal. In this study situated in the context of bilingual education in Hong Kong, immersion or immersion bilingual instruction (Hu, 2008) is discussed, which refers to students' receiving a significant amount of subject instruction via a language they are learning as a second language (Thompson & McKinley, 2018).

Although the effectiveness of bilingual education has been extensively investigated in the current literature, inconsistent findings concerning whether the dual goals of content-knowledge learning and L2 proficiency development can be achieved simultaneously have been obtained (Bialystok, 2018; Lo & Lin, 2019). While the majority of bilingual education studies focus on the contexts of secondary education (e.g., Wannagat, 2007), tertiary education (e.g. Aguilar & Muñoz, 2014), and heritage language education (e.g., Potowski, 2004), junior pupils (i.e., Grades 1–3 students) are relatively underexplored. This particularly holds true in Hong Kong (see Gilanyi et al., 2023 review article). The debate for and against bilingual education at junior secondary level became particularly vibrant after the replacement of 'mother-tongue education' by the fine-tuned medium of instruction policy in 2010, aimed at extending bilingual education to the majority of local junior secondary students (Chu, 2016). While the medium of

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instruction (Mol) of secondary education is addressed in the policy, whether English or Chinese should be used in elementary-level content subject teaching has been less discussed and Chinese (L1) medium instruction is dominant in Hong Kong primary schools (Lo & Lin, 2019). However, considering the cognitive and linguistic advantages of bilingual children reported in psycholinguistic research (e.g., Bialystok & Barac, 2012) and Hong Kong parents' preferences and stakeholders' demands for English-medium instruction (e.g., Choi, 2003), it is worth exploring the role of immersion in primary school education.

This study aims to evaluate the effects of an immersion programme in a Hong Kong primary school by 1) evaluating Grades 1–3 immersion and non-immersion students' development of English proficiency and 2) analysing the viewpoints of different stakeholders (e.g. administrators, teachers and parents). We hope that these findings will yield pedagogical and political suggestions on whether and how immersion can be implemented among young learners.

Literature review

Effects of bilingual education on L2 proficiency development

The effectiveness of bilingual education programmes in a second/foreign language (L2/FL) context on students' content knowledge learning and the development of their L1 and L2 literacy has been extensively explored. The core issues discussed are (1) whether and how learning content subject knowledge in L2/FL facilitates the development of L2 proficiency and (2) whether there is a compromise in content knowledge learning if the knowledge is taught in L2.

Existing studies on the impact of bilingual education have mainly been conducted in secondary and tertiary educational settings. For example, in Lo and Lo (2014) meta-analysis of 24 studies on the effectiveness of EMI in Hong Kong secondary schools, researchers found that Hong Kong ESL learners there were more proficient in L2 than their peers from Chinese-as-medium-of-instruction (CMI) schools. Moreover, EMI students adopted different learning strategies to overcome their learning difficulties and were more motivated and interested in learning. However, the advantage of L2 proficiency was achieved by compromising their L1 proficiency and content subject learning. Contrarily, Peng and Xie (2021) meta-analysis of 36 studies on the impact of EMI education in China's higher education setting revealed that Chinese EMI students who spoke English as a foreign language and majored in medicine performed significantly better than their CMI counterparts in both L2 proficiency and content subject learning. The findings of these two meta-analyses revealed the positive impact of bilingual education on secondary school and university students' L2 proficiency development but did not concur with the effects on content subject learning. This inconsistency raises questions about the contextual factors—such as subject area, instructional quality, or assessment methods—that may mediate these outcomes. The lack of consensus in the literature suggests that the relationship between bilingual education and content learning is more complex than previously assumed and warrants further investigation.

In addition to some contextual and social factors (e.g. the economic and social status of L2 and language policy) that may affect the effectiveness of bilingual education (Lasagabaster, 2001; Sah, 2022; Tedick & Cammarata, 2012), the age of students also matters. Young L2/FL learners, especially Grades 1–3 students who learn in a second/foreign/additional language, warrant attention for the following reasons. First, young learners are at different stages of cognitive development compared with adolescents and adults (Piaget, 1950). Cognitive and even affective differences between students of various ages may affect their learning. Hence, the above findings on the effectiveness of bilingual education or immersion programmes may not be generalisable to primary school classrooms. Second, in the L2/FL context, pupils may still be at an earlier stage of literacy development and obtain a relatively low level of L2/FL; therefore, they may encounter more difficulties than secondary school and university students. Despite the recognised importance of early bilingual education, there is a notable paucity of research focusing on young learners, particularly those in Grades 1–3. Most existing studies concentrate on older students, potentially overlooking critical periods of language and cognitive development. This gap is significant, as early educational experiences may have lasting effects on both language proficiency and academic achievement. One rare exception is Serra (2007). Using oral tests, the researcher traced the L2 developmental trajectory of German-speaking primary school students (Grades 1–6) who learned

mathematics in their L2 (Roman or Italian). Bilingual education facilitated L2 learning because students acquired more L2 vocabulary and decreased the frequency of replacing L2 missing words with L1 words. While Serra (2007) provides valuable insights into L2 vocabulary acquisition among primary students, the study's reliance on oral tests may not capture the full spectrum of language development, such as reading and writing skills. Furthermore, the absence of data on L1 maintenance and content mastery limits the generalisability of the findings. This methodological narrowness is a recurring issue in the literature, where studies often focus on a single aspect of proficiency or neglect long-term academic outcomes.

