Enhancing the effectiveness of English-medium instruction (EMI) courses: Chinese university students' perceptions and experiences

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Abstract

English-medium instruction (EMI) has been widely applied in many non-Anglophone countries to improve students' language ability as the same time as developing their subject knowledge. This paper reports on university students' perceptions of EMI courses in a Chinese context, focusing on their learning outcomes, the challenges they faced, their use of strategies and their interaction in class.

The four research questions are directly informed by the literature review and address the gap in research related, firstly, to EMI in a Chinese context and, secondly to the experience of students on EMI programmes as they relate to the challenges they face and their experience of lecturers from different linguistic and cultural backgrounds.

To ensure the robustness of the study, the data were collected both quantitatively and qualitatively through a questionnaire survey and semi-structured interviews with 84 participants in total from two universities in the east of China. The findings indicate that the students achieved improvements both in content and language which were sometimes related to their English proficiency. The main challenges were stress related to communication, particular speaking, and a lack of vocabulary. As expected, students with lower levels of English faced greater challenges. Students interacted with all their lecturers but slightly more with native speakers of English. Native speakers of Chinese were thought to teach more logically and were better able to explain difficult concepts. Students made more use of strategies related to others (peer learning and seeking help) and less use of their own resources (metacognitive strategies and critical thinking). Female students made more use of organization strategies than male students.

Generally, the study found EMI in this context was leading to the development of both language and subject knowledge but there was a need to provide extra support to students with lower levels of English, particularly related to vocabulary. Teachers who were native speakers of English and of Chinese had different strengths and neither group was preferred. Students made use of wide range of strategies but should be encouraged to make more use of self-directed strategies (metacognitive, critical thinking and stress management).

Contents

1 Introduction

With the development of globalization and the dominant role of English used in the world, bilingual education has emerged as a way of using two languages as medium of instruction to help students master the language through learning content knowledge (García & Baetens Beardsmore, 2009). In other words, students can both learn content knowledge and acquire a foreign language through bilingual courses. This approach to education advocates the interaction between teachers and students, rather than students just listening to the teacher in a foreign language in the whole lesson (Jenks & Seedhouse, 2015). It has been successfully implemented not only in bilingual or multilingual countries such as Canada, the United States, New Zealand and Luxembourg, but also in monolingual countries like Australia, Japan, Russia, Hungary and Bulgaria (Baker & Wright, 2017). Bilingual education has also been received attention in China as a way to enhance English learning (Wei & Feng, 2015). Bilingual education in Chinese context usually refers to English-medium instruction (EMI) using English as the teaching medium in several subjects and courses (Zhao & Dixon, 2018). EMI courses are mainly set up in universities, especially Sino-foreign cooperative institutions, and at present are also offered by some secondary schools (Wei & Su, 2015).

From the perspective of policy, bilingual education in many countries was initially based on the voluntary action of the local areas or schools (García & Baetens Beardsmore, 2009). With its expanded scales and excellent teaching results, bilingual

education has gradually been approved by government (Baetens Beardsmore, 1993; Swanwick & Gregory, 2007). Although China has already begun experimenting with bilingual and EMI teaching models, relevant laws and policies lag behind and need to be improved so as to guarantee and facilitate the implementation of this approach (Wei, 2013). In terms of the research on bilingual education, the foreign studies of this field are relatively mature and well-developed, compared with the domestic ones (Zhao & Dixon, 2018). The research on bilingualism and EMI in Chinese context is still limited at this stage. Therefore, it is essential that more studies should be conducted to explore the theoretical system and practice pattern which are appropriate for China's actual conditions.

This study aims to provide some evidence of students' perceptions of EMI courses in Chinese universities. The following sections of this paper briefly introduce the development and current situation of EMI in Chinese background and review the previous domestic and foreign literature concerning EMI in different contexts. In addtion, the methods and the procedures used to investigate university students' perceptions of EMI courses are reported. After that, I present the findings of the research and discuss some pedagogical implications for more effective EMI courses in China. Limitations of the study and directions for further research are also included in the end.

2 Background and context

2.1 English learning in China

Since English became the most widely used language in the world, English has been an indispensable part of education in a large number of countries (Galloway, 2017). The dominant status and great value of English is reflected in its frequent application in the fields of politics, economy and culture (Bamgboe, 2001). The globalization and increased communication between nations have further increased the demands of English and its learning. From 1978, English language teaching (ELT) has been enhanced continually with the deepening of reform and opening-up in China (Bolton, 2003). In the early years, Chinese ELT mainly attached importance to the reading ability on the basis of grammar and vocabulary, fitting the situation at that period when there was little foreign trade and few English speakers (Adamson, 2004). After China's accession to World Trade Organization (WTO) in 2001, the education of English has been received more attention to increase national resources and foreign policy development (Gil & Adamson, 2011).

The Chinese Ministry of Education has made English as a compulsory subject in primary school since 2005, instead of starting teaching English from middle school in the past (Bolton, 2003; Lam, 2005). It is also suggested by the Ministry of Education that students should learn English from Primary Three which means a starting point for students to be taught English systematically (Gao & Wang, 2017; Wei, 2013). Those who are in the areas with more openness and educational resources of higher quality, such as Beijing and Shanghai, even begin to learn English from their first year

in elementary school (Gil & Adamson, 2011). This transformation can be seen as a great breakthrough in Chinese education of English, showing more emphasis put on ELT in China. As it is required, students learn English as a subject for about nine years (if beginning from Primary Three), until their graduation from high school (Wei & Su, 2012). They will learn to master fundamental knowledge (pronunciation, vocabulary and grammar) and four basic skills (listening, reading, speaking and writing) of English language (Wei & Feng, 2015). In universities, students will learn English for two years to pass the College English Test Band 4 and 6 (CET-4 and CET-6), and those who major in English should take the Tests for English Majors Band 4 and 8 (TEM-4 and TEM-8) to prove their language proficiency. Besides, a number of students may study in off-campus institutions in preparation for IELTS and TOFEL, which can be of great value for their studying abroad and future job application (Kong & Wei, 2019).

In recent decades, much evidence of ELT development in China has shown up in various dimensions. One of the positive phenomena is that foreign teachers are gradually playing a more important role in Chinese ELT, and several first-tier and second-tier cities have employed native English speakers as teachers in order to improve the quality of English learning (Rao & Yuan, 2016). In addition, the country has set the orientation of giving more importance on listening and speaking abilities in these years' education reform: some exams such as the College Entrance Examination have increased the proportions of examining and assessing the two skills (Du & Guan,

2016; Gao & Wang, 2017). During the teaching practice in these years, there are also some negative aspects which can be unfavorable for effective English learning, however. A potential problem emerging in Chinese ELT is that students may still do not have enough use of English in or after class although they are usually more exposed to the target language from teacher talk than their first language (L1) (Sang & Hiver, 2021; Xie, 2017). When using English is not required strictly, students prefer to read and listen to materials translated into Chinese, or communicate with each other in the L1 rather than the target language even if they major in English. Apart from this problem, the exam-oriented education has made some students tired of learning and have a lack of interest in the language itself (Kirkpatrick & Zang, 2011). Only the knowledge and skills for passing exams are taught by teachers, for example, reading passages to answer fixed types of questions or writing for certain purposes, and students may not have access to other equally important elements of the language, such as using English to interact and thinking critically of opinions or statements (Lee et al., 2021; Xiong, 2019). Once out of such an exam-oriented teaching environment, learners are likely to feel anxious and even fail to achieve the desired effects when using English for particular aims.

2.2 EMI courses in Chinese universities

Conforming to the times, great attention has been devoted to English learning and teaching in China. With the popularization of English and progressive education reform, proceeding from the actual situation in China, EMI has emerged in Chinese

education since the late 1990s (Wei & Su, 2015). The Ministry of Education has emphasized that EMI should be applied in Chinese university courses from 2001, with a requirement that 5%-10% of courses (English major not included) should be taught in English (Hu & Lei, 2014; Ministry of Education, 2001). After that, more and more universities are encouraged to offer EMI courses and programmes under the policy of advancing bilingual education (Ministry of Education and Ministry of Finance, 2010). Generally, EMI courses in Chinese universities and English for Academic Purpose (EAP) or English for Special Purpose (ESP) courses in some institutions, aim to develop students' English proficiency and related skills in order to make preparations for learning academic subjects well (Li & Ruan, 2015; Liu, 2013). Although there have been many studies on EMI from different perspectives, exploring the effectiveness of Chinese EMI courses in terms of both content mastery and language gains is still necessary due to a substantial gap for the research on it (Bolton & Botha, 2015; Macaro et al., 2018). Moreover, it is importance for students to adopt proper learning strategies so as to maximize the efficiency of the courses (Tai & Tang, 2021; Wilkinson, 2015). Most of students in Chinese universities try to work out appropriate strategies according to their own learning in a particular stage. In spite of the nearly equal attendance or participation, students with distinctive strategies may differ from each other in achievements (Tai & Tang, 2021). As the number and range of previous studies on students' learning strategies are relatively small, especially in China, more in-depth evidence needs to be supplemented to give suggestions and implications for further development of Chinese EMI courses (Soruç & Griffiths, 2018).

2.3 Research context

The research was carried out in the east of China where the educational resources of those cities are advanced because of their economy and openness. EMI courses in the universities or other institutions are well established and comprehensive in such areas with reliable, adequate policies and strong support by the governments, and students' individual perceptions of the courses or programmes are quite diversified in the light of their experiences (Du & Guan, 2016). According to Zhao and Dixon (2018), one of the main benefits for Chinese university students to have EMI courses is that they could try to make full preparations for further studying abroad through these special courses. To be more specific, for one thing, they learn academic content for acquiring the knowledge of the subjects; for another, their English language proficiency can be improved so that they will be better adapted to living in foreign countries (Qiu & Fang, 2019; Serrano, 2010). Those who have the desire for overseas study tend to show much motivation to learn in EMI courses, and they also possess high needs of the gains from EMI courses (Jiang et al., 2019). Based on these points, the research targeted the students who take compulsory EMI or EAP/ESP courses rather than optional and not regular ones, which means almost all the lessons they have are entirely taught in English and last for a long time, i.e. at least 2-4 semesters. Besides, the students should take EMI courses for some special purposes, mainly for further education or future job seeking.

3 Literature review

According to Macaro (2018: 19), EMI refers to 'the use of English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the populations is not English'. With the increase in national policies toward EMI in quantities of countries, the courses and institutions with EMI have been growing in numbers these years (Fenton-Smith et al., 2017). Conforming to the requirements of globalization and internationalization, EMI has become an inevitable trend. Simultaneously, EMI is the institutions' strategic reaction to internationalization, and internationalization can be facilitated with the development of EMI courses (Doiz et al., 2011).

EMI courses usually have such a double advantage that students are able to learn content knowledge of subjects as well as practice their language use at the same time (Bolton & Botha, 2015; Macaro et al., 2018). To maximize the benefits, effectiveness of EMI courses should be ensured which can be influenced by a variety of factors, such as learning strategies used in courses, motivation and language proficiency, from perspective of learners (Dearden & Macaro, 2016; Yang, 2017). Another crucial factor may be teacher variables, such as language of instruction, teaching methods and views on their teaching roles (Jiang et al., 2019). Hence, it is of vital importance to have a systematic review of the relevant literature on EMI from different dimensions in order to find more existing evidence and research gap of effectiveness of EMI courses in China.

