



## English as a Medium of Instruction: A Case Study at a Gifted High School in Vietnam

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This paper aims to examine the perceptions of teachers and students at a gifted high school in Central Vietnam about teaching science subjects such as Maths, Chemistry, Physics, and Biology through English. Using questionnaires, in-depth interviews, and class observations as research instruments, this study also explores the challenges the administrators, teachers, and students are facing in adopting English as a medium of instruction (EMI). The findings revealed that leaders, teachers, and students appreciate the project and show interest in EMI, but that its implementation experiences a lot of dilemmas and tensions partly owing to English competence, pedagogical methods, materials, and management. From these findings, the study suggests some implications to help make EMI implementation more applicable and effective at the high school level.

**Keywords:** English as a medium of instruction, high school, school subjects, perception, reflection

### Introduction

English has become one of the important keys to the regional and global integration and the development of Vietnam (MOET, 2013). In educational circles, the debate about the importance of English, and learning other subjects through English, continues gathering momentum. Ministries of education of many countries are perpetually revising policies, anticipating prime learning chances for learners to succeed in an increasingly demanding world that, especially regarding language education, requires English (British Council, 2010; Nguyen & White, 2011). Accordingly, teaching and learning English in Vietnam has been receiving special attention (K. W. Lee et al., 2016).

According to a survey conducted by the British Council in 2014, Vietnam is one of the countries trending in its use of English as a medium of instruction (EMI) in all stages of education, including primary, secondary, and tertiary (Dearden, 2015). Since the 2011-2012 academic year, MOET has decided to adopt EMI for natural science subjects at some particular schools as one component of the NFL 2020 project in order to ensure that Vietnamese students are able to keep abreast of scientific and technological development that is mostly published in English and to provide opportunities for students to use English and increase their proficiency in the language (MOET, 2013). MOET believes that despite a series of difficulties, it is time to start its plan on teaching science subjects in English, such as mathematics, physics, chemistry, biology, and informatics, at several high schools for the gifted

nationwide (Thanh Mai, 2014). Until now, EMI has been implemented at about 20 high schools for the gifted nationwide, with one or two lessons a week for every science subject, and this initial step has made a positive change in innovating the education provided at these schools (Hai Binh, 2013).

This research study attempts to explore how teachers and students at one school perceive the project to teach science subjects through English. This study also aims to find out the challenges they are faced with in the project application. From the findings of the study, some implications will be drawn out to help make the implementation of EMI at the school more applicable and effective. In terms of the research significance, EMI is considered to become an inevitable trend and a critical step for non-English speaking countries to internationalize their education in the global era (Chang, 2010; Chen, 2014; Morgado & Coelho, 2013). Both students and teachers in EMI projects are motivated to be proficient in both English and academic content, constituting a competitive advantage for students when entering domestic or international universities, laying a steady foundation for students' futures in the job market and in global integration (D. M. Le, 2012).

## Literature Review

### Definition of EMI

Prah (2005) defines a language of instruction as the language in which basic skills and knowledge are distributed to the population and the medium in which the production and reproduction of knowledge occur. Accordingly, a medium of instruction is supposed to be a tool enabling the teaching and learning process, facilitating the learning of subject content and helping students react to different facts and viewpoints in order to construct a new view of the world, including the meanings they attribute to the new concepts they are introduced to and the values they attach to them. Prah also confirms that for communication to be effective in teaching and learning, a medium of instruction should be the one which is familiar to the teacher and the learner. Therefore, it is not surprising that first language is often chosen as the medium of instruction at all levels in much of the world (Duc Manh Le, 2012; Nguyen, 2008).

Dearden (2015) defines EMI as “the use of the English language to teach academic subjects in countries or jurisdictions where the first language (L1) of the majority of the population is not English” (p. 2). This definition is significant because it provides a conceptual separation between EMI and content and language integrated learning (CLIL). As Coyle, Hood, and Marsh (2010) define it:

CLIL is a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language. That is, in the teaching and learning process, there is a focus not only on content, and not only on language. Each is interwoven, even if the emphasis is greater on one or the other at a given time. (p. 1)

As can be seen from the two definitions above, there are distinctions between CLIL and EMI. CLIL does not mention which additional language academic subjects are to be studied in; meanwhile, EMI makes it quite clear that the language of education used in teaching is English, regardless of geographical, political, social, or cultural backgrounds. Whereas CLIL has a clear objective of furthering both content and language at the same time, EMI focuses on using English as a bridge to the contents of the academic subject (Dearden, 2015). Moreover, whereas CLIL is contextually situated, EMI has no specific contextual origin.