Stakeholders' viewpoints on bilingual education

Apart from testing the L2 proficiency of immersion students, researchers interviewed different stakeholders about their views on the effectiveness of bilingual education. O Ceallaigh et al. (2017) observed the implementation of CLIL in Grade-4 PE classes and interviewed five teacher participants and students in the Irish/Gaeilge L2 context. The teachers commented that with additional opportunities to use the target language in a meaningful context, the students became highly autonomous and motivated which consequently fostered their confidence and competence in language use. Their productive skills contributed to boosting their confidence in their L2 use. The PE teachers prioritised L2 learning over PE content learning in their classes and believed that they shouldered the responsibility of teaching L2 to students. Nonetheless, their focus was mainly on vocabulary learning whereas other skills were not given much attention.

Furthermore, in Pladevall-Ballester (2015) study on teachers', students' and parents' perceptions of bilingual education effectiveness, Grade-5 Spanish students were satisfied with the learning experience, valued the usefulness of learning a foreign language (i.e. English), and expressed their willingness to communicate in L2. Notwithstanding this positive aspect, low achievers were unsatisfied with bilingual education because the subject was too difficult and they lagged behind their peers. Their teachers also expressed concerns about low achievers and felt that they could not motivate or help them learn. The parents held an unrealistically high expectation of their children's L2 improvement after receiving bilingual education and hoped that such experiences would prepare their children for their professional future. They also acknowledged that their children had enhanced L2 levels and were more motivated to learn. However, some were worried that bilingual education might be detrimental to L1 acquisition and/or content learning.

Wang and Kirkpatrick (2015) surveyed and interviewed Grades 4–6 students and their parents in three Hong Kong primary schools on their perceptions of trilingual education (i.e. English, Cantonese, and Putonghua). Non-Chinese-speaking students at School A, a partial immersion school, expressed their willingness to learn an additional language, Cantonese, because speaking Cantonese involved them in the local community. Their parents also valued the immersion programme and were confident that their children would benefit from it and improve their L2 (English). Of the parents from all three schools, 87.7% insisted that some content subjects (e.g. computing, mathematics, and general studies) should be taught in English because if their children are proficient in English, they would have a greater chance of being admitted to key EMI secondary schools and adapt to EMI education. Bilingual education or immersion programmes seem to cater to parents' needs in Hong Kong.

While stakeholder perspectives provide valuable context, the literature tends to privilege the views of teachers and parents, with limited attention to administrators or policy-makers who play a crucial role in programme implementation. Furthermore, the student participants in these studies were mainly Grades 4–6 students, leaving the experiences and developmental trajectories of younger primary students (Grades 1–3) underexplored. Moreover, the positive attitudes among parents and students may reflect aspirational beliefs rather than actual outcomes, as highlighted by the mismatch between parental expectations and the experiences of low-achieving students (Pladevall-Ballester, 2015). This suggests a need for more nuanced, longitudinal research that examines not only perceptions but also measurable impacts over time. Overall, the literature underscores the context-dependent nature of bilingual education outcomes. The interplay between language policy, socioeconomic status, and school resources may mediate both linguistic and academic gains. Further research can therefore adopt a more holistic

approach, integrating both quantitative and qualitative data across diverse settings to develop a more comprehensive theoretical framework for understanding bilingual education's varied effects. Addressing these research gaps, the present study investigates the developmental trajectories of L2 learning among immersion and non-immersion students in a Hong Kong primary school, with particular attention to the often-overlooked younger age group (Grades 1–3).

Method

Research design and questions

This quasi-experimental study aimed to investigate Hong Kong primary school students' English proficiency development in a year-long immersion programme and their teachers', administrators', and parents' viewpoints on the programme. Two research questions were proposed:

1. Does the year-long immersion programme have a significant effect on the students' English Language proficiency development?
2. How do teachers, administrators and parent perceive the effectiveness of the programme?

Research context and participants

This study took place in a primary school in Hong Kong that launched its first English (L2) immersion class for Grade 1 in 2020. Situated in a predominantly Chinese (L1) area with low household incomes, the school faces strong demand for English-medium education, which may be associated with the perceived value of English in the community. Normally, such demand is catered for by fee-paying private or semi-private schools, while tuition-free government-aided schools like the target school use Chinese as their medium of instruction. The immersion class of the target school, therefore, represents a pioneering effort in primary-level immersion education within a largely monolingual, tuition-free setting in Hong Kong.