3.1 Effectiveness of EMI in higher education

A great deal of previous research has confirmed that EMI in higher education (HE) is one of the most effective ways for learners' improvements in language proficiency (Wesche & Skehan, 2002). It is also shown that the growth of EMI in HE that may differ owing to policies of different areas such as Europe, the Middle East and Asia (Bolton & Botha, 2015; Macaro et al., 2018). Nevertheless, much concern has shown up with the development of EMI, related to whether the effectiveness of courses or programmes can be ensured and extended for increasing other competences or knowledge (Kim, 2002; Yip et al., 2007). Researchers have conducted plentiful studies and provided empirical evidence for this topic. As a result of the study on students' and lecturers' perceptions of effectiveness of EMI in a Turkish English-medium university, Kirkgoz (2009) notes that the skills-based EAP courses need to be improved due to their insufficiency in effectively developing students' academic abilities to meet the requirements. Other mixed-method research on EMI in East and South Asia, such as Hong Kong, South Korea and Bangladesh, note that students encounter challenges in understanding lectures as well as academic vocabulary, interacting with teachers or peers, and meeting disciplinary requirements (Evans & Morrison, 2011; Joe & Lee, 2013; Kim et al., 2014; Sultana, 2014). These studies mainly focus on students' experiences and perspectives of EMI courses through the questionnaires and semi-structured interviews. According to Evans and Morrison (2011: 198), 'students are able to overcome these and other problems

through a combination of strong motivation, hard work, effective learning strategies and supportive peer networks.' Despite these methods, it is apparent that the effectiveness of EMI courses be considered carefully through the appearance of such problems (Doiz et al., 2012).

From the research on the implements of EMI in Chinese and Japanese universities, several factors can have positive or negative impacts on the effectiveness of EMI courses based on students' and teachers' views:

First, language policy, including three components (language ideologies, language practices, and language management mechanisms), may influence the effects of EMI class a lot (Hu & Lei, 2014). Hu and Lei (2014: 567) mention that 'there was a hiatus between the magnificent goals of EMI envisioned in policy documents and the compromised language practices found in the classroom', which means adjustments should be made of EMI in Chinese education to be consistent with the actual situation and stakeholders' needs.

Second, students have reported that EMI teachers do matter in advancing the quality of English-medium teaching (Jiang et al., 2019; Qiu & Fang, 2019; Sun et al., 2015). To be more specific, students' learning tends to be associated with teachers' views of courses, their designs of a particular lesson and the way they teach in EMI class (Sun et al., 2015). Jiang et al. (2019) state that EMI teachers are supposed to be qualified

not only in English level, but also with proper teaching skills, in order to achieve the balance of teaching content knowledge and language. Meanwhile, from learners' perspectives, the two typical types of EMI teachers, native English-speaking teachers and local (non-native English-speaking) teachers, have differences in their teaching behaviors in Chinese EMI courses (Qiu & Fang, 2019). According to their findings, native English-speaking teachers usually adopt more interactive approaches and various activities in class but have a lack of intercultural competence, while local teachers with more dominant roles can better deal with problems related to culture; students prefer a combination of the above features to increase the effectiveness of EMI (Qiu & Fang, 2019). Hence, educators should take into account how to train EMI teachers and fit students' needs so as to make English-medium courses in HE more effective.

Third, the role of self-efficacy beliefs can drive the success of EMI courses on a basis of the participants' test scores and interviews (Rose et al., 2020; Thompson et al., 2019), which support the conclusion of the study conducted by Bandura (1997) that self-efficacy beliefs can be strong catalysts for better performance in learning. Preparatory ESP/EAP courses may be a useful tool for enhancing the effectiveness EMI curriculum as they can give students opportunities of gaining experience and self-efficacy (Thompson et al., 2019).

Fourth, it is essential that language support be provided for students in EMI courses

(Bradford, 2013; Galloway & Ruegg, 2020; Zhang & Pladevall-Ballester, 2021). Galloway and Ruegg (2020) note that EMI teachers should pay much attention to learners' difficulties and try to facilitate their understanding of knowledge, based on the students' responses. Specifically, for the effectiveness of teaching, more explicit instruction of academic vocabulary and writing skills, scaffolding of the materials, and encouragement for more use of English need to be involved in EMI courses (Galloway & Ruegg, 2020; Zhang & Pladevall-Ballester, 2021). Besides, students should be made aware of the support offered in EMI to avoid anxiety of the learning (Zhang & Pladevall-Ballester, 2021).

3.2 Students' perceptions of learning in EMI classroom

Tatzl's (2011) study on the attitudes and experiences of Austrian students and teachers towards EMI courses mentions that in principle the stakeholders favor EMI and acknowledge the importance of it in language improvement. Aside from this, a wide range of research has shown various evidence related to perceptions of students of their learning experiences in other EMI contexts. By reviewing the subjects of EMI courses, we can have a comprehensive understanding of those results and limitations of the research.

3.2.1 Balance of content and language

To begin with, Chinese students' views of the courses show that they do not pay much attention to learning English (Hu & Wu, 2020) , which is considered as a supplement

to the study conducted by Yang (2017) on the balance of content and language in EMI classroom. Although they have expectations of promoting their language level, the students think such expectation a 'subsidiary benefit' rather than one of the goals in EMI; in other words, there exists an imbalance of content and language learning that students make more efforts to content mastery than language improvement (Hu &Wu, 2020; Yang, 2017). How to balance the two kinds of knowledge in EMI and accomplish twice as much with half the effort is an issue worth thinking about. The findings indicate some implications for further curriculum planning in an all-round and realistic way based on learners' perceptions and needs.

3.2.2 Beliefs of autonomy in learning

Other studies in Chinese context reveal significant changes in students' beliefs after their one-year learning in EMI courses (Jiang & Zhang, 2019; Li & Ruan, 2015). According to Jiang and Zhang (2019: 339), one of the changes is that 'how students make sense of teachers' instructional language use and classroom activities as benefiting English learning, and how they take actions to learn English where English learning falls largely to their own charge', which lends support to the relevant theory of contextual elements and learning agents (Barcelos, 2015; Dafouz & Smit, 2016). Similarly, it is concluded that despite the language challenges emerging in the courses, students begin to realize the necessity of higher levels of autonomy instead of relying too much on their teachers (Li & Ruan, 2015). With much autonomy in learning, students can be motivated and actively participate in interaction, leading to more

outcomes in EMI. In contrast to the results of some previous studies, students' beliefs in EMI or EAP courses are not stable but dynamic and can change with their learning experiences (Jiang & Zhang, 2019). Therefore, in order to shape students' autonomy and foster their learning in EMI, instructors should attach importance to their roles and various elements of the class, such as teaching language, activities and supporting resources (Dearden, 2018).

3.2.3 Interaction in class

In addition, effective interaction appears to be another crucial factor accounting for a successful EMI classroom (Doiz et al., 2012; Klaassen & De Graaff, 2001). The interaction-oriented constructivist view of science teaching has demonstrated that those misunderstandings of knowledge learned can be changed through the communication between teachers and students; this is seen as the core of learning (Chin & Osborne, 2010). Likewise, as language plays an essential part in EMI, it is inevitable that interaction would influence the class teaching to a large extent. When it comes to students' perceptions of interaction in EMI courses, the research in different contexts, such as South Korea, China and Italy, has more or less suggested that the students do not have high level of interaction in class despite their awareness of its importance (Kim et al., 2017; Ma et al., 2021; Rowland & Murray, 2020). From the interviews and observation of the class, such lack of interaction can be reflected in the consistency between students' tendency of depending on teacher talk and the high proportion of teacher monologue (Ma et al., 2021). Students are likely to keep silent

as long as they are not required to answer questions or convey information (Kim et al., 2017; Rowland & Murray, 2020). According to An and Thomas (2021), students' willingness to communicate (WTC) can fluctuate during the class and is affected by three dimensions: individual, contextual, and social-cultural and educational factors. Students' WTC may be increased/decreased by these factors, such as motivation, expectations, teaching content, teachers' roles, or dependency on L1, which proves the argument of factors affecting learners' WTC and second language (L2) use in communication proposed by MacIntyre et al. (1998). The above findings imply that interaction is possibly linked to students' choice of language to use in class. Evidence from South Korean students shows their invariable support for L1 use in EMI and the belief that complex materials should be explained in the native language, though English-only instruction is widely favored (Kim et al., 2017). It is the L1 that makes the students confident and willing to interact with others in EMI classroom. However, in Italian EMI context, students have flexible attitudes towards L1 use and they prefer to move out of the comfort zone to get more exposure to English; their dependency on mother tongue is likely to be lower as time goes on, and the interaction appears to be relatively effective as they grasp opportunities to practice spoken English (Rowland & Murray, 2020). The research has indicated that a less radical, transitional way adopted in the language use may be the most practical and ultimately productive for efficient interaction in EMI (Guarda & Helm, 2017; Rowland & Murray, 2020).

3.2.4 Preference for language backgrounds of lecturers

It is worth noting that, as Rowland and Murray (2020: 245) mention, 'the need for lecturers to engage in professional development that enables them to adjust language and content to ensure comprehensibility is surely greater'. Also, Kim et al. (2017) suggest that the training of EMI lecturers should be enhanced and redirected for coping with the ineffectiveness and dissatisfaction of the courses. This has led to an issue that whether the native English-speaking or non-native English-speaking background of teachers is relevant to effective teaching and learning in EMI (Inbar-Lourie & Donitsa-Schmidt, 2020; Karakas, 2017). A study in an Israeli EMI context indicates that moderately the students prefer native speaker (NS) teachers to non-native speaker (NNS) teachers (Inbar-Lourie & Donitsa-Schmidt, 2020). Besides, Inbar-Lourie and Donitsa-Schmidt (2020) note that the preference for NS teachers varies in different groups: students at teacher education colleges are less favorable of NS English lecturers, compared with those at research universities; students with lower-level self-assessed English proficiency prefer NNS teachers. Such findings agree with the viewpoints of previous research on EMI that learners with higher-level academic competences favor NS lecturers while those with lower ones show a preference for NNS teachers (Karakas, 2017). The results of the study on Chinese EMI students are not quite the same as the above ones. According to Qiu and Fang (2019), Chinese undergraduate students learning in a chemistry EMI programme have different perceptions of the two types of lecturers. To be more specific, the students are more favorable to the adequate and efficient interaction in NS English teachers' classroom, but they prefer local Chinese-speaking lecturers with respect to the

intra-/inter-cultural competences for EMI teachers, which is closely related to the use of L1 in class as well as the intelligibility and comprehensibility of lectures (Qiu & Fang, 2019). In other words, both groups of teachers have their merits in language medium of instruction, and students may have special needs in different aspects of EMI classroom. Hence, it is suggested that lecturers of different language backgrounds pay attention to their weaknesses to be improved, and exchange their teaching experiences and methods to learn from each other (Aguilar, 2017; Joe & Lee, 2013; Qiu & Fang, 2019).