### EMI in Asian Countries

The use of EMI across the world has drawn the attention of language policy and planning scholars and researchers in many countries. Asia is no exception. At the turn of the 21<sup>st</sup> century, a number of British,

American, and Australian universities established bilateral relationships with universities in Asia and elsewhere to moderate and co-teach EMI projects in a range of disciplines. The educational authorities in the Asian countries considered this trend an opportunity to develop autonomous EMI projects of their own. The main objectives are to create a new generation of students who are scientifically and technologically knowledgeable and fluent in English. They, therefore, become a workforce capable of continued learning, contributing to the economic growth and development of the countries (Kirkpatrick, 2014).

In Malaysia, the government allow and encourage an increasing number of private universities to introduce EMI in science and related subjects (Tham & Kam, 2008). In 1991, the project titled Vision 2020 was carried out with an aim to transform Malaysia into an international education hub. However, initially, this implementation was not successful because of nationalism. Malaysia is a multi-racial country with diverse groups (Malays, 50.4%; Chinese, 24.6%; Indians, 7.1%; and others). Therefore, some people insisted on Bahasa Malaysia becoming the language of science and technology. However, after the Asian financial crisis along with the establishment of private higher-learning institutions, the status of English has been more and more elevated. The Education Act has allowed universities to apply EMI in all levels, mainly in maths and science subjects (Mohini, 2008).

Hong Kong has a unique political complexion. Before 1998, English had a high social status; as a consequence, EMI was applied in over 90% of the secondary schools. However, after the handover from Britain to China, a mother tongue policy was implemented in 1998, in which EMI remained around 25% of the schools. A decade after 1998, EMI was used in 30% of the secondary schools (from Grade 7) in all subjects except Chinese History, Chinese Language, and Literature. Nowadays, with the trend to increase EMI whilst preserving mother tongue teaching, 65% of the secondary schools in Hong Kong are using EMI in at least one academic subject. However, students are tested prior to being accepted in these schools (Tung, Lam, & Tsang, 1997).

In Korea, the 'Immersion Programme' was launched to apply EMI in mathematics, science, music, social science, and physical education, but mostly in primary schools. Consequently, a series of textbooks was designed appropriately to the students' levels. However, this programme was halted in 2008, shortly after its introduction because of parental opposition. Nowadays, EMI remains in some private secondary schools and a small number of highly selective government schools. Because of the quite low level of Korean teachers' proficiency in English, both Korean and native speaker teachers are responsible for the implementation of this programme (Kim, 2014; Kym & Kym, 2014; W. Lee, 2010).

In Indonesia, 'The International Standard Schools' scheme was initiated in 2003 to use EMI in maths and science subjects from Year 4 of primary school and throughout junior, senior, and vocational secondary schools. By the end of 2009, approximately 190 international standard schools at the primary level and about 700 international standard junior, senior, and vocational secondary schools had implemented this scheme. However, there have been very few native speaker teachers for these subjects and more than half of the teachers acquire the lowest competency band in English proficiency level (Hadisantosa, 2010).

## **EMI Implementation in Vietnam**

In Vietnam, with the background of global integration, technological advances, and internationalization, the government has officially launched a pilot project as a component of the NFL 2020 project with the view to encouraging scientific and technological development, offering learners opportunities to increase their English proficiency, to grasp specialised terminology in English, to read a wide source of materials, to improve self-study skills, and to apply for international study abroad. At the tertiary level, EMI was adopted many years ago in some public and private universities and in some advanced training courses (To, 2010). At the secondary level, this project has been in pilot in about 20 gifted schools since 2013, with one to two lessons per week in maths and science subjects. At the primary level, only international

private schools are eager to implement this policy, mainly in science subjects. Teachers participating in this project are mainly content ones who are good at English (Thanh Mai, 2014).

Dearden (2015) found that many teachers, parents, and students in Vietnam consider EMI as a passport to global academic and business communities. University administrators tend to regard EMI as an opportunity to recruit high fee-paying international students and to increase global rankings. EMI is also seen as a key to success and a way to open doors. Policy makers regard EMI as a way to internationalise their education on offer, initiating opportunities for students to participate a global world.