At the time of the study, the target school administered four immersion classes: two for Grade 1 ($n = 54$), one for Grade 2 ($n = 26$), and one for Grade 3 ($n = 24$), making up 26% of the total Grades 1–3 population ($n = 394$). The immersion (EMI) classes typically enroll students with stronger English skills than those in non-immersion (CMI) classes; parental support for L2 learning is also a key admission consideration. In these EMI classes, the majority of subjects are delivered in English, while Chinese and a few cultural subjects (e.g. Art and/Physical Education) are taught in Chinese. As such, these classes fit the general criterion of immersion education as a form of bilingual education where at least 50% of content-area instruction is conducted through the target language (Baker, 2011). Classroom MOI aside, students are encouraged to engage in English communication with both teachers and peers in break times, fostering a language-rich environment both inside and outside the classroom. This approach aims to enhance their overall English proficiency.

Given the purposes and quasi-experimental nature of this study, we recruited EMI students (Grade 1–3) as the experimental group and their CMI peers as the control group. Invitations were sent to all students and their parents and the majority (EMI students: 97; CMI students: 225) were willing to participate. Given the purposes and quasi-experimental nature of this study, the EMI students (Grade 1–3) formed the experimental group while their CMI peers, the control group. However, some dropped out in the middle of data collection because of personal reasons (e.g. sickness). Therefore, we collected pre-test data from 97 EMI students (female: 44, male: 53) and 225 CMI students (female: 100, male: 125) students aged between 6–8 years old. Eighty-three EMI and 206 CMI students completed the post-test. Table 1 shows the number of participants in each grade.

Table 1. Numbers of participants from each grade.

Grade	EMI	CMI
P1	53	69
P2	24	86
P3	20	70

In addition to EMI/CMI students, 10 stakeholders of the immersion programme, including three administrators, six teachers, and one parent, were interviewed during the implementation of the programme. Table 2 presents the demographic information of the stakeholders, who were all represented with pseudonyms. Except for Alex, who is a native-speaking English teacher, all other participants were native Cantonese speakers. All administrators and teachers were involved in the immersion programme for two to three years when the data were collected. The parent was invited because her daughter had studied in an immersion class at the target school for three years. She was also a music teacher at the school, although she had not taught in any immersion class.

Instruments

Pre-test and post-test in English language

The identical pre-test and post-test comprised three papers: listening (Paper 1, 20 minutes), reading and writing (Paper 2, 20 minutes), and speaking and vocabulary (Paper 3, 10 minutes). Paper 1, 2, and the speaking section of Paper 3 were adopted from sample papers at the A1 starter level of the Cambridge Young Learners Test, an established international test on English language for young learners (See Atay & Kurt, 2006). A pilot study was conducted to test and validate the papers and other instruments discussed in the following paragraphs.

The vocabulary part of Paper 3 was a test of students' knowledge of vocabulary. Vocabulary is commonly considered an important yardstick for evaluating and predicting language proficiency (See Vafae & Suzuki, 2020). A vocabulary list consisting of 20 randomly selected vocabulary items taught in mathematics and general studies—the two major content subjects in EMI classes—was shown to the student participants. The Vocabulary Knowledge Scale (VKS) (Wesche & Paribakht, 1996) was used to elicit students' self-reported knowledge and construct responses which showed their knowledge of content subject vocabulary items. The scale, as shown in Table 3, comprised six categories.

Interview protocol

The qualitative tool employed to gather information to complement the findings obtained using the aforementioned quantitative tool was a semi-structured interview with administrators, teachers, and parents conducted by the first author over Zoom. The interview was aimed at collecting stakeholders' perceptions of the effectiveness of the immersion programme. The stakeholders were asked about their feelings and expectations about the programme, difficulties when implementing the immersion class and remedial actions, their impressions of their students (or daughter) in the class (e.g. evaluations of students' English, Cantonese, and Putonghua proficiency, content subject academic outcomes, and personal development), and the facilitative/inhibitive factors in the programme.

Table 2. Demographic information of the interviewees.

Role	Pseudonym	Information
Administrator	Mr Gung (male)	Panel Head of mathematics
Administrator	Miss Lo (female)	Panel Head of the general studies
Administrator	Mr Lau (male)	Panel Head of English language and immersion programme leader; mathematics teacher; EMI teacher
Teacher	Miss Lai (female)	English language and general studies teacher; EMI teacher
Teacher	Miss Fong (female)	mathematics teacher; EMI teacher
Teacher	Miss Chan (female)	English, music, and general studies teacher; EMI teacher
Teacher	Miss Hui (female)	Chinese language teacher; Putonghua teacher
Teacher	Mr Fung (male)	Mathematics and general Studies teacher; EMI teacher
Teacher	Mr Smith (native-speaking English teacher, NET; male)	English language and general Studies teacher
Parent	Ms Leung (female)	Parent of the immersion programme student

Table 3. Word knowledge description.

Score	Description of the word knowledge
1	I do not know
2	Incorrect translation/meaning
3	Correct translation/meaning
4	Correct translation/meaning but the word is used in a semantically/grammatically inappropriate sentence
5	Correct translation/meaning and semantically appropriate, but in an ungrammatical sentence
6	Correct translation/meaning and semantically appropriate, and in a grammatical sentence

Data collection procedure

Before the study started, consent was obtained from all teachers, parents, and students involved. All student participants completed the English proficiency pre- and post-tests at the beginning and end of the academic year, respectively. While all EMI and CMI students completed Papers 1 and 2 in the classroom, 12 randomly-selected students from Grades 1–3 (36 in total) participated in the pre- and post-test of Paper 3 owing to labour intensity. Seven assessors, who were senior-year undergraduate students majoring in an English language teacher education programme at a local university, marked all three papers individually in the same venue. For Papers 1 and 2, in which all questions were closed-ended, standard marking guidelines were given. In Paper 3 which was an open-ended test, the same assessors underwent the process of moderation before administering the test to the student participants. A kappa index of 0.72 and 0.74 (95% CI for fixed-marginal kappa) was reached in the pre-test and post-test moderations, respectively, before the assessors were deployed.