3.2.5 Instrumental benefits of EMI and students' satisfaction

Last but not least, some other dimensions of EMI, such as its instrumental benefits and students' satisfaction of it have been investigated in a few studies (Macaro et al., 2018). One of the studies in a Turkish EMI context has found that expectations of improving English and going abroad for further study seem to be the main driving forces for the participation in the programme (Macaro & Akincioglu, 2018), which is in accord with the previous view that internationalization and student mobility have greatly promoted EMI (Hu et al., 2014). Similarly, from the study on Turkish students' perceptions of EMI courses, Ekoç (2020: 243) also mentions that 'EMI boosts the confidence of Turkish students' as well as 'enhances prestige, international exchange and students' employability at both local and global levels'. Such instrumental benefits of EMI courses have provided more opportunities for students to improve their own abilities and competitiveness. Besides, another significant discovery related

to the satisfaction with EMI is that the gender variable may cause some of the differences in positive attitudes towards the programmes: females are more positive than males about the functions of enhancing language proficiency and motivating students (Macaro & Akincioglu, 2018). Therefore, in order to ensure high quality of EMI courses, educators should take into consideration individual or group variations (Macaro & Han, 2020; Werther et al., 2014).

3.3 Learning strategies used in EMI curriculum

Learning strategies, which matter in the field of language instruction, are influential in successful acquisition and storage of new information and skills (Chamot & Kupper, 1989; Oxford & Nyikos, 1989). So far, definitions of learning strategies have varied in different periods, and one of the most popular ones is 'specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations' (Oxford, 1990: 8). Common strategies can be divided into seven categories: memory (remembering more effectively), cognitive (using all your mental processes), practice (overt out-of-class self-practice methods), compensation (compensating for missing knowledge), metacognitive (organising and evaluating learning), affective (managing emotions), and social (learning with others) strategies (Oxford, 1990; Oxford & Burry-Stock 1995; Oxford 1996). If students apply proper strategies, they are likely to reach their goals more easily and efficiently. This is true for language learning. According to Griffiths (2008: 87), strategies in language learning refer to 'activities consciously

chosen by learners for the purpose of regulating their own language learning'. The choice of language learning strategies can be affected by several factors, such as language proficiency, level of course, degree of metacognitive awareness, gender, affective variables (e.g. attitudes, motivation), or specific personality traits (Oxford & Nyikos, 1989). Good language learners tend to use a variety of strategies and make adjustments depending on the contexts, learning goals and their personal characteristics (Griffiths, 2015). Meanwhile, appropriate use of different strategies can lead to the success of language acquisition to a large extent (Griffiths, 2008). Hence, it is a necessity to study students' use of strategies in EMI courses to explore more possibilities for effective learning.

The research in Korean EMI context reported that the students relied more on practice and compensatory (e.g. self-practicing, inferring and guessing) strategies than social and affective (e.g. interaction, seeking help, checking attitudes and not worrying about mistakes) strategies; their choices of learning strategies and methods appeared to correlate with motivation (Lee & Lee, 2018). The findings to some degree support the evidence provided by Pokay and Blumenfeld (1990) that use of strategies could be affected by students' motivation, both of which may have impacts on learning achievements. Besides, there are consistent, moderate relationships between some of the students' strategies and their self-efficacy for English skills, for example, memory strategies and general skills (e.g. listening and writing); students may need to be instructed in and more aware of these relationships to improve their repertoire of

language skills (Lee & Lee, 2018).

Based on the results of video-recording, an open-ended questionnaire and stimulated-recall interviews, the Turkish students may be confronted with difficulties in EMI courses, and they seemed to clearly know the importance of learning strategies which could help them effectively solve the problems, such as asking questions, visualizing, using a dictionary and thinking critically (Soruç & Griffiths, 2018). Soruç and Griffiths (2018: 46) also mention that 'perhaps the area where fewest strategic ideas were forthcoming was in the affective domain' and 'nobody really suggested any ways of dealing with these problems'. This point has been partly supplemented by the subsequent research in a Taiwanese university focusing on the role of learning strategies in EMI (Tai & Tang, 2021). It was found that some strategies adopted by the students could reduce language anxiety, such as organization, critical thinking and metacognitive self-regulation strategies (Ghonsooly & Loghmani, 2012; Graham et al., 2018; Liu, 2013). Among these strategies, the study results showed that critical thinking is the only one that has a significant effect on the anxiety; students would be more confident and experience less anxiety by performing critical thinking in class (Tai & Tang, 2021). Aside from that, another study on the perceptions of Omani engineering students has reported that appropriate learning strategies could enhance comprehension of lectures, and the key strategies are using L1 as compensation, translating, peer and group support, and opting for English tuition classes (Ali, 2020). Such coping strategies are usually adopted depending on actual situations of learning,

and enable students to deal with different challenges in EMI courses. Soruç and Griffiths' (2018) view is that strategies for EMI learning are mainly cognitive and metacognitive. In addition, the study in a Macau EMI context which investigates the strategies used in the courses adds that 'such strategies are also mediated by contextual realities and the tools that they have access to' (Yu et al., 2020: 468). In short, students' strategies in EMI are not only influenced by several factors, but also capable of having great effects on learning.

3.4 The role of language proficiency in EMI

It was often emphasized in previous studies that student language proficiency plays an important role in English-medium subjects (Stryker & Leaver, 1997; Swain & Johnson, 1997), and the subsequent research has investigated the effects of English proficiency on learning in EMI from various dimensions.

In the first place, the study in Korean context conducted by Joe and Lee (2013) reveals that students' level of understanding of EMI lectures were not determined by their general English proficiency (GEP). This finding has been supported by the study on Turkish students' learning EMI which suggests that GEP is not a predictor with statistical significance of academic success in EMI (Curle et al., 2020). Curle et al. (2020: 5) mention that 'when the English language support given to students before or during their EMI studies is not specifically related to EMI academic content, a student's general English proficiency level does not affect their success in EMI'.

However, it should be noted that all the participants had attained an advanced level of GEP, which means most of medical students were proficient English learners because of quite high cut-off scores in whichever university the medical school was housed within (Joe & Lee, 2013). Thus, the conclusions related to Korean medical students may not be applicable for other student groups and EMI contexts.

Then, in contrast to the above findings, the research in some other Asian countries such as China and Japan has found different evidence regarding the role of language proficiency in EMI (Rose et al., 2020; Thompson et al., 2019; Xie & Curle, 2019). According to Xie and Curle (2019), the English proficiency of business students was able to predict their academic success, resonating with Li's (2018) discovery that English proficiency was the strongest predictor of learning outcomes of students who majored in social science. Moreover, on a basis of the qualitative data, compared with higher proficiency students, those with lower proficiency appeared to be at a disadvantage in content score attainments (Rose et al., 2020). Besides, English proficiency can affect students' performance in content courses, and students with lower proficiency may experience more challenges in EMI courses (Thompson et al., 2019). In terms of self-efficacy, which is a direct predictor of successful learning in EMI, lower-level students tended to strongly care about (perceived) L2 ability, so they would need more language support to improve their self-efficacy (Rose et al., 2020; Thompson et al., 2019).

Lastly, some other studies have found that there exists a linear relation between language proficiency and learning in EMI, but discrepancies also show up in groups with different levels of proficiency related to their achievements in language skills (Aguilar & Muñoz, 2014; Aizawa et al., 2020). Based on the test results, Aguilar and Muñoz (2014) note that the effect of English proficiency was more advantageous for less proficient students, while students with an advanced initial level of proficiency in English did not apparently have any gains in listening or grammar skills. Similarly, it has been confirmed that 'significant differences existed across most groups for most language skills, even at the higher levels', and it is difficult to establish a English proficiency threshold for noticeably decreasing language problems in EMI courses (Aizawa et al., 2020: 19).

3.5 Summary of previous research

To sum up, the review of literature indicates that previous research on the effectiveness of EMI courses from students' perspective mainly explored the influences of different variables on their perceptions of satisfaction, challenges and learning outcomes. Although a few studies have examined student and teacher variables or other factors in classroom, there are still some gaps to be filled in further research: (1) not all the previous suggestions are applicable for every context and the studies set in Chinese university EMI context are quite few; (2) it is necessary to investigate Chinese students' difficulties as well as their learning outcomes of general skills and language in EMI so as to improve the deficiencies; (3) there is not sufficient

evidence of Chinese students' choice and use of learning strategies in EMI; (4) English language proficiency could affect students' perceptions of EMI effectiveness according to past studies, which needs more supporting evidence for regulating Chinese EMI courses in the future; (5) the methods used in some of the previous studies were single and not persuasive enough, so more reliable methodology should be applied in further study (Azawa et al., 2020; Qiu & Fang, 2019; Soruç & Griffiths, 2018).

4 Methodology

4.1 Research questions

Based on the literature review, four questions were highlighted to guide the research as the relevant evidence were scarcely examined in previous studies:

1. Does university students' language proficiency affect their perceptions of the content and language improvements in EMI courses in Chinese context?
2. What challenges or difficulties do Chinese university students perceive that they are experiencing/have experienced in EMI courses?
3. How do Chinese university students perceive the interaction in EMI lectures given by teachers with different language backgrounds (i.e. native and non-native English speakers)?
4. What learning strategies do university students use to deal with EMI in Chinese context? Is there any gender difference in students' use of strategies in EMI courses?

4.2 Research design

A mixed-methods approach was adopted in this study. According to Creswell (2015), mixed methods research refers to using both qualitative and quantitative methods to collect and analyze data, and then integrating findings as well as making inferences in studies. Although quantitative or qualitative method has solved a large number of problems in previous research of many fields, some questions cannot be answered by studies with single method (Tashakkori & Teddlie, 2016). In this case, it is necessary that mixed methods should be taken into consideration. As the questions of this study on Chinese university students' perceptions of EMI courses needed to be addressed with evidence of various aspects, such as their experiences, strategies and English proficiency. As to RQ1 and RQ4, the quantitative method would be a useful way to address the questions about extent and relation of variables. For RQ2 and RQ3, more qualitative data should be added to better understand and analyze the evidence which the participants had provided. Hence, a combination of quantitative and qualitative approach was used in order to increase the sources of data, and expand the breadth and depth of the research (Creswell & Clark, 2017).

4.3 Participants

The study was conducted at the two universities in the east of China, both of which are Sino-foreign cooperative institutions offering compulsory EMI or EAP courses. According to the policies and syllabuses of the universities, all the courses will be

taught in English except ideological and political course. In the valid respondents, 51.19% (N=43) were females while 48.81% (N=41) were males. All of them were Chinese students studying in the universities, aged from 19 to 23. To be specific, 90.48% (N=76) were undergraduates ranging from sophomores to senior students, and 9.52% (N=8) were postgraduates. The participants majored in eight different fields, such as Biomedical Science, Information and Computing Science, and Civil Engineering (see Table 1). They had been learning English for at least eight years by the time the data were collected. Based on *Common European framework of reference for languages* (CEFR) scales (Council of Europe, 2011), the self-assessed language proficiency could be divided into five levels from low to high: Beginner (A1), Elementary (A2), Intermediate (B1), Upper-intermediate (B2) and Advanced (C1) (see Figure 1).