Vu and Burns (2014) also point out that implementing EMI helps to assist learners to acquire the target language (i.e., English) while learning content. Coleman (2006) emphasizes that the main factors impelling the projects to adopt EMI are the internationalization of higher education due to the rise in the number of student exchanges, the competitiveness among graduates on the job market, the availability of relevant up-to-date teaching materials in English, the mobility of staff, and the preparation of students for an academic and professional world dominated by English.

Previous studies also point out several issues in implementing EMI in Vietnam. To (2010) points out some obstacles to the implementation of EMI in Vietnam such as insufficient consideration of project finance, facilities, equipment, managers, teacher quality, and the English and the Vietnamese proficiency levels of the learners. Le (2012) addresses some problems with EMI in higher education institutions. Examinations of English language competency in Vietnam show that students and lecturers have generally low English proficiency, meaning that students would be unable to comprehend lectures or materials in English. Considering lecturers, few have the proficiency to verbally communicate in English. Lecturers who earned academic qualifications abroad appear to be good at English, although there are some concerns about their proficiency level, their ability to lecture at a level suitable for their students, and their ability to interact with students. There are also problems relating to the curricula, which are considered outdated and inflexible (D. M. Le, 2012).

## Research Method

This case study research was carried out by a combination of qualitative and quantitative approaches. Data collected from surveys are analysed with descriptive statistics. To triangulate results, data collected from interviews and class observations are analyzed qualitatively. The study aims to understand the perceptions of EMI in a school in Vietnam, the challenges for implementing this EMI project, and the possible solutions to any challenges. Given these aims, the study addresses the following research questions:

1. How necessary is it to implement EMI at this school?
2. What are the challenges when implementing EMI in this school?
3. What are the suggestions to improve the EMI project implementation?

## Participants and Research Instruments

175 students completed the survey, 20 of whom were randomly selected for interviews. 20 teachers were also interviewed (see Appendix 1 for detailed information of the participants). The survey consists of 13 questions including both open and closed items (Appendix 2). The first part includes two questions to acquire personal information and preliminary information about EMI lessons. The second part consists of 11 questions aimed at investigating the following main aspects: (1) the students' perceptions of the project; (2) the learners' willingness to participate in the project; (3) the benefits students can get from the implementation of EMI; (4) the difficulties faced by learners in EMI lessons; and (5) the learners' suggestions to improve the use of EMI at the school.

In order to obtain more precise results, the questionnaire was written in Vietnamese to make sure of the students' thorough understanding. A short but concise explanation about the nature of the study was also given at the beginning of the questionnaire.

Classroom observations are used in order to find the interactions between teachers and students and real difficulties learners encounter in bilingual lessons (see Appendix 3). This method is useful in providing the researchers with a chance to witness, reinforce, and clarify the information they received from other data collection methods (Scott, 2010). The main purposes of the class observations are to get to know about: (1) the learning environment by gathering general information about the class, the number of learners, and teaching facilities; (2) the teaching procedure, types of activities, the use of teaching aids, and the amount of time using EMI; (3) the attitude of students in lessons using EMI and the learning atmosphere; and (4) the difficulties the teachers and students face in using EMI.

Interviews are used to obtain more detailed information about personal feelings, perceptions, attitudes, and opinions of the participants that questionnaires cannot elicit (Opdenakker, 2006). The interviewees in this study are divided into four subgroups (Appendix 4). All the questions used in the interviews were in Vietnamese to make sure all the necessary information was included. The aims of the interviews were to triangulate with the information achieved from surveys and class observations.

## **Data Collection**

Data were collected over three months with the help from the School Management Board and Heads of the relevant Divisions at the gifted high school. To begin with, the researchers delivered the survey to students majoring in English and in science subjects in six classes, two from each grade. The researchers carefully explained the purpose of the study and then distributed the questionnaires. The researchers answered any questions raised about the items on the survey while the learners were filling them in. All of the 175 questionnaires distributed were collected and used to gather information. For interviews, each group was interviewed separately. Before answering the researchers' questions, the purpose of the research was carefully explained. These informal interviews were conducted in Vietnamese and recorded. Interview findings were thematically analyzed. During each observation class, the researchers recorded observations in notebooks.