Regarding the stakeholders' interviews, the administrators, teachers, and parents were interviewed using Zoom. It lasted approximately 15 minutes each and was conducted in either Cantonese or English, depending on the interviewee's preference. All interviews were audio-recorded. The interviewers' responses were analysed using a coding scheme, which is presented in the [Appendix](#).

Data analysis

Two sets of data, that is, results of the students' pre- and post-test in the English language and interview data of the various stakeholders, were collected by the end of the academic year. The seven assessors helped mark the test papers. Owing to the confidentiality policy of the target school, we were not allowed to obtain student information for the listening, reading, and writing tests. Hence, the pre-test and post-test scores were two independent groups of data and were not matched to each student. Given that the datasets were not normally distributed, we conducted Mann-Whitney U tests using SPSS version 26 to compare any differences among the groups. Holm-Bonferroni correction adjustment was applied in the analysis. For the speaking and vocabulary tests, we matched the pre-post-test scores to each student; therefore, to compare the changes in pairs, the Wilcoxon signed-rank test was used to test for any significant differences.

Regarding the interview data, a research assistant was recruited to transcribe the interviews verbatim. The transcripts were checked and analysed by the authors. The data were subjected to open and axial coding (Strauss & Corbin, 1998). A thematic content analysis was further conducted with the transcribed interviews and similar codes were integrated and converged into themes (i.e. different stakeholders' perceived the effectiveness of the immersion programmes and reasons underlying their perceptions: teacher support, parental involvement, learner characteristics, and learning resources). The authors checked all analyses and agreed on all codes and themes. These findings are presented in the following sections.

Findings

Quantitative data findings

Results of the pre- and post-tests

Mann-Whitney U tests were conducted to compare the pre-test and post-test listening scores of the EMI and CMI groups. The results suggested that the EMI students significantly improved their English listening skills from the pre-test ($n = 97$, $M = 9.35$, $SD = 3.93$) to the post-test ($n = 83$, $M = 12.64$, $SD = 2.36$),

$Z = -8.569$, $p < 0.001$, Cohen's $d = .54$. The CMI students also improved their listening skills from the pre-test ($n = 221$, $M = 5.12$, $SD = 3.92$) to the post-test ($n = 206$, $M = 8.67$, $SD = 3.93$), $Z = -7.287$, $p < 0.001$, $d = .41$. The pre-post test scores for Grade-1, Grade-2, and Grade-3 EMI and CMI students differed significantly. As shown in Table 4, significant improvements were observed at the end of the academic year for both the EMI and CMI students in all three grades.

Comparing the listening scores of the EMI with those of the CMI groups, the EMI students performed better in the pre-test and post-test than their CMI counterparts (pre-test: $Z = -7.953$, $p < 0.001$; post-test: $Z = -8.604$, $p < 0.001$). The same findings were obtained for students in each grade ($p < 0.001$).

Regarding the reading-and-writing test, both the EMI and CMI students improved from the pre-test (EMI: $n = 95$, $M = 13.71$, $SD = 7.21$; CMI: $n = 225$, $M = 7.28$, $SD = 5.90$) to the post-test (EMI: $n = 83$, $M = 18.78$, $SD = 5.09$; CMI: $n = 205$, $M = 10.92$, $SD = 6.12$), EMI: $Z = -4.889$, $p < 0.001$, $d = 0.37$; CMI: $Z = -6.197$, $p < 0.001$, $d = .30$. As shown in Table 5, significant improvements were found among all Grade 1 and 2 students; however, no significant differences were found between the pre-test and post-test scores for Grade-3 students.

Similar to the listening test results, EMI students also gained higher scores in both the reading-and-writing pre-test and post-test than their CMI counterparts: pre-test: $Z = -6.991$, $p < 0.001$, $d = 0.39$; post-test: $Z = -8.697$, $p < 0.001$, $d = .51$. This trend was also observed between the EMI and CMI groups in the Grade-1, Grade-2, and Grade-3 student population ($p < 0.001$).

Regarding the speaking test scores, the Wilcoxon signed-rank test results suggested no significant differences between the pre-test and post-test scores for both the EMI and CMI groups ($p > 0.05$). The Mann-Whitney U test results indicated that the EMI group (pre-test: $n = 12$, $M = 4.42$, $SD = 1.00$; post-test: $n = 12$, $M = 4.92$, $SD = 0.29$) outperformed the CMI group (pre-test: $n = 18$, $M = 2.78$, $SD = 1.52$; post-test: $n = 18$, $M = 2.83$, $SD = 1.58$) in the pre-test and post-test, respectively: $Z = -2.940$, $p < 0.01$, $d = 0.53$; $Z = -3.661$, $p < 0.001$, $d = .03$. Given the small sample size, the differences among students in each grade were not tested.