Field	Number	Percentage
Biomedical Science	19	22.62%
Information and Computing Science	20	23.81%
Civil Engineering	9	10.71%
Mechanical Engineering	4	4.76%
Digital Science	4	4.76%
Accounting	7	8.33%
Education	6	7.14%

Electrical Engineering	14	16.67%

Table 1. Fields that the participants major in

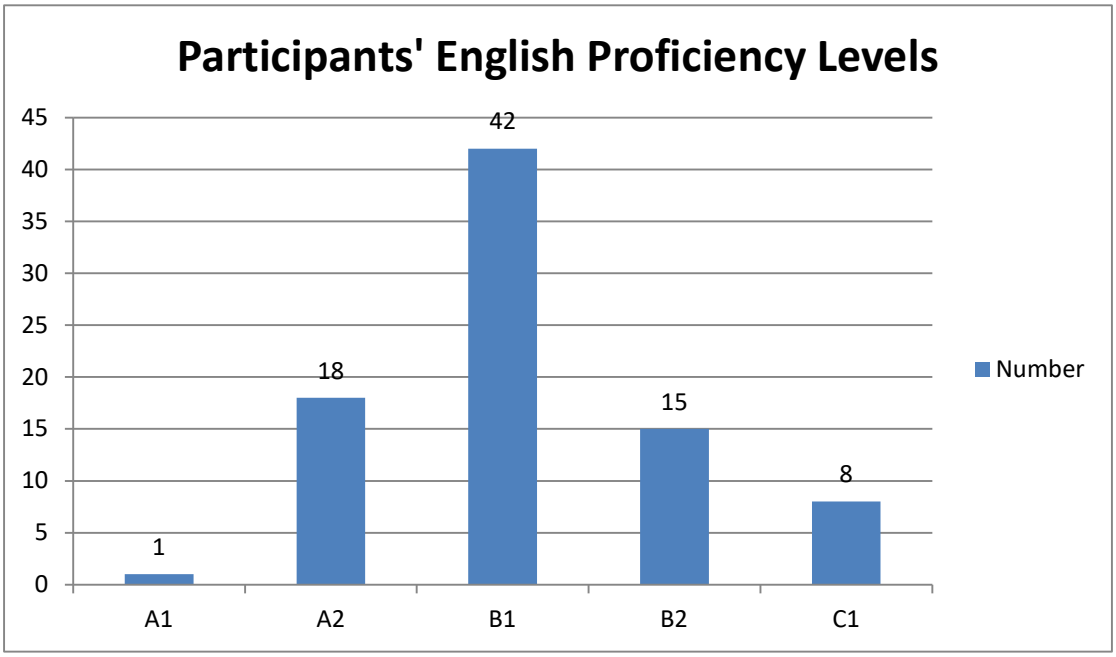

Figure 1. The participants' English proficiency levels

4.4 Data generation

The data generation instruments consisted of two different parts: questionnaire survey and semi-structured interview, both of which are detailed in the following paragraphs.

4.4.1 Questionnaire survey

A questionnaire survey on Chinese university students' perceptions of effectiveness of EMI courses and their strategies used in learning was developed for the study. The participants took this survey voluntarily. Based on Yang's (2017) questionnaire to examine the balance of students' content mastery and language improvements in EMI,

and Pintrich's (1991) Motivated Strategies for Learning Questionnaire (MSLQ) (the learning strategies section) for investigating students' motivation and use of learning strategies, some adaptations were made in the designing of the questionnaire. Besides, three undergraduates were invited to take part in the pilot interviews regarding their challenges, learning experiences and outcomes in EMI courses, and some question items were developed according to their responses. A few items in the questionnaire were also developed by referring to the previous research (Evans & Morrison, 2011; Hu & Wu, 2020; Sun et al., 2015; Tatzl, 2011; Xie & Curle, 2019). Besides, the scales of CEFR (Council of Europe, 2011) and their comparison with IELTS scores were illustrated in the questionnaire survey regarding students' self-perceived English proficiency (see Figure 2). To facilitate reading, the questionnaires were made Chinese-English bilingual and participants could fill in them either of the two languages. The aims of the questionnaire survey and research details were explained at the top of the questionnaire. It was also promised that any personal and relevant information of participants would not be revealed to the public, and all the respondents were anonymous in completing the questionnaires; all the data collected would only be used for academic research, and after analyzing the results of the questionnaire survey, the data and related notes would be stored confidentially in a secure location. Due to the restriction on space and communication caused by COVID-19 pandemic, the questionnaire was electronic and then sent online via WeChat or emails to the participants.

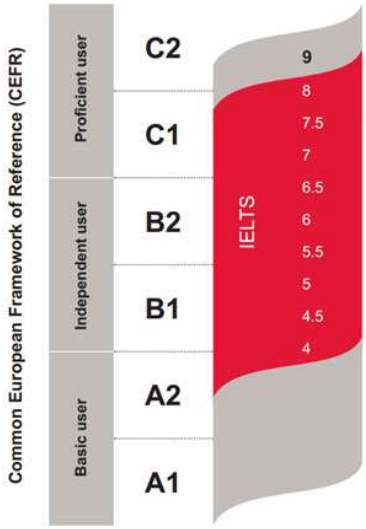

Figure 2. Comparison between Common European Framework of Reference (CEFR) to Scores of International English Language Testing System (IELTS) (https://www.ielts.org/ielts-for-organisations/common-european-framework)

The questionnaire mainly included two parts. One of them was designed to collect the participants' background information, such as their gender, current degree, major and overall English proficiency. The other part contained 18 five-point Likert scale items (ranging from 1=strongly disagree to 5=strongly agree) about the students' learning experiences in EMI courses as well as a multiple-choice question (participants could select all that apply) related to their difficulties in the learning. These items covered their satisfaction, improvements, problems and use of strategies in EMI courses. The participants needed to rate to what extent they agreed with the statements of their learning experiences and improvements in EMI courses. The Cronbach α for the 18 items was 0.864 examined by SPSS software, which indicated that the questionnaire survey had high reliability (Eisinga et al., 2013). The KMO for the items was 0.783 based on KMO and Bartlett test, showing good validity (0.7~0.8) of the questionnaire

(Chung et al., 2004). In addition, an open-ended question (optional) was added in the end to invite the students to freely share some other ideas or suggestions about EMI courses.

In total, 100 questionnaires were sent out with 90 returned. Seven invalid questionnaires have been excluded for the incomplete information, and the other 84 were eligible for further analysis.

4.4.2 Interview

Semi-structured one-to-one interviews were conducted for more in-depth information regarding students' perceptions of EMI in Chinese universities. All the participants who had completed the questionnaires were invited to be interviewed; only four students agreed and provided their contact information voluntarily. The interviewees would be named Student 1 (S1), Student 2 (S2), Student 3 (S3) and Student 4 (S4) in the report of this study in order to ensure the anonymity. The interview protocol (see Appendix 1) was based on the interview questions of previous studies, concerning students' attitudes towards the challenges, content and language improvements, and effectiveness of EMI courses (Sun et al., 2015; Tatzl, 2011; Xie & Curle, 2019). Some questions about basic information of the courses, students' performance in class and teachers' language background were also asked. Before the interview started, electronic copies of the consent forms (both Chinese and English versions) (see Appendix 2 & Appendix 3) had been sent to the participants and signed by them after

careful perusal. The detailed information of this study had also been clearly informed to them. Due to the restriction on space and communication caused by COVID-19 pandemic, the interviews took place online instead of face to face, which had been approved by the interviewees. In order to make the process more smooth and reduce the anxiety caused by the language in communication, the participants' L1, Chinese, was used in the interviews. The participants accepted that their voices rather than videos could be recorded, so the voice calls on WeChat were used in the study. Each interview lasted about twenty minutes on average. All the recordings and notes have been stored confidentially in a secure location and will not be accessible to the public.

4.5 Data analysis

As to the quantitative data, part of the valid responses of questionnaire survey were imported into and analyzed by JASP software. Simple linear regression was used to explore the relationship between learners' language proficiency and improvements in EMI courses. Descriptive statistics were used to indicate the variables concerning the effectiveness, learning outcomes and strategies of the EMI courses. After the interviews, the recordings in Chinese were transcribed and translated into English by the researcher. The qualitative data of the participants' perceptions of the EMI courses were analyzed by taking a thematic analysis approach (Creswell & Clark, 2017; Gibbs, 2007). The interview data were divided into sets of common patterns and ideas, each of which was analyzed separately. Codes were developed by the data to produce a few themes that could support relevant data.

5 Findings

5.1 Research question 1: Improvements achieved in EMI courses

5.1.1 Content and language improvements

In the questionnaire survey, the participants were asked to assess their improvements achieved in EMI courses by filling in the related five-point Likert items. The items covered improvements in content and language. Content improvements was connected with the knowledge of subjects or disciplines. Language improvements were split into the improvements in four basic skills: listening, reading, speaking and writing. The descriptive statistics are presented below (see Table 2):

	content knowledge	**listening**	**reading**	**speaking**	**writing**
Valid	84	84	84	84	84
Mean	3.476	4.071	4.179	3.345	3.643
Std. Deviation	0.871	0.941	0.779	1.114	1.094
Minimum	1.000	1.000	2.000	1.000	1.000
Maximum	5.000	5.000	5.000	5.000	5.000
Sum	292.000	342.000	351.000	281.000	306.000

Table 2. Descriptive statistics of students' self-perceived content and language improvements in EMI courses

The table displayed an overall description of the scores of the five items: improvements in content knowledge (Mean=3.476, SD=0.871), listening (Mean=4.071, SD=0.941), reading (Mean=4.179, SD=0.779), speaking (Mean=3.345, SD=1.114) and writing (Mean=3.643, SD=1.094). This demonstrated that the students had made some improvements in both content knowledge and language ability. Among these items, the average score of improvements in reading (4.179) was the highest while that of improvements in speaking (3.345) was the lowest, which means the students perceived that their reading skill had been improved quite a lot while less progress had been made in speaking through EMI courses. Besides, the average scores of the other items revealed more developments in listening ability than content knowledge and writing.

5.1.2 The influence of language proficiency

Figure 1 in the previous section has shown the participants' self-perceived English proficiency levels, ranging from A2 to C1 of CEFR scales. As to research question 1, regression analyses were applied to investigate whether students' language proficiency could obviously affect their improvements in the five aspects. Before the regression analyses, correlations had shown that there were connections between language proficiency and three of the items. Simple linear regression indicated statistically significant relationships between language proficiency and improvements in content knowledge, reading and speaking skills. The results are as follows (see Table 3, Table 4 and Table 5):

Model Summary - content knowledge

Model	R	R^2	Adjusted R^2	RMSE
H_0	0.000	0.000	0.000	0.871
H_1	0.257	0.066	0.055	0.847

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p
H_0	(Intercept)	3.476	0.095		36.583	< .001
H_1	(Intercept)	2.699	0.336		8.045	< .001
	English proficiency	0.248	0.103	0.257	2.408	0.018

Table 3. Linear regression of students' English proficiency and content improvement in EMI courses

From Table 3, there existed a statistically significant relationship between English proficiency and improvement in content knowledge ($F(1,82)=5.800$, $p=0.018<0.05$). The content knowledge scores increased by 0.248 for every point increase in English proficiency. The R^2 value was 0.066, which means that 6.6% of the variance in

content improvement in EMI courses could be explained by English proficiency.

Model Summary - reading

Model	R	R^2	Adjusted R^2	RMSE
H_0	0.000	0.000	0.000	0.779
H_1	0.258	0.066	0.055	0.757

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p
H_0	(Intercept)	4.179	0.085		49.185	< .001
H_1	(Intercept)	3.482	0.300		11.610	< .001
	English proficiency	0.223	0.092	0.258	2.417	0.018

Table 4. Linear regression of students' English proficiency and reading improvement in EMI courses

Table 4 shows a statistically significant relationship between English proficiency and improvement in reading ($F(1,82)=5.841$, $p=0.018<0.05$). The reading scores increased by 0.223 for every point increase in English proficiency. The R^2 value was 0.066,

indicating that 6.6% of the variance in improvement of reading could be explained by students' English proficiency.