## **Data Analysis**

Questionnaire data were coded and analyzed with SPSS software. The process of entering the data was done together with a colleague to make sure of the accuracy of all the data entered. Once the data were coded and computerized, the results were tabled as frequencies of responses and percentages. The interviews and class observations were qualitatively analyzed to find out about the teachers' and students' perceptions of the use of EMI at the school, the benefits the students can gain from the project, and the challenges the teachers and students are facing in the implementation of the pilot project. With the help of SPSS, the correlation between these parameters has also been calculated.

## **Results and Discussion**

This section presents the details of data collected from surveys, class observations, and interviews concerning the EMI implementation along with a discussion addressing the three research questions. The overall alpha is much higher than .7, namely .850 (No. of items: 4). Thus, this value indicates the strong internal consistency among the answers of the participants. In other words, the data collected from the research are reliable.

## Perceptions towards Implementing EMI at the School

This section addresses the first research question. It relies on data from the questionnaires and interviews. The emerging themes included the necessity of the project, the enthusiasm for the project, and the benefits teachers and students can gain from EMI lessons.

### The students' perceptions

The role of the students in successful innovation is invariably accepted as important (Fullan, 2007). Therefore, it is necessary to find out their perceptions to ensure the success of any innovative plan. In the survey, students were asked to give their opinions about whether the project is necessary for students. Table 4 describes their overall ideas about that.

TABLE 1  
*The Students' Perceptions of the Necessity of EMI*

Likert scale	Frequency	Percent	Cumulative Percent
1. very necessary	27	15.4	15.4
2. necessary	81	46.3	61.7
3. neutral	50	28.6	90.3
4. not very necessary	9	5.1	95.4
5. not necessary	8	4.6	100.0
Total	175	100	
Mean: 2.37			

According to Table 1, the mean score of 2.37 can show that a great number of the students agreed that the EMI is 'Necessary' in general. Especially, 15.4% of the students thought that implementing EMI at gifted schools in the context of globalisation and integration was very necessary because of the benefits EMI could bring to them. When being asked to give reasons for their choices, these students revealed the following:

I think it is really necessary because I can know many scientific terms and science lessons will be less boring. (a Grade 12 student majoring in English)

This will create a new experience for students, and I will have more chances to follow high-quality training courses at university. (a Grade 12 student majoring in Chemistry)

I think it is necessary because nowadays English is becoming more and more important. Learning science subjects through English will help me improve my English. (a Grade 11 student majoring in Mathematics)

These positive attitudes towards the necessity of the EMI show that most of the students were ready to take part in EMI lessons. These were more clearly proved in interviews in terms of critical incidents. Most of them agreed that this project would be of great help if they had a chance "to study overseas." These findings illustrate Lo Bianco's (2010) argument that EMI has been increasingly adopted because English is a powerful language of scholarship. The data collected indicated that the EMI project could enhance students' mobility. They could get access to more job opportunities, travel overseas, and study abroad.

While 28.6% of the students had neutral opinions about the implementation of the project, there still remain 9.7% of the respondents who thought that EMI was not very necessary. In fact, 8 out of 175 students regarded teaching science subjects in English for students at gifted high schools as an unnecessary plan. Some of them explained their ideas as follows:

I think this project is nonsense because some students are not good at English. They will find it difficult to understand these lessons. (a Grade 11 student majoring in Physics)

I think it is not useful because these subjects are not easy to learn even in Vietnamese, let alone study in English. (a Grade 12 student majoring in Chemistry)

The current curriculum is really a burden for students. If they are asked to study some subjects in English, they will have not enough time to learn. (a Grade 12 student majoring in Chemistry)

TABLE 2

*The students' perceptions of the benefits of EMI*

What benefits will EMI lesson bring to you?	No.	%
a. Facilitating to search more useful materials on the Internet	163	93.1
b. Improving your English competence	140	80.0
c. Helping you know specialised terminology in English	137	78.3
d. Familiarising you gradually in case you intend to study overseas	76	43.4
e. Creating a favourable foundation to join advanced training courses at high quality universities	58	33.1
f. Helping raise the confidence and motivation in studying	49	28.0
g. Helping update latest information about new inventions and discoveries in science	33	18.9
h. Creating a sound basis in case you participate in Regional or International Science Olympiads	22	12.6
i. Helping you integrate with other students in other countries in the process of globalisation	8	4.6
j. Other ideas	2	1.1

As Table 2 depicts, 93.1% of the students surveyed thought that EMI helped them search for materials on the Internet better. One Grade 12 student majoring in English disclosed in the interview that online materials for science subjects were abundant, upto date, and useful if students knew how to make use of them. Moreover, 80% of the students agreed that they would improve their English proficiency levels if they followed EMI courses. 43.4% of the students indicated “international mobility” (Coleman, 2006) when they thought that EMI would be of great help in case they travel overseas or study abroad. Only 28% thought that EMI would motivate them to study and help raise their confidence. There were also two ideas adding that the EMI project would help attract foreign students to come and study in Vietnam and would help students interact with foreign ones when they visited the school. Tertiary students in Vietnam have also been found to share similar perceptions of EMI, as revealed in studies by Vu and Burns (2014), Dang et al. (2013), To (2010), and Le (2012).