Regarding the vocabulary test, both groups showed significantly improved test scores at the end of the intervention. More specifically, the EMI group's average score increased from 25.92 ($n = 12$, $SD = 5.98$) in the pre-test to 52.67 ($n = 12$, $SD = 22.67$) in the post-test, $Z = -2.937$, $p < 0.01$, $d = .84$. Additionally, the CMI group's average score increased from 20.94 ($n = 18$, $SD = 2.26$) in the pre-test to 28.00 ($n = 18$, $SD = 11.97$) in the post-test, $Z = -3.015$, $p < .01$, $d = .51$. However, given that the EMI students significantly outperformed their CMI counterparts in both the pre- and post-tests ($p < 0.01$), it is difficult to conclude that the EMI intervention influenced learners' vocabulary learning.

In summary, both the EMI and CMI groups improved their listening, reading, and writing skills and vocabulary knowledge at the end of the academic year, but their speaking proficiency changed insignificantly.

Qualitative data findings

Findings of the interview

The findings of interviewed conducted with three administrators, six teachers, and one parent are reported as below.

Table 4. Listening test scores.

	EMI			CMI		
	Pre-test	Post-test		Pre-test	Post-test	
Grade-1	6.89 (3.75)	11.76 (2.92)	$Z = -5.956$ $p < 0.001$	1.72 (2.35)	7.15 (3.85)	$Z = -7.920$ $p < 0.001$
Grade-2	12.21 (1.10)	13.57 (0.99)	$Z = -4.351$ $p < 0.001$	5.77 (3.24)	8.66 (3.86)	$Z = -4.609$ $p < 0.001$
Grade-3	12.45 (0.94)	13.50 (1.04)	$Z = -3.390$ $p = 0.001$	7.59 (3.65)	10.21 (3.53)	$Z = -4.416$ $p < 0.001$

Note. Standard deviations are inserted in brackets.

Table 5. Reading-and-writing test scores.

	EMI			CMI		
	Pre-test	Post-test		Pre-test	Post-test	
Grade-1	8.71 (5.79)	16.24 (5.76)	$Z = -5.270$ $p < 0.001$ $d = 0.55$	2.30 (2.68)	9.07 (5.00)	$Z = -8.126$ $p < 0.001$ $d = 0.70$
Grade-2	18.38 (3.45)	20.96 (2.42)	$Z = -2.859$ $p = 0.004$ $d = 0.42$	8.17 (5.01)	10.91 (6.00)	$Z = -2.973$ $p = 0.003$ $d = 0.23$
Grade-3	20.85 (2.50)	21.94 (2.13)	$Z = -1.514$ $p = 0.130$ $d = 0.25$	11.09 (5.87)	12.90 (6.79)	$Z = -1.489$ $p = 0.136$ $d = 0.13$

Note. Standard deviations are inserted in brackets.

Perceptions of the administrators. Mr. Gung, Mr. Lo, and Mr. Lau were the panel heads of the target school. Mr Lau, the immersion programme leader and Panel Head of English language, considered the programme to follow the concept of ‘catering to diversified learner needs’ because on the one hand, this programme accepts non-Chinese speaking (NCS) students who may not adapt to CMI environments in most local schools. On the other hand, some bilingual Hong Kong students excel better in English than in Chinese and therefore, this programme ‘offers them opportunities to learn in the language they are better proficient in’. Lau also commented, ‘the programme prepares students for admission to EMI secondary schools’, which are regarded as Band-1 (or the most prestigious) schools in Hong Kong.

Echoing the students’ test results, all three administrators observed students’ improvements in English language proficiency, especially in terms of vocabulary learning. Such kind of improvements in language performance were achieved without compromising content knowledge learning because Mr Gung, the mathematics Panel Head, acknowledged that ‘EMI students also gained higher scores in content subjects than CMI students did. There were also more high achievers in the EMI than in the CMI group in the mathematics exams. For example, for P3 students, 50% of the EMI students were high achievers, but only 31% of the CMI students were categorised as high achievers’.

The administrators attributed the improvements in EMI students’ English proficiency to three main reasons. First, they emphasised teachers’ endeavours to explore effective methods of teaching English terminology to their students in content subject classes. Mr. Gung and Miss Lo (the Panel Head of general studies) mentioned that, compared with CMI, EMI requires students to acquire more subject-related terminology. Therefore, content subject teachers must determine effective methods of teaching English vocabulary in EMI classes. Miss Lo commented,

More time is required for lesson planning, as teachers need to explore various kinds of supplementary teaching materials. Some abstract and less-frequent terms, such as plants and terms in Basic Law, may even be novel to the teachers. Hence, they should be well-prepared. Our teachers collaboratively planned their classes and spent time exploring appropriate teaching approaches, methods and techniques.

Miss Lo’s perceptions were also shared by Mr. Gung, who reinforced that in mathematics, EMI students should memorise a long list of vocabulary items; therefore, effective teaching of English vocabulary played a crucial role in their content subject learning.