Model Summary - speaking

Model	R	R^2	Adjusted R^2	RMSE
H_0	0.000	0.000	0.000	1.114
H_1	0.218	0.048	0.036	1.094

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p
H_0	(Intercept)	3.345	0.122		27.524	< .001
H_1	(Intercept)	2.502	0.433		5.773	< .001
	English proficiency	0.269	0.133	0.218	2.025	0.046

Table 5. Linear regression of students' English proficiency and speaking improvement in EMI courses

There was also a statistically significant relationship between English proficiency and improvement in speaking ($F(1,82)=4.100$, $p=0.046<0.05$). From the table, the

listening scores increased by 0.269 for every point increase in English proficiency. The R^2 value was 0.048, indicating that 4.8% of the variance in speaking improvement could be explained by students' English proficiency.

In short, Chinese university students' language proficiency could affect their perceptions of the improvements in content knowledge, reading and speaking abilities in EMI courses. Besides, no statistically significant relationships were found between English proficiency and improvements in listening ($F=3.474$, $p=0.066>0.05$) and writing ($F=3.660$, $p=0.059>0.05$), which means language proficiency could not obviously influence the improvements in listening and writing skills through EMI courses.

5.2 Research question 2: Challenges in EMI courses

According to the questionnaire survey, the students in Chinese universities reported a variety of challenges that they were experiencing or had experienced in EMI courses, covering aspects such as language skills, course materials, teacher factors and culture. The challenges could be summed up in eight categories: 'lack of vocabulary', 'obscure teaching materials', 'stress in speaking and communication', 'difficulty of assignments', 'too fast teaching progress', 'boring course contents', 'cultural gap between Chinese and English', and the option 'other' including three valid answers, 'fair English proficiency of the teacher', 'easiness of feeling sleepy' and 'too simple teaching contents in view of cultural differences' (the invalid one was 'none' so it has

been excluded). The detailed results are shown below (see Figure 3):

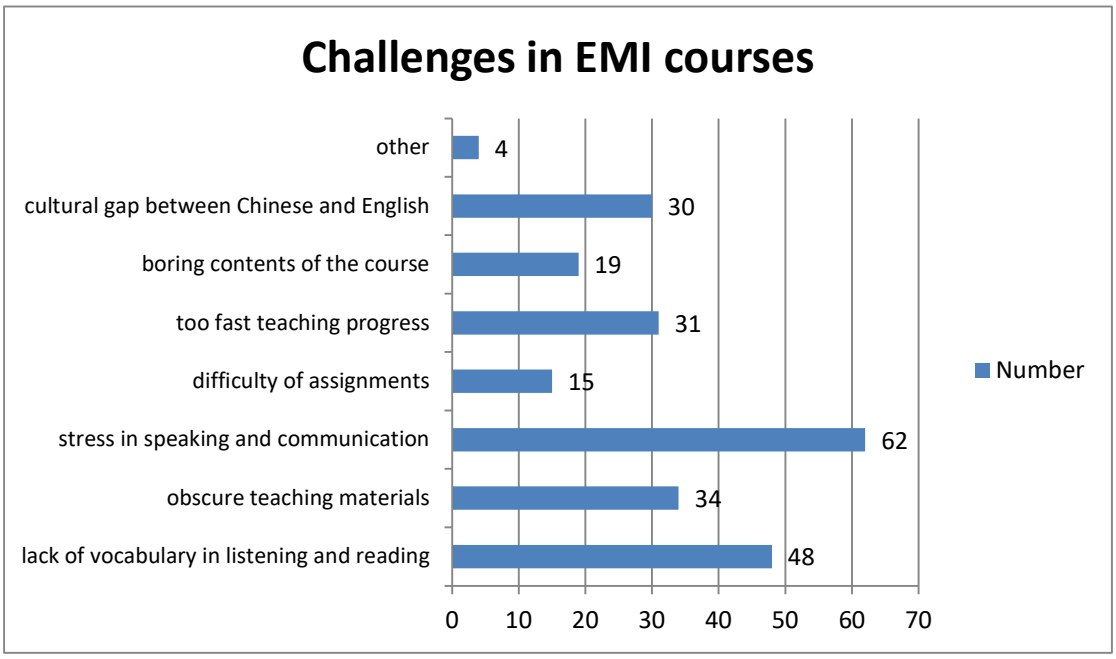

Figure 3. Students' problems emerging in EMI courses

In general, the participants believed that there existed more or less challenges in their learning. As is vividly depicted in the bar chart, the most challenge in EMI courses was the stress of speaking and communicating in English, accounting for 73.81% (N=62). On top of that, students' lack of vocabulary and obscure teaching materials respectively accounted for 57.14% (N=48) and 40.48% (N=34) which could made it difficult to read and understand the contents. Then, 31 participants (36.90%) held the view that the teaching progress was too fast and they could not keep up with the teacher. Another challenge which made up 35.71% (N=30) was the cultural gap between Chinese and English, possibly related to the mode, approach and materials of teaching. Besides, 19 participants (22.62%) thought the course contents were boring

and 15 (17.86%) had difficulty in completing the assignments.

The interview data also provided some evidence for the research question. S1 mentioned that 'sometimes I cannot simultaneously grasp what the teacher are saying when I am watching the PowerPoint slides, …because there are too much information to catch in these slides'. In other words, the student had difficulty in listening to the teacher and reading the materials effectively at the same time. Similarly, as S2 whose English proficiency level was a bit lower than the other participants' said, 'It is quite hard for me to understand all the contents in class, as I am not very good at English, especially listening and speaking skills. Thus, it takes time to translate the English sentences into my native language Chinese in my mind, and this often makes me miss a lot of important points.' Due to the lack of language proficiency, the student gained input through a relatively slow process of translation. A special challenge which S3 had noted was about interaction in class: 'in response to the COVID-19 pandemic, the online sessions of some courses were set up and available remotely for us, but I would say that they may restrict students' ability and needs of interaction.' The students believed that interaction depended more on face-to-face classroom activities than online ones. In addition, with respect to online teaching, S4 mentioned that 'other problems caused by network instability or software bugs could make the teaching less effective to a large extent'.

5.3 Research question 3: Interaction in different lectures

From the results of the questionnaire survey, the students' interaction with teacher and students differed in the two kinds of lectures in EMI courses, i.e. lectures given by NS teachers and local NNS teachers. The details are shown as follows (see Table 6):

	interaction (NS lecturers)	**interaction (local NNS lecturers)**
Valid	84	84
Mean	3.643	3.048
Std. Deviation	0.940	1.191
Minimum	1.000	1.000
Maximum	5.000	5.000
Sum	306.000	256.000

Table 6. Descriptive statistics of students' interaction in EMI lectures given by NS lecturers and local NNS lecturers

The table indicated the descriptions of the interaction in the lectures: interaction in NS lecturers' (Mean=3.643, SD=0.940) and in local NNS lecturers' (Mean=3.048, SD=1.191). This demonstrated that the participants had interaction with teacher and students in both of the lectures. In addition, the students appeared to have more interaction in lectures of native English speakers than those of local non-native English teachers in EMI courses.

The interviewees also provided some evidence of the interaction in different lectures. For one thing, they agreed that there were more interaction in NS lecturers' classroom because of the activities, materials and teaching styles. As S4 said, '…, the lively atmosphere in their lectures made the students more willing to interact with others'. S3 noted that 'native English teachers like to interact with us in many ways, such as asking questions, organizing group discussion and telling jokes.' For another, the students believed that NNS lecturers were more logical in teaching and have the accents easier to understand than NS lecturers, which may be good for their learning and in some cases they had much more interaction in NNS teachers' lectures. For instance, S1 mentioned that 'in local Chinese teachers' lectures, when students ask about particular concepts and meanings of words or sentences that are difficult to understand, sometimes the teacher may give more explanations to us and even explain in L1 after class.' Besides, according to S2's interview, '… some native English-speaking lecturers have tried to slow down their speeds, but I still feel a little bit fast and cannot hear clearly because of the liaison in their spoken English. In contrast, I am more adapted to Chinese teachers' speeds and accents. …, it is true that cultural differences between English and Chinese can influence the teaching in the two types of lectures.'

Aside from the above points of view, it was S3 who stated that 'the interaction in online sessions could not be as much as that in face-to-face classroom, neither in NS teachers' or NNS teachers' lectures'. The student thought that students were less

willing to interact with each other through network rather than in close distance. Furthermore, as S1 mentioned, '… a lot of students are reluctant to interact in class. You know, speaking in a foreign language is harder than in L1 for students whose English proficiency is not very high. Generally, in a discussion group of 4 to 8, those who are good at English speaking always play a dominant role in making reports.' This shows students' language proficiency and their fears of speaking English in front of other people can have influences on their interaction in EMI class.

5.4 Research question 4: Strategies used in learning

The questionnaire survey investigated students' use of learning strategies in EMI courses. The strategies were divided into five categories: organization, critical thinking, metacognitive self-regulation, peer learning and help seeking. Table 7 below shows the details of the data:

	organization	**critical thinking**	**metacognitive self-regulation**	**peer learning**	**help seeking**
Valid	84	84	84	84	84
Mean	7.119	6.845	6.690	7.571	7.179
Std. Deviation	1.916	1.766	1.749	1.593	1.831
Minimum	2.000	2.000	2.000	3.000	3.000
Maximum	10.000	10.000	10.000	10.000	10.000

	organization	critical thinking	metacognitive self-regulation	peer learning	help seeking
Sum	598.000	575.000	562.000	636.000	603.000

Table 7. Descriptive statistics of students' use of learning strategies in EMI courses

The table illustrated an overall description of the scores of the five categories: organization strategies (Mean=7.119, SD=1.916), critical thinking strategies (Mean=6.845, SD=1.766), metacognitive self-regulation strategies (Mean=6.690, SD=1.749), peer learning strategies (Mean=7.571, SD=1.593) and help seeking strategies (Mean=7.179, SD=1.831). This demonstrated that the students had used more or less these learning strategies in EMI courses. Among these items, the average score of peer learning strategies (7.571) was the highest while that of metacognitive self-regulation strategies (6.690) was the lowest, which means the students had attached importance to the use of peer learning strategies such as discussing with other students, while they had used much fewer metacognitive self-regulation strategies like setting goals and asking themselves questions in EMI courses. Besides, the average scores of the other items revealed more use of help seeking and organization strategies than that of critical thinking strategies.

According to the results of independent samples T-tests, among all the five types of

learning strategies in EMI courses, there existed gender differences in the participants' use of the following organization strategy: 'When I study the readings for this course, I outline the material to help me organize my thoughts.' The detailed information is presented below (see Table 8):

	t	df	p
[Organization] 'When I study the readings for this course, I outline the material to help me organize my thoughts.'	-2.190	82	0.031

Note. Student's t-test.