### The teachers' perceptions

In interviews with the teachers, all of them agreed that the pilot project of teaching and learning science subjects in gifted high schools nationwide was very necessary for both teachers and students. Many reasons were provided, for example:

Nowadays, English really becomes an important tool and a must for any recruitment process or any scholarship application. Learning science subjects through English will help raise the awareness of students of the important role of English in this current context of the society. (a male mathematics teacher)

In my opinion, this project would be of great use for both content teachers and students if well undertaken. It would be a valuable chance to improve their English. We [English teachers] also

benefit a lot from EMI lessons. ... We can also help some students better prepare for SAT. Students would be well motivated to learn our subject [English]. (a female English teacher)

Indeed, the teachers highly appreciate the benefits of the EMI project, for their students and themselves. They listed many benefits students can from EMI. Most of these ideas coincide with the students' perceptions shown above. The teachers added that EMI also helped students to become international citizens, to know how to use English in real life contexts, and to increase self-study skills. Moreover, they revealed that when applying EMI, the teachers also benefited from this project. Not only could they improve their English proficiency, but they also had an opportunity to broaden their professional knowledge, to access scientific sources in their major field, to communicate with the international scientific world by taking part in international seminars, and to access new teaching approaches.

### **The administrator's perceptions**

The headmaster seemed to show full approval of the pilot project. He revealed that:

It is a timely decision of the MOET. It aims to build and develop specialized high schools into high quality secondary educational institutions meeting national standards as well as accessing advanced educational standards of the world in the process of integration. ... The teachers taking part in this project will have a chance to train in English-speaking countries. The students will develop self-study methods as well as English competence. All will help to make specialized high schools an epitome of other high schools in all aspects: facilities, teaching staff, students, and educational activities.

From the organizational perspective, this perception of the leader of the school coincides with the objectives and duties of the project. One of the important duties of the project is to hold short-term and long-term training courses for content teachers teaching Mathematics, Physics, Chemistry, Biology, and Informatics in English. The project also aims to send selected teachers to attend some training courses in English-speaking countries to boost both their language and academic competence. Compiling appropriate materials to facilitate the teaching and learning in EMI project is also a must in the pilot. It is widely hoped that some major high schools for the gifted will reach the level in education with other secondary schools in the region and the world (Vietnamese Government, 2008). He also added some advantages of gifted high schools in general when implementing the pilot project:

The equipment at gifted high schools is well-furnished and modernised regularly. Students in high schools for the gifted are well-chosen. They have to pass an entrance examination in which English is one of the compulsory subjects to be tested. ... They also have critical thinking and better motivation. Teachers are also carefully selected and well qualified. ... The English proficiency level of some teachers, especially the young ones, are quite good. This is an important factor deciding on the success of the EMI implementation.

Indeed, all of the teachers in charge of this pilot project are quite young—ranging from 25 to 41 years of age, energetic, and have quite good backgrounds in English. All of them have acquired B1 level of CEFR.

In summary, Vietnam, in the process of integration and globalisation, has placed new demands on the educational system. Therefore, multiple educational initiatives have been taken to improve its quality. In that regard, the EMI project seems to be able to integrate mixed agendas and is perceived as a purposeful means for leaders, teachers, and students to adapt to the changing world (Vu & Burns, 2014). Initially, the EMI implementation pilot project at the gifted high school has received quite a good evaluation. However, to adopt the EMI project successfully at the school, it is imperative to have an insight into the difficulties



the leaders, teachers, and students are facing; henceforth, suggestions to improve the implementation of the project will be addressed.