Grades 1–3 is a key stage one and Grade 4–6 is a key stage two. In addition to offering students Chinese-English bilingual word lists, I demand that mathematics teachers to teach maths terms and prepare students for maths learning at key stage two. Some important terms, such as no remainder and divisible, should be reinforced because they will be mentioned from time to time at key stage two and even in secondary school education.

Mr. Gung also believed that L1 (Chinese) should be adopted when terms are extremely abstract and higher problem-solving skills are needed.

The second reason is the higher initial English proficiency level and academic performance of EMI students compared with that of CMI students. Miss Lo explained why Grade-2 EMI students were active in general studies classes.

At the time of admission, EMI students had higher English levels than CMI ones... EMI students are active in class. They are confident in speaking in English. Most of them use English in their daily communication and some even chat with each other in English.

Mr. Gung's views are similar to those of Miss Lo. He added, 'Although EMI students need to memorise considerable vocabulary, they can keep up with the pace because of their high language learning competence.' He believed that the high language-learning competence of EMI students enabled them to acquire vocabulary effectively.

Third, all the three administrators mentioned 'parental support' in their interviews and believed that this contributed to the students' language performance improvement. When describing their selection criteria for the admission of EMI students, Mr. Lau said that they not only tested students' English proficiency via a placement test and an interview but also considered whether the parents were able to support their children at home.

We interviewed the parents and asked questions about parental support. We asked about students' English learning habits at home and inquired whether the students often use English.

Given the strong parental support, 'EMI students are more likely to improve their English and Maths' (Mr Gung).

Perceptions of the EMI teachers. Five EMI content subject teachers and one Chinese language teacher participated in the interviews. All EMI teachers expressed that English proficiency improvement among EMI students was relatively expected. As frontline teachers, they were familiar with both EMI and CMI students; therefore, four of them explained that the EMI students' improved performance could be because of their different characteristics from the CMI students. While Miss Fong (mathematics teacher; EMI teacher) and Mr Fung perceived that EMI students needed more time to learn the content subject terms and learnt the knowledge less quickly than CMI students, Miss Lai, Mr Smith (English language and general Studies teacher), Miss Fong, and Miss Lo believed that they benefited from the process and achieved the goals because they were 'more outspoken, motivated, and confident about their English level than their CMI counterparts.' Their active participation and involvement in the content subject classes better exposed them to the English language so that their proficiency was more obviously enhanced. Mr. Smith also mentioned,

I think these [EMI] students were already very disciplined and self-driven from the beginning. Hence, they are more willing and more accepting towards learning English.

Mr. Smith and Miss Lai further illustrated that the students' confidence and accepting attitudes could be attributable to their higher English level, particularly their higher speaking and writing skills, than those of their CMI peers. Teachers perceived that these qualities (e.g. self-discipline and confidence) also contributed to their better academic achievement in content subject learning. For instance, Mr. Smith reinforced the idea that EMI students excelled over their CMI peers in both English level and content-subject learning.

The Grade-3 EMI students also do well in other subjects. Quite a lot of them occupy the ranking from first place till ten in the whole form.

Mr. Smith's viewpoint was echoed by comments of Miss Hui' (Chinese language teacher; Putonghua teacher) regarding students' Chinese language proficiency. Although she observed that EMI students were more interested in learning English than Chinese and tended to use English in Chinese classes, they 'did well in Chinese and even better than CMI students'.

Although most EMI students at the target school seemed to make satisfactory progress in the immersion programme, Mr. Smith reminded the researcher to attend to some lower-proficiency learners who were 'quieter and more passive'. He provided an example,

I was teaching my class today, and there's this student who is one of the weakest in English in her classes. But her conversational English is really good. She's also really shy. She requires a lot of encouragement to just step out of the classroom and speak or to share her responses with her classmates. So I think she knows about it. She is well aware of it because on the report card, it shows your ranking for all the subjects in class ranking. So I feel like that demotivates her to speak out more.

This student demotivation was also observed when teaching other less-proficient learners. Some of them even decided to swap back to CMI classes afterwards (interview with Mr Smith).

Furthermore, all six teachers emphasised the crucial role of parental support in the development of the English proficiency of EMI students. For example, as Miss Lai mentioned, the higher socioeconomic status of EMI students and their parents created more opportunities for them to learn and use English. She explained that the school was located in a remote public-housing-dense town in a district with a largely poor population, and many parents were unable to focus on their children's academic needs. The parents of EMI students, however, were 'much more involved in their children's lives compared with those of CMI students' (interview with Mr. Smith). Miss Chan also found that the EMI students were well prepared in her music class (e.g. previewing the unit and familiarising themselves with new English terms), and therefore, she did not spend a lot of time illustrating the word meaning. This was because their parents guided them to preview the course materials beforehand.

In addition to parental support, Miss Fong pointed out that EMI students obtained more learning resources than their CMI peers.

There are fewer resources in Cantonese than those in Putonghua and English. For example, I want to find a video clip to explain some maths concepts, but it is difficult to find the ones in Cantonese.