Table 8. Independent samples T-test of gender differences in students' use of learning strategies (one of the statements subordinate to 'organization' strategies) in EMI courses

From the table, all the gender samples showed a significance ($p<0.05$) related to the organization strategy. To be more specific, on the 0.05 significance level ($t=-2.190$, $p=0.031$), there existed a difference between male and female students in their use of this strategy. By contrast, the mean of male samples (2.951) was lower than that of females (3.512). The descriptive plot below displays the gender difference in the strategy (see Figure 4):

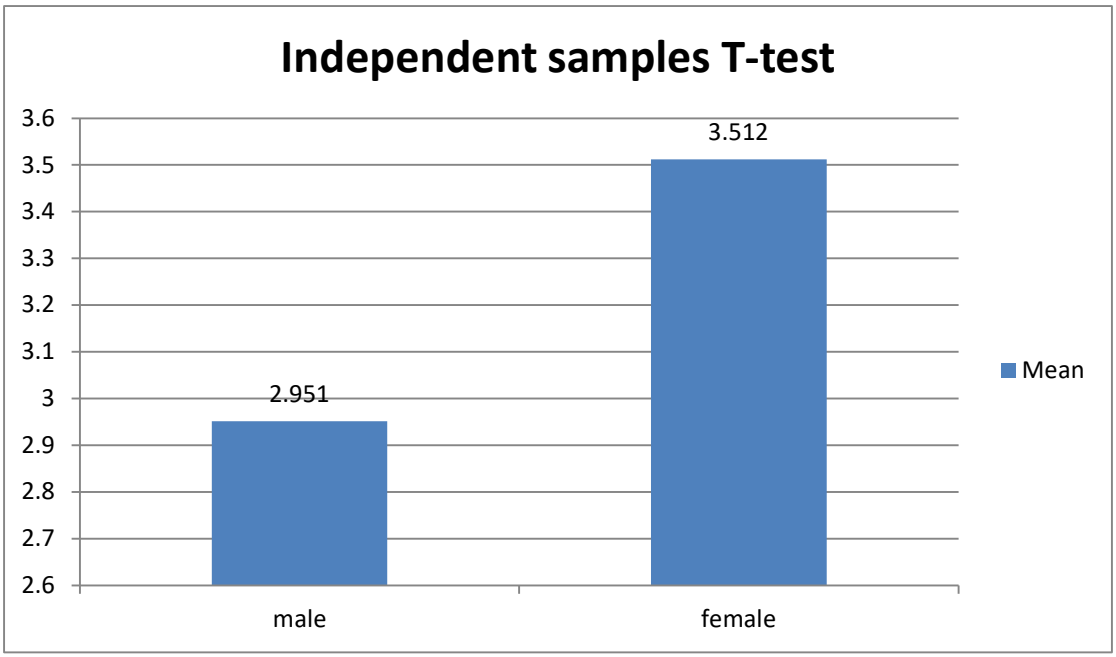

Figure 4. Descriptive plot of results of independent samples T-test for the organization strategy

6 Discussion

The results provided some practical implications for learning and teaching in EMI courses in Chinese higher education. Meanwhile, in spite of the evidence in the particular contexts shown in the study, further research for expansion in this field is still needed.

6.1 Implications

According to the findings, the effectiveness of EMI in Chinese universities may be affected by several factors. From the students' perceptions, a variety of specific pedagogies appropriate for the actual situations can be concluded in order to improve the quality of EMI courses from the perspectives of both learner and teacher variables.

6.1.1 Effective EMI classroom: learning outcomes and language proficiency

The study reveals that Chinese university students achieved certain learning outcomes in both content knowledge and language skills through EMI courses. Their reading and listening skills improved the most while the speaking skill was the least. This suggests the EMI classroom was not effective enough and still needed to be enhanced. The findings of the relationship between the students' English proficiency and their content and language improvements in Chinese EMI context support the previous study which suggested that the success in EMI courses was driven by increasing students' general English proficiency (Rose & McKinley, 2018; Rose et al., 2020). This study echoes similar results that English proficiency could influence the improvements in content knowledge, reading and speaking skills in EMI courses. Rose et al. (2020) note that compared with those with higher proficiency, students poor in English are at a disadvantage in learning outcomes of content knowledge. The quantitative and qualitative data of the study also show that lower-level proficient students were likely to encounter more obstacles and difficulties in their learning. Therefore, it is necessary to give students adequate language support in a systematical way in EMI courses to help them develop language skills and make the courses more effective (Rose & McKinley, 2018). For example, institutions can offer special language sessions or programmes which had better be closely linked to students' disciplines (Rose et al., 2020). Additionally, specific language thresholds were not found in the research although students' English level did affect their performances

and outcomes, which agrees with the previous study examining the relationship between English proficiency and academic language skills in Japanese EMI context (Aizawa et al., 2020). More language support should be provided for students with low English proficiency in Chinese EMI courses so as to improve their abilities to acquire content knowledge and language skills.

6.1.2 How to deal with challenges in EMI courses

Based on the questionnaires, Chinese university students were or had been faced with various challenges in EMI courses. To summarize, these challenges were mainly concerned with student and teacher factors, curriculums, cultures and learning environments. The results support and supplement the findings of Evans and Morrison's (2011) study on the challenges of English-medium higher education which has revealed four particular problems related to vocabulary, lectures, academic style and requirements, indicating that there may be a wider range of problems in EMI courses. Educators should figure out proper solutions to these problems. As one of the participants' answers to the open-ended question in the questionnaire survey regarding any other perceptions of EMI courses read, 'EMI is appropriate for teaching mathematics, physics and chemistry courses because many concepts and theories are explained more clearly in foreign textbooks and books. There can be some deficiencies in the Chinese version, such as translation mistakes and unclear meanings. I think EMI courses is helpful for students' academic development in the future. After all, the major language used in the frontier science research is still English.' It is

necessary for the editors to avoid translation mistakes in the textbooks used in EMI courses and make the teaching materials easier to understand. Another answer to this question mentioned that 'it would be better if the online sessions were recorded for playback, which was good for our reviewing what we had learned'. In order to deal with problems related to network as well as to improve students' learning experience, there is a need to record the sessions. When it comes to language challenges such as lack of vocabulary and stress in speaking, more supporting courses or programmes can be provided. From the angle of teacher factors, EMI lecturers may optimize their lesson plans to make the class more attractive, and slow down their pace in class checking students' understanding of the contents. Besides, they should assign tasks which are appropriate for learners, going from the easy to the difficult and complicated. Last but not least, students should be exposed to the knowledge and information of cultural differences between English and Chinese so that they could better adapt themselves to the models of teaching in EMI courses (Evans & Morrison, 2011).

6.1.3 The impacts of lecturers with different language backgrounds in class interaction

The questionnaire survey and interviews indicate students' perceptions of interaction in EMI class of lecturers with different language backgrounds. From their perspectives, generally they had more interaction in lectures given by NS teachers because of the lively classes. The results are in accord with Qiu and Fang's (2019)

study showing that Chinese university students could have adequate and efficient interaction in NS teachers' lectures than NNS teachers'. However, the study suggests that local NNS lecturers had their own advantages in teaching. That is, students were more adapted to NNS lecturers' class for their accents, teaching styles and methods. In some cases, students were more willing to interact with others in such class because they understood the contents more and felt less stressful about the cultural factors (Qiu & Fang, 2019). Hence, in order to increase students' interaction in EMI courses, NS and local NNS teachers should communicate to exchange their teaching experience and learn from each other (Yu et al., 2020). EMI lecturers need to design their lessons from learners' standpoints, making the class more suitable and effective for facilitating interaction. On top of that, some participants also shared other ideas of the interaction in EMI classroom. For example, one of their answers to the open-ended question in the questionnaire survey regarding any other perceptions of EMI courses said, 'In science and engineering courses for undergraduates, objectively most of the contents or questions have absolutely correct answers, which leaves little room for arguments. …, and for some students, English is a tool more for conveying information needed rather than for enhancing communication and interaction with others.' This reflects that teachers may provide more opportunities for students to interact with others and expand the space for arguing and critical thinking in EMI courses. Furthermore, the differences of interaction between online and face-to-face sessions should be taken into consideration.

6.1.4 Comprehensive and appropriate learning strategies

According to the results, university students would use a variety of learning strategies in Chinese EMI courses, including organization, critical thinking, metacognitive self-regulation, peer learning and help seeking strategies (Oxford, 1990). Their use of each strategy was not equal, which was embodied in more use of peer learning and help seeking strategies and less use of critical thinking and metacognitive self-regulation strategies. The findings are similar to the previous research on Turkish students' strategies used to deal with the difficulties in EMI courses (Soruç & Griffiths, 2018). It is suggested that students are supposed to be well aware of using the strategies appropriate to themselves, and teachers should give them the relevant, effective instruction of learning strategies (Tai & Tang, 2021). The interviewees mentioned some other strategies they used in the courses. For instance, as S1 said, 'I usually preview the materials in advance and refer to the dictionary when coming across new words. This is a good way for me to acquire the knowledge well. Also, I bought a digital tablet to take notes on and supplement what the teacher says in class; that is very convenient, I think.' The student applied the metacognitive strategies to improve the understanding of the contents. As to organization strategies, S3 noted, 'When I was in the sophomore year, there were a lot of points to remember and I would copy from the materials to consolidate the memories. If the materials were not well organized, I would do some mind maps to make them clearer and more logical.' All of the ideas about useful strategies can be passed on to other learners and help them accumulate more experience for practice (Soruç & Griffiths, 2018). In addition,

it is worth noting that the study showed a gender difference in use of the organization strategy in EMI courses. This indicates that individual factors may need to be considered when teachers give strategy instructions.

6.2 Limitations and directions for further study

Despite the findings regarding the EMI courses, it should be noted that there exist some limitations in this study which may have influences on the analysis and interpretation of the results. First of all, the research context was restricted to two universities in China, covering a small, particular range of majors (more of science and engineering backgrounds) such as Biomedical Science, Information and Computing Science, and Electrical Engineering. The findings and implications might not be applicable to students of other backgrounds or contexts. Besides, the research did not divide the undergraduates and postgraduates into groups, and they were investigated as a whole. Different groups may not have the same experiences and ideas of the EMI courses. Second, in terms of research methods, the questionnaire items to explore the students' perceptions was not that detailed and comprehensive. Also, the online questionnaire survey method has its inherent drawbacks that would affect the results (Wilson & Dewaele, 2010). Although the semi-structured interviews could be a supplement to the questionnaire data, the number of interviewees was relatively small, which may lead to unconvincing points. Third, some of the data, such as the students' English proficiency and their improvements in EMI courses, were collected according to the participants' self-perceptions, and sometimes they might

overrate or underrate the levels of their performance or experiences (Aizawa et al., 2020). Thus, the accuracy of the findings could be reduced by such factors.

As to the directions for further study, it is suggested that research settings could be in wider contexts, and participants from other departments or backgrounds could be enrolled in EMI studies. It would be better to investigate relevant issues respectively from undergraduate and postgraduate levels (Dearden & Macaro, 2016). In addition, when it comes to methodology, reliability of data can be increased by applying some other methods, such as classroom observation and stimulated recall sessions (Rose et al., 2020). With regard to questionnaire survey and interview, more detailed items could be added in order to have a deeper understanding of perceptions of EMI courses. Some factors or objects of study, such as learning outcomes and language proficiency, may be reflected more exactly by test scores or long-term records instead of brief self-assessments. Last but not least, future studies may focus on social and cultural influences in EMI, especially in non-English-speaking countries or areas (Macaro et al., 2018). There probably exist cultural gaps and intrinsic rules in EMI class of different contexts which need further exploration.