## Challenges in Implementing the Pilot Project

Since EMI was first initiated, the challenges of promoting EMI in academic programmes in non-English speaking countries have been reported. In Vietnam, Vu and Burns (2014), Dang et al. (2013), To (2010), and Le (2012) mentioned a lot of issues in implementing EMI at the tertiary level. In this section, the challenges the leaders, teachers, and students at the gifted high school are facing in the pilot EMI project are addressed, based mainly on the questionnaire and interview data. Generally, findings revealed that there were numerous challenges in adopting EMI, ranging from staffing challenges, methodological approaches, teaching material challenges, to management challenges.

Firstly, staffing challenges seem to be the biggest ones threatening the success of implementing EMI at the school. One aspect of staffing challenges is the lack of qualified EMI teachers. According to Dearden's (2015) research, 83% of countries responded that they did not have enough qualified teachers to deliver EMI lessons. It is not an exception at this school. Among 72 teachers of the school, there are 9 teachers from the Mathematics Department, 9 from Physics, 8 from Chemistry, and 6 from Biology obtaining appropriate English certificates such as C-level or B1 in the CEFR. However, as an older Chemistry teacher admitted, most of the teachers over 45 years of age did not have enough English competence to have daily conversations with foreigners, let alone teaching EMI lessons. As the headmaster revealed, teachers who were asked to teach the lessons in English often expressed their concern over either their linguistic accuracy in English or their anxiety over their mastery of academic content. Therefore, currently, only the young teachers of the school, with ages ranging from 25 to 41 in the science divisions, are asked and encouraged to take part in the pilot project. Even though they are young, energetic, and have good academic knowledge, they still have little experience in teaching, especially in adopting EMI. Furthermore, before delivering EMI lessons, they underwent some short-term training courses organized by MOET; therefore, it seems that they were not well-prepared for the EMI implementation. This is in line with the findings of *Vietnamnews* (2012), in which teachers nationwide were found not to be trained adequately to participate in the EMI project. One female Physics teacher confessed:

Two to three days of each training course is not long enough to grasp such a new and complicated problem. We just went there and sat to listen to long reports of some specialists, and finally received some materials to self-study. I think these workshops did not go into details. What we need to know is how to implement EMI in a real environment. We need to take part in long-term training courses at a specific university or to re-train to meet the demand of this new experience.

As Goodman (2014) pointed out, adopting EMI has become a real challenge as it is really difficult to find academic staff who are both proficient in English language skills and in content knowledge. He added that "teachers were either language experts with low content knowledge or were content experts with anxiety about their English language skills" (p. 130).

Overall, linguistic difficulties have really become an obstacle for the science teachers willingly delivering the EMI project at the school. Such problems potentially result in detrimental effects on students' learning, such as less content coverage and knowledge loss, as 88.6% of the students revealed in the survey. Finding teachers with a sufficient level of English and a proficient level of mastering knowledge content poses one of the greatest challenges for implementing EMI projects. As Dearden (2015) pointed out, content teachers were unaware of a language level, test, or qualification for EMI teachers. They had been nominated to teach in EMI because they had been abroad, spoke well, or had volunteered. Shohamy (2012) asserted that to become a successful EMI teacher requires combinations of linguistic, academic, and pedagogical competence. Few teachers at this school possess these qualities.

However, every improvement needs time (Vu & Burns, 2014). Therefore, first and foremost, it is suggested that content teachers should acquire a standard level of proficiency in English for EMI.

Another aspect of staffing challenges lies in the students' diverse language abilities. 65.7% of the students revealed in the survey that they did not have good language competence, especially in expressing ideas in English and in memorizing a lot of specialised terminology of different science subjects. This becomes a big challenge when they are faced with a relatively large number of lexical items which are unfamiliar or unknown to them as the teacher speaks (Macaro, 2015). Indeed, different English levels of the students make it difficult for teachers to select a threshold to teach, although a male mathematics teacher said that "the language of science has become universal." He added:

I will be so happy and comfortable when I have to deal with the students whose levels of English are better than mine because I just need to speak briefly and they will get the point. It will become a big challenge when my English is better than that of the students. At that time, it takes so much time to get them to know the contents.

Secondly, EMI adoption at the school is challenged by the teachers' methodological approaches. As Vu and Burns (2014) pointed out, pedagogical issues could affect both experienced and novice lecturers. According to Coyle et al. (2010), methodologically, the implementation of EMI projects requires teachers to adjust their teaching methods, including the adjustment of their speaking pace, the presentation of content knowledge in a foreign language, and classroom management practices.