In comparison, despite her agreement that teaching/learning content knowledge in English is very challenging, the students could, in her judgment, access more resources and learning platforms outside the classroom which helped them review the course content. Therefore, 'EMI students outperformed CMI students in both English learning and maths knowledge learning.'

In summary, the teacher participants attributed EMI students' improved English levels to their characteristics, parental support, and rich learning resources.

Perceptions of the parent. Ms. Leung's daughter, Yan, had been studying in the immersion programme for two years when the interview was conducted. When asked about her perceptions of the programme, Ms Leung felt happy as she stated 'Yan enjoyed her studies and improved her self-directed learning ability.' Yan improved her English, and therefore, she could share the content of a science book (English version) with Ms. Leung.

The climate of the immersion classroom is friendly and positive. Yan was able to monitor her learning and reads a lot. I am very satisfied with the programme.

Ms. Leung also shared with the researcher that parents were actively involved in their children's learning. For example, they frequently accompanied their children to music festivals. Their active involvement contributed to the effectiveness of the EMI programme.

Discussion

We collected multiple data sources from different stakeholders (i.e. EMI students, CMI students, panel heads, teachers, and parents) of an immersion programme to explore the programme's effectiveness on Hong Kong primary school students' development of English language proficiency. Although the sample size was relatively small and the number of CMI students was larger than that of EMI students, the sample represents the real situation in Hong Kong's local primary schools where CMI dominates. The findings, although not generalisable to other contexts, are meaningful because they reflect students' English language proficiency development and different stakeholders' perceptions of EMI in the primary school context, which has not yet received much attention in literature.

The findings of the proficiency tests revealed that EMI students obtained a higher level of English proficiency (in terms of listening, reading, writing, and vocabulary) than the CMI students, which was corroborated by interview data. Statistical analyses of the test scores showed that both EMI and CMI students improved their English levels at the end of the academic year. Although it is difficult to conclude the impact of the immersion programme on the EMI students' development of English proficiency, administrators, teachers, and parents valued the effectiveness of the immersion programme in improving the learners' English levels, especially their vocabulary knowledge. This finding echoes Serra's (2007) study in a primary education setting and other studies in secondary and tertiary settings (e.g., Lo & Lo, 2014). There are two reasons for EMI students' improvement. First, the students were frequently exposed

to the target language, not only in their English subject classes but also in content subject classes. Proper exposure in L2 is key to language acquisition (Chu, 2019). Their content subject teachers taught them L2 terminology and vocabulary both inside and outside the classroom which significantly enhanced their vocabulary knowledge base. Second, from the interview findings, the learners were confident, proactive, and motivated to learn; therefore, their personality and motivation may also contribute to their engagement in English language learning and improve their English levels (O Ceallaigh et al., 2017). While CMI students were not involved in EMI classes, they attended the same English proficiency course and were given the same bilingual vocabulary lists by their content subject teachers. The English proficiency courses and the list might also have contributed to their improvements in English levels. However, their speaking skills did not improve throughout the year. This is contrary to what Lindholm-Leary and Genesee (2014) observed, that students from whatever types of language immersion education usually perform impressively in productive language tests, speaking included. One possible reason is that owing to the examination-oriented culture in the Asian context (Berry, 2011), teacher-dominated classrooms are common and students might not be given many opportunities to speak English inside the classroom.

Regarding the different stakeholders' perceptions of the immersion programme, positive attitudes were reported and the interviewees generally valued the importance of EMI with various contextual considerations, which have not yet been discussed comprehensively in the current literature. The administrators perceived the programme as a way to cater to the needs of diverse learners, including Chinese- and non-Chinese-speaking students. They equipped students with an adequate English level to enhance their competitiveness for admission to prestigious secondary schools and ensure a smooth transition from primary to secondary education. Other stakeholders perceived that EMI students enhanced their English levels without compromising their Chinese language proficiency or content subject learning (Lo & Lo, 2014). The EMI students in this study were considered 'elite students' in this local school; they were self-disciplined (interview with Miss Lai) and self-driven (interview with Mr Smith). Therefore, it is understandable that they benefited from the immersion programme. However, Mr. Smith also mentioned that a few students dropped out because of their weak English skills.

Two perceptions of the stakeholders, namely language deficiency leading to drop out and L2 enhancement through immersion without L1 compromise, can be elucidated with reference to some theoretical frameworks in language acquisition. To begin with, bilingual education is not necessarily beneficial to all. Threshold Hypothesis developed by Cummins (2000; see also Cummins, 2021) specifies that when learners have not reached the lower threshold of their L2, the bulk of the input they receive in their immersion class would remain incomprehensible, which in turn handicaps their functioning in academic context. As a result, they would more likely fall behind easily in bilingual education programme. As for the welcoming absence of L1 compromise in immersion, Cummins (1979; see also Cummins, 2021) observed that regardless of the surface differences, languages share 'Common Underlying Proficiency' (CUP), which refer to cognitive and academic skills such as problem-solving, critical thinking, and literacy. Despite being developed in one language, those skills can be shared among other languages of the learner. This is a major tenet of 'Language Interdependence theory'. As the majority of the immersion students are proficient in L2, there is a healthy development of CUP. L1 proficiency may well be enhanced instead of being threatened in which case.