7 Conclusion

The study investigated Chinese university students' perceptions and experiences of EMI courses, contributing to research on learning and pedagogies in EMI contexts. According to the results, students had content and language improvements which may

be affected by English proficiency. That is, their English proficiency could have positive impacts on the acquisitions of content knowledge, reading and speaking skills. The questionnaire survey provided more evidence that students encountered a variety of challenges in EMI courses (Evans & Morrison, 2011), related to the factors ranging from language abilities, curriculum, teachers to culture. Besides, the qualitative and quantitative data suggested that students' interaction may differ in the lectures given by teachers with NS/NNS backgrounds, which support Qiu and Fang's (2019) study on university students' perspectives of the two kinds of lecturers. In addition, similar to the previous research, the study indicated that Chinese students would use different strategies to help their learning, including organization, critical thinking, metacognitive self-regulation, peer learning and help seeking strategies (Soruç & Griffiths, 2018).

To sum up, in order to enhance the effectiveness of EMI courses in Chinese context, it is necessary for educators and learners to pay attention to the above factors and make prompt adjustments based on the actual situation. From the research, we could see positive effects of Chinese EMI courses that will be valuable for English learning. Some suggestions in terms of the deficiencies in the courses drawn from the findings are also provided in this paper for reference. In view of the limitations of this study, more research on EMI courses in other contexts needs to be conducted which explores influencing factors from different angles. Thus, we can have a firmer grasp of EMI and create an effective and reasonable classroom that is more appropriate for learners.

References

Adamson, B. 2004. *China's English: A History of English in Chinese Education*. Hong Kong University Press.

Aguilar, M. 2017. Engineering lecturers' views on CLIL and EMI. *International Journal of Bilingual Education and Bilingualism*, 20(6), 722–735.

Aguilar, M., & Muñoz, C. 2014. The effect of proficiency on CLIL benefits in Engineering students in Spain. *International Journal of Applied Linguistics*, 24, 1–18.

Aizawa, I., Rose, H., Thompson, G., & Curle, S. 2020. Beyond the threshold: Exploring English language proficiency, linguistic challenges, and academic language skills of Japanese students in an English medium instruction programme. *Language Teaching Research: LTR*. https://doi.org/10.1177/1362168820965510

Ali, H. I. H. 2020. Lecture comprehension difficulties experienced by Omani students in an English-medium engineering programme. *Cogent Arts & Humanities*, 7(1), 1741986.

An, J., & Thomas, N. 2021. Students' beliefs about the role of interaction for science learning and language learning in EMI science classes: Evidence from high schools in China. *Linguistics and Education*, 65.

Baetens Beardsmore, H. 1993. *European models of bilingual education*. Multilingual Matters.

Baker, C., & Wright, W. E. 2017. *Foundations of bilingual education and bilingualism (6th edition.)*. Multilingual Matters.

Bandura, A. 1997. *Self Efficacy: The Exercise of Control*. New York: W.H Freeman and Company.

Bamgboe, A. 2001. World Englishes and globalization. *World Englishes*, 20(3), 357–363.

Barcelos, A. M. F. 2015. Unveiling the relationship between language learning beliefs, emotions, and identities. *Studies in Second Language Learning and Teaching*, 5(2), 301–325.

Bolton, K. 2003. *Chinese Englishes: A sociolinguistic history*. Cambridge University

Press, Cambridge.

Bolton, K., & Botha, W. 2015. English in China's universities: Past and present. *World Englishes*, 34(2), 190-210.

Bradford, A. 2013. English-medium degree programs in Japanese universities: Learning from the European experience. *Asian Education and Development Studies*, 2(3), 225-240.

Chamot, A. U., & Kupper, L. 1989. Learning Strategies in Foreign Language Instruction. *Foreign Language Annals*, 22, 13-22.

Chin, C. & Osborne, J. 2010. Students' questions and discursive interaction: Their impact on argumentation during collaborative group discussions in science. *J. Res. Sci. Teach.*, 47, 883-908.

Chung, R. H., Kim, B. S., & Abreu, J. M. 2004. Asian American Multidimensional Acculturation Scale: Development, Factor Analysis, Reliability, and Validity. *Cultural Diversity & Ethnic Minority Psychology*, 10(1), 66–80.

Council of Europe. 2011. *Common European framework of reference for languages: Learning, teaching, assessment*. Strasbourg: Council of Europe.

Creswell, J. W. 2015. *A concise introduction to mixed methods research*. SAGE.

Creswell, J. W., & Clark, V. L. P. 2017. *Designing and Conducting Mixed Methods Research*. Thousand Oaks, CA: SAGE Publications.

Curle, S., Yuksel, D., Soruç, A., & Altay, M. 2020. Predictors of English Medium Instruction academic success: English proficiency versus first language medium. *System (Linköping)*, 95.

Dafouz, E., & Smit, U. 2016. Towards a Dynamic Conceptual Framework for English-Medium Education in Multilingual University Settings. *Applied Linguistics*, 37(3), 397–415.

Dearden J. 2018. The Changing Roles of EMI Academics and English Language Specialists. In Kırkgöz Y., & Dikilitaş K. (Eds.), *Key Issues in English for Specific Purposes in Higher Education*. Springer, Cham, 323–338.

Dearden, J., & Macaro, E. 2016. Higher Education Teachers' Attitudes towards English Medium Instruction: A Three-Country Comparison. *Studies in Second*

Language Learning and Teaching, 6(3), 455–486.

Doiz, A., Lasagabaster, D., & Sierra, J. M. 2011. Internationalisation, multilingualism and English-medium instruction. *World Englishes*, 30(3), 345–359.

Doiz, A., Lasagabaster, D., & Sierra, J. M. 2012. *English-medium instruction at universities: global challenges*. Multilingual Matters.

Du, H., & Guan, H. 2016. Hindrances to the new teaching goals of College English in China: Being contextually blind and linguistically groundless, current tertiary ELT policy needs to be redefined. *English Today*, 32(1), 12–17.

Duncan, T. G., & McKeachie, W. J. 2005. The Making of the Motivated Strategies for Learning Questionnaire. *Educational Psychologist*, 40(2), 117–128.

Eisinga, R. N., Te Grotenhuis, H. F.., & Pelzer, B. J. 2013. The reliability of a two-item scale: Pearson, Cronbach or Spearman-Brown? *International Journal of Public Health*, 58(4), 637–642.

Ekoç, A. 2020. English Medium Instruction (EMI) from the perspectives of students at a technical university in Turkey. *Journal of Further and Higher Education*, 44(2), 231–243.

Evans, S., & Morrison, B. 2011. Meeting the challenges of English-medium higher education: The first-year experience in Hong Kong. *English for Specific Purposes (New York, N.Y.)*, 30(3), 198–208.

Fenton-Smith, B., Humphreys, P., & Walkinshaw, I. 2017. *English Medium Instruction in Higher Education in Asia-Pacific: From Policy to Pedagogy*. Springer International Publishing AG.

Galloway, N. 2017. *Global Englishes and change in English language teaching: attitudes and impact*. Routledge, an imprint of the Taylor & Francis Group.

Galloway, N., & Ruegg, R. 2020.The provision of student support on English Medium Instruction programmes in Japan and China. *Journal of English for Academic Purposes*, 45, 100846.

Gao, X., & Wang, W. 2017. Bilingual education in the People's Republic of China. In García, O., & Lin, A. (Eds.), *Encyclopedia of language and education: Bilingual and multilingual education*. Springer, New York, 219-231.

García, O., & Baetens Beardsmore, H. 2009. *Bilingual education in the 21st century: a global perspective*. Wiley-Blackwell.

Ghonsooly, B., & Loghmani, Z. 2012. The relationship between EFL learners' reading anxiety levels and their metacognitive reading strategy use. *International Journal of Linguistics*, 4(3), 326.

Gibbs, G. R. 2007. *Analyzing qualitative data*. SAGE Publications, Ltd.

Gil, J., & Adamson, B. 2011. The English language in Mainland China: A sociolinguistic profile. In Feng, A. (Ed.), *English language education across Greater China*. Multilingual Matters, Bristol, 23-45.

Graham, K.M., Choi, Y., Davoodi, A., Razmeh, S., & Dixon, L.Q. 2018. Language and content outcomes of CLIL and EMI: A systematic review. *LACLIL*, 11(1), 19–37.

Griffiths, C. 2008. Strategies and good language learners. In Griffiths, C. (Ed.), *Lessons from Good Language Learners*. Cambridge: Cambridge University Press. 83-98.

Griffiths, C. 2015. What have we learnt from 'good language learners'? *ELT Journal*, 69(4), 425–433.

Guarda, M., & Helm, F. 2017. 'I have discovered new teaching pathways': the link between language shift and teaching practice. *International Journal of Bilingual Education and Bilingualism*, 20:7, 897–913.

Hu, G., & Lei, J. 2014. English-medium instruction in Chinese higher education: a case study. *Higher Education*, 67, 551–567.

Hu, G., Li, L. & Lei, J. 2014. English-medium instruction at a Chinese University: rhetoric and reality. *Language Policy*, 13, 21–40.

Hu, J., & Wu, P. 2020. Understanding English language learning in tertiary English-medium instruction contexts in China. *System*, 93, 102305.

Inbar-Lourie, O., & Donitsa-Schmidt, S. 2020. EMI Lecturers in international universities: is a native/non-native English-speaking background relevant? *International Journal of Bilingual Education and Bilingualism*, 23(3), 301–313.

Jenks, C. J., & Seedhouse, P. 2015. *International perspectives on ELT classroom interaction*. Palgrave Macmillan.

Jiang, A. L., & Zhang, L. J. 2019. Chinese students' perceptions of English learning affordances and their agency in an English-medium instruction classroom context. *Language and Education*, 33(4), 322–339.

Jiang, A. L., Zhang, L. J., & May, S. 2019. Implementing English-medium instruction (EMI) in China: teachers' practices and perceptions, and students' learning motivation and needs. *International Journal of Bilingual Education and Bilingualism*, 22(2), 107–119.

Joe, Y., & Lee, H. 2013. Does English-Medium Instruction Benefit Students in EFL Contexts? A Case Study of Medical Students in Korea. *The Asia-Pacific Education Researcher*, 22, 201–207.

Karakas, A. 2017. Teacher Preferences in Content and Language-Focused Courses in Higher Education: The Case of Turkish EMI Students. *Journal of Language Teaching and Learning (Ankara, Turkey)*, 7(2), 127.

Kim, E. 2002. Voices of learners from English-medium lecture. *Korean Journal of Applied Linguistics*, 18(2), 145–163.

Kim, E., Kweon, S., & Kim, J. 2017. Korean engineering students' perceptions of English-medium instruction (EMI) and L1 use in EMI classes. *Journal of Multilingual and Multicultural Development*, 38(2), 130–145.

Kim, J., Tatar, B., & Choi, J. 2014. Emerging culture of English-medium instruction in Korea: experiences of Korean and international students. *Language and Intercultural Communication*, 14(4), 441–459.

Kirkgoz, Y. 2009. Students' and lecturers' perceptions of the effectiveness of foreign language instruction in an English-medium university in Turkey. *Teaching in Higher Education*, 14(1), 81–93.

Kirkpatrick, R., & Zang, Y. 2011. The Negative Influences of Exam-Oriented Education on Chinese High School Students: Backwash from Classroom to Child. *Language Testing in Asia*, 1(3), 1–10.

Klaassen, R. G., & De Graaff, E. 2001. Facing Innovation: Preparing Lecturers for English-Medium Instruction in a Non-Native Context. *European Journal of Engineering Education*, 26 (3), 281–289.