Also, teachers struggled to find effective teaching methods. The findings from the survey among students revealed their perceptions of the teachers' pedagogical methods. 55.4% of students reckoned that they found the teachers' methodology still passive and not interesting enough. Furthermore, from the observations, only a few classes (2 out of 7) were taught with the help of computers. As many students revealed in the survey, the absence of information technology in EMI classes made the lessons less interesting and difficult to comprehend, and the teachers wasted time rechecking new words because very often they were not sure of the spelling of the words they had written on the board. The factors have unintentionally demotivated students in EMI lessons.

The third challenge that the teachers and students are facing in the EMI project lies in obtaining sufficient core textbooks and supplementary teaching materials in English. This problem also exists in many non-English speaking countries (Dang et al., 2013; Dearden, 2015; D. M. Le, 2012). At this school, 53.1% of the students surveyed thought that one of the difficulties in studying EMI courses was that the current textbooks were not suitable for EMI teaching and learning. All the teachers interviewed agreed with this challenge. A female teacher of Biology clarified:

Whenever I have an EMI lesson, I have to translate the contents in the textbook into English. However, translation is always a problem for me. Materials are available online, but so abundant and hard to find the most suitable ones for the required curriculum fixed by MOET. As you [the researchers] know, secondary teachers cannot be flexible in adjusting the core textbooks. The current textbooks contain so much information and to some extent are so academic that I find it challenging to adopt EMI.

The last challenge disclosed from interviews with the leader and teachers is related to management problems. The fact that the project is being piloted at the school has created quite a lot of problems for administration. Another difficulty lies in the fact of who can evaluate EMI lessons when English competence is one of the problems. The headmaster revealed that currently one EMI teaching assessed 'good' or not is mainly based on asking students afterwards about their comprehension. Furthermore, all the teachers interviewed questioned the policy to raise their incentives to continue EMI. As they disclosed, they did not receive any encouraging policies that are worth their time and effort to adopt EMI lessons. However, in the near future, as the leader mentioned, each EMI lesson would be weighed as three, so that

the teachers' workload would decrease and they would have more free time to invest in EMI lessons. One more problem related to management challenges is exams and assessment. 50.9% of the students surveyed thought that the assessment methods for EMI lessons were not suitable. The teachers admitted that due to the policy and pressure on marks, it was impossible to design all test items in English. Dearden (2015) raised a lot of tricky questions related to EMI assessment such as "Do teachers have a sufficiently high level of English to write and mark exams?" or "What is being assessed: the English or the subject content?" (p. 5).

In short, there have been multiple challenges in adopting EMI at the school. To deal with all these challenges requires time and effort of all stakeholders in the project.

### **Suggestions to Improve the EMI Implementation at the Gifted High School**

From the students' points of view, when asked about the suggestions to adopt the EMI project at the school more effectively in the future, many students contributed valuable ideas. First of all, regarding the number of EMI lessons, 36% of the students recommended that one EMI lesson per month for each science subject would be ideal. About 33% suggested having an EMI lesson every two weeks, whereas 25% thought that it would be better to learn EMI in each subject every week. In the interviews, most of them pondered that despite the importance and the need for EMI in the changing educational system, having all lessons in English would be unrealistic. They added that few students and parents would support this idea because of the burden from the curriculum and the pressure of the entrance exam for university. Secondly, the appropriate combination between L1 and L2 in teaching was also suggested. Approximately 49% of the students suggested that teachers should only use 30-50% of English in EMI lessons to make sure of their comprehension of the contents. Roughly 41% of the respondents considered 50-70% of English usage in the lectures as appropriate. A Grade 12 student recommended that, depending on the level of difficulty of the lessons, teachers should use an appropriate amount of English to guarantee the students' understanding. Thirdly, most of the students thought that the teachers in charge of EMI should pay more attention to their pronunciation. They expressed that if the teachers pronounced words in an imperfect way, that would affect the students' pronunciation in the long term. One student suggested inviting native teachers to deliver EMI lessons at the school.

Another suggestion by the students is that EMI teachers should spend more time preparing for the lessons carefully. They added it would be better if teachers used computers regularly in EMI classes. More pictures and video clips should be added to slides to make the lessons more colourful and interesting to attract students. Also, it was suggested that teachers' interaction with students should be improved during the lessons. Furthermore, it was widely suggested that EMI should become an elective course. A threshold should be established to select the students who would like to follow EMI courses. Therefore, the level of English proficiency of students will ensure