After discussing the learner factors, the stakeholders also pointed out some external factors that propel successful learning in the immersion setting. First, EMI teachers play a crucial role in ensuring the effectiveness of the immersion. From the interview findings, the content subject EMI teachers not only focused on teaching content knowledge but also explored effective methods to teach L2 terminology to their students. This further reinforces the recent call from the EMI literature about content teachers needing to help tackle learners' difficulties in using L2 to acquire content knowledge (Macaro, 2018). Collaborative lesson planning was also helpful in making decisions regarding the most effective teaching methods using collective wisdom. The results of collaborative lesson planning are not usually well-documented because of their informal nature. However, if the practices brainstormed and implemented can be made more explicit, outsiders such as EMI teachers of other content subjects and researchers will have more references for action and analysis, culminating a greater chance of successful immersion.

Second, parental support leads to students' success in immersion classes. Although existing literature (e.g., Carrio-Pastor, 2021) points out that one of the reasons for EMI education is parents' preference for bilingual education in mother tongue-traditional teaching, research exploring the role of parents in the process of EMI learning is scant. Our interview findings fill this research gap by emphasising that parental involvement is important for young learners. Third, the teacher participants perceived that rich L2 learning resources contributed to immersion effectiveness. As English is widely used, more learning resources can be accessed if students acquire content knowledge in English rather than in Chinese. If students have access to a wide range of learning resources, they can acquire knowledge more effectively.

Similar to the learner factors, external factors which are considered favourable by the stakeholders can also be elucidated with reference to some theoretical frameworks. The well-known Sociocultural Theory (SCT) (Vygotsky, 1987) states the importance of 'mediated learning'. Human and tools are the medium between the learner and the social activity world (Lantolf et al., 2014). In the case of immersion, the major human mediators are teachers, classmates and parents. As for the tools, they can be abstract (e.g. learners' memory) or concrete (e.g. teaching aids and youtube videos). Even the language itself, apart from being the goal, can be a useful tool too in the mediation process. Generally, the more purposeful interactions that are present in the learning process among learners, human mediators and the tools, the more effective learning experience would result, leading to an internalization of knowledge and acculturation within the individual's mind. Such development allows learners to favourably enlarge their Zone of Proximity (ZPD), the space between what the learners can do unaided, and what they cannot do with assistance. The favourable external factors aforementioned, namely effective teaching methodologies, parent involvement and support, and the availability of L2 learning resources, are all examples of human mediators and tools in learners' mediated learning. In addition, the factor of collaborative lesson planning is a demonstration of how teachers in this study co-construct knowledge together and capitalise on the benefits of SCT.

Conclusion

Overall, both the EMI and CMI students made progress in English language learning by the end of the academic year. Although it is difficult to conclude whether the immersion programme enhanced students' English proficiency more effectively than regular classes, deducing from the quantitative results of their test scores, interviews with different stakeholders revealed their positive attitudes towards the effectiveness of immersion. Administrators, teachers, and parents also attributed to the perceived effectiveness of immersion through three aspects, namely teacher support, parental involvement, and learning resources.

The research findings have implications from the school level and teachers' and parents' perspectives. At the school level, contextual factors may need to be considered when deciding whether immersion programmes should be launched for young learners (Grades 1–3). Immersion programmes may be implemented to address students' diverse needs and prepare them for future education in the context of EMI. Additionally, teachers' careful lesson planning, covering not only content knowledge teaching but also L2 support, contributes to the effectiveness of immersion. This is especially important for young learners whose L2 proficiency levels are relatively low and who are still developing their cognitive abilities. Collaborative lesson planning may also be implemented so that EMI teachers teaching the same discipline can meet and discuss the most appropriate teaching methods for their students. It is beneficial if brainstormed and implemented practices can be properly recorded for practitioners' and researchers' references. Moreover, given that parental involvement is essential for successful learning, schools may organise workshops or seminars on parent education to offer suggestions on how to support immersion in children's learning.

Notwithstanding these implications, this study has some limitations. Given the confidentiality policy at the target school and the small sample size, ANOVA tests were not conducted to examine the effects of immersion on test scores. It is difficult to conclude whether EMI students exhibited more significant improvements than CMI students. This problem needs to be addressed in future research to draw more

conclusive findings. Furthermore, more parents could have been interviewed in this study so that their voice can be heard.

Future research should explore the effectiveness of immersion programmes in primary schools. The effects of immersion on subject content learning and the development of L1 proficiency should also be investigated. The developmental trajectories of students' L1, L2, and content knowledge learning can be captured at different time points (e.g. at the beginning, middle, and end of the intervention). Findings of these empirical studies would construct a comprehensive picture of the effectiveness of immersion from different perspectives.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix: the coding scheme

Administrators	1. Attitudes towards EMI and reasons
	2. Perceived effectiveness of EMI on students' English learning and academic achievement and reasons
Teachers	1. Attitudes towards EMI and reasons
	2. Perceived effectiveness of EMI on students' English learning and academic achievement and reasons
Parent	1. Attitudes towards EMI and reasons
	2. Perceived effectiveness of EMI on students' English learning and academic achievement and reasons