Kong, M., & Wei, R. 2019. EFL learners' attitudes toward English-medium instruction in China: The influence of sociobiographical variables. *Linguistics and Education*, 52, 44–51.

Lam, A. 2005. *Language eucation in China: Policy and experience from 1949*. Hong Kong University Press, Hong Kong.

Lee, J. S., Xie, Q., & Lee, K. 2021. Informal digital learning of English and L2 willingness to communicate: roles of emotions, gender, and educational stage. *Journal of Multilingual and Multicultural Development*.

Lee, K., & Lee, H. 2018. Korean graduate students' self-perceptions of English skills and needs in an English-medium instruction context. *Journal of Multilingual and Multicultural Development*, 39(8), 715–728

Lei, J., & Hu, G. 2014. Is English-medium instruction effective in improving Chinese undergraduate students' English competence? *International Review of Applied Linguistics in Language Teaching*, 52, 99–126.

Li, M. 2018. The effectiveness of a bilingual education program at a Chinese university: a case study of social science majors. *International Journal of Bilingual Education and Bilingualism*, 21(8), 897–912.

Li, C., & Ruan, Z. 2015. Changes in beliefs about language learning among Chinese EAP learners in an EMI context in Mainland China: A socio-cultural perspective. *System*, 55, 43-52.

Liu, C. 2013. From language learners to language users: A Study of Chinese Students in the UK. *International Journal of Applied Linguistics*, 23, 123-143.

Liu, H. J. 2013. Effects of foreign language anxiety and perceived competence on learning strategy use. *International Journal of English Linguistics*, 3(3), 76–87.

Ma, Y., Yu, S., Reynolds, B. L., & Jiang, L. 2021. A Qualitative Investigation of Chinese Students' Willingness to Communicate in English in the Graduate School EMI Classroom. *English Teaching & Learning*. https://doi.org/10.1007/s42321-021-00087-1

Macaro, E. 2018. *English medium instruction: content and language in policy and practice*. Oxford University Press.

Macaro, E., & Akincioglu, M. 2018. Turkish university students' perceptions about English Medium Instruction: exploring year group, gender and university type as variables. *Journal of Multilingual and Multicultural Development*, 39(3), 256–270.

Macaro, E., Curle, S., Pun, J., An, J., & Dearden, J. 2018. A systematic review of English medium instruction in higher education. *Language Teaching*, 51 (1), 36-76.

Macaro, E., & Han, S. 2020. English medium instruction in China's higher education: teachers' perspectives of competencies, certification and professional development. *Journal of Multilingual and Multicultural Development*, 41(3), 219–231.

MacIntyre, P. D., Dörnyei, Z., Clément, R., & Noels, K. A. 1998. Conceptualizing willingness to communicate in a L2: a situational model of L2 confidence and affiliation. *The Modern Language Journal*, 82(4), 545–562.

Ministry of Education. 2001. *Guidelines for strengthening college undergraduate programs and enhancing the quality of instruction*. [Online]. Ministry of Education of the People's Republic of China. [Accessed 26 August 2021]. Available from: http://www.moe.gov.cn/jyb_sjzl/moe_364/moe_302/moe_309/tnull_4682.html

Ministry of Education and Ministry of Finance. 2010. *Circular on the approval of the bilingual education demonstration courses for the academic year of 2010*. [Online]. Ministry of Education and Ministry of Finance of the People's Republic of China. [Accessed 26 August 2021]. Available from: http://www.moe.gov.cn/srcsite/A08/s7056/201007/t20100726_93899.html

Oxford, R. L. 1990. *Language learning strategies: what every teacher should know*. Heinle.

Oxford, R. L. 1996. Employing a Questionnaire to Assess the Use of Language Learning Strategies. *Applied Language Learning*, 7(1), 25–46.

Oxford, R. L., & Burry-Stock, J. A. 1995. Assessing the use of language learning strategies worldwide with the ESL/EFL version of the Strategy Inventory for Language Learning (SILL). *System*, 23(1), 1–23.

Oxford, R. L., & Nyikos, M. 1989. Variables Affecting Choice of Language Learning Strategies by University Students. *The Modern Language Journal*, 73, 291–300.

Pintrich, P. R. 1991. *A Manual for the Use of the Motivated Strategies for Learning*

Questionnaire (MSLQ).

Pokay, P., & Blumenfeld, P. C. 1990. Predicting achievement early and late in the semester: The role of motivation and use of learning strategies. *Journal of educational psychology*, 82(1), 41.

Qiu, X., & Fang, C. 2019. Creating an effective English-Medium Instruction (EMI) classroom: Chinese undergraduate students' perceptions of native and non-native English-speaking content teachers and their experiences. *International Journal of Bilingual Education and Bilingualism*, 1–15.

Rao, Z., & Yuan, H. 2016. Employing native-English-speaking teachers in China: Benefits, problems and solutions: Providing native-English-speaking teachers with a local pre-service training program and adopting a team teaching approach are essential for enhancing their efficiency in the Chinese EFL context. *English Today*, 32(4), 12–18.

Rowland, L., & Murray, N. 2020. Finding their feet: lecturers' and students' perceptions of English as a medium of instruction in a recently-implemented Master's programme at an Italian university. *Journal of Multilingual and Multicultural Development*, 41(3), 232–245.

Rose, H., & McKinley, J. 2018. Japan's English-Medium Instruction Initiatives and the Globalization of Higher Education. *Higher Education*, 73(1): 111–129.

Rose, H., Curle, S., Aizawa, I., & Thompson, G. 2020. What drives success in English medium taught courses? The interplay between language proficiency, academic skills, and motivation. *Studies in Higher Education (Dorchester-on-Thames)*, 45(11), 2149–2161.

Rose, H., McKinley, J., & Baffoe-Djan, J. B. 2020. *Data collection research methods in applied linguistics*. Bloomsbury Academic.

Sang, Y., & Hiver, P. 2021. Using a language socialization framework to explore Chinese Students' L2 Reticence in English language learning. *Linguistics and Education*, 61.

Serrano, S. L. 2010. Learning languages in study abroad and at home contexts: a critical review of comparative studies. *Porta Linguarum*, 13: 149–163.

Soruç, A., & Griffiths, C. 2018. English as a medium of instruction: students' strategies. *ELT Journal*, 72(1), 38–48.

Stryker, S., & Leaver, B. 1997. *Content-based instruction in foreign language education: Models and methods*. Washington, DC: Georgetown University Press.

Sultana, S. 2014. English as a medium of instruction in Bangladesh's higher education: Empowering or disadvantaging students? *Asian EFL Journal*, 16, 11–52.

Sun, Y., Wang, Y., & Liu, J. 2015. Case study of Chinese college students' attitudes toward only English-medium teaching in EFL classrooms. *Advances in Language and Literary Studies*, 6(2), 174–186.

Swain, M., & Johnson, R. 1997. Immersion education: A category within bilingual education. In Johnson, R., & Swain, M. (Eds.), *Immersion Education: International Perspectives*. Cambridge: Cambridge University Press. 1–16.

Swanwick, R., & Gregory, S. 2007. *Sign bilingual education: policy and practice*. Douglas McLean.

Tai, T., & Tang, C. W. 2021. The role of graduate students' learning strategies in reducing their English medium instruction avoidance: the mediation effect of language anxiety. *Asia Pacific Journal of Education*, 41(2), 368–384.

Tashakkori, A., & Teddlie, C. 2016. *SAGE handbook of mixed methods in social & behavioral research (Second edition.)*. SAGE.

Tatzl, D. 2011. English-medium masters' programmes at an Austrian university of applied sciences: Attitudes, experiences and challenges. *Journal of English for Academic Purposes*, 10, 252–270.

Thompson, G., Aizawa, I., Curle, S., & Rose, H. 2019. Exploring the role of self-efficacy beliefs and learner success in English medium instruction. *International Journal of Bilingual Education and Bilingualism*. https://doi.org/10.1080/13670050.2019.1651819

Wei, R., & Feng, J. 2015. Implementing CLIL for young learners in an EFL context beyond Europe. *English Today*, 31(1), 55-60.

Wei, R. 2013. Chinese-English bilingual education in China: Model, momentum, and driving forces. *Asian EFL Journal*, 15(4), 184-200.

Wei, R., & Su, J. 2012. The statistics of English in China. *English Today*, 28(3), 10-14.

Wei, R., & Su, J. 2015. Surveying the English language across China. *World Englishes*, 34(2), 175-189.

Werther, C., Denver, L., Jensen, C., & Mees, I. M. 2014. Using English as a medium of instruction at university level in Denmark: the lecturer's perspective. *Journal of Multilingual and Multicultural Development*, 35(5), 443–462.

Wesche, M., & Skehan, P. 2002. Communicative, task-based, and content-based language instruction. In Grabe, W., Swain, M., & Tucker R. (Eds.), *The Oxford handbook of applied linguistics*. Oxford: Oxford University Press. 207–228.

Wilson, R., & Dewaele, J. M. 2010. The use of web questionnaires in second language acquisition and bilingualism research. *Second Language Research*, 26(1), 103–123.

Xie, Q. 2017. Investigating the target language usage in and outside business English classrooms for non-English major undergraduates at a Chinese university. *Cogent Education*, 4(1), 1415629.

Xie, W., & Curle, S. 2019. Success in English medium instruction in China: Significant indicators and implications. *International Journal of Bilingual Education and Bilingualism*. https://doi.org/10.1080/13670050.2019.1703898

Xiong, W. 2019. A survey of the inadequacies of oral English teaching in developing areas of Zhejiang Province. *Theory and Practice in Language Studies*, 9(10), 1342–1349.

Yang, X. 2017. Balance of Content and Language in English-Medium Instruction Classroom. In Zhao, J & Dixon, L. Q. (Eds.), *English-Medium Instruction in Chinese Universities*. London: Routledge, 23–44.

Yip, D., Coyle, D., & Tsang, W. 2007. Evaluation of the effects of the medium of instruction on science learning of Hong Kong secondary students: Instructional activities in science lessons. *Education Journal*, 35(2), 77–107.

Yu, S., Wang, Y., Jiang, L., & Wang, B. 2020. Coping with EMI (English as a medium of instruction): Mainland China students' strategies at a university in Macau.

Innovations in Education and Teaching International, 1–11.

Zhang, M., & Pladevall-Ballester, E. 2021. Discipline-specific language learning outcomes in EMI programs in the People's Republic of China. *Language and Education*, 35(4), 357–374.

Zhao, J., & Dixon, L. Q. 2018. *English-medium instruction in Chinese universities: perspectives, discourse and evaluation*. London: Routledge.

Appendices

Appendix 1: The interview protocol

1. Can you give some basic information of the EMI courses, such as duration of each session, types of lesson, class size, …?

2. Do you have any obvious problems that you feel are difficult to deal with and may affect the quality of your lectures or something else?

3. What are your EMI teachers composed of, native English-speaking lecturers, non-native English-speaking lecturers, or both?

4. How do you feel about the teaching styles of lecturers with different language backgrounds?

5. How about the students' interaction and the atmosphere in the two types of lectures? What activities do they do in class, such as speech, debate, role play or something else?

6. How do you feel about the materials? What will you do if the contents are difficult to understand?

7. What unique strategies have you adopted to help improve the quality of your learning?

8. Do you have any other suggestions or comments about Chinese EMI courses?

We have excluded the participant consent forms and the dissertation proposal form because they identify the student and their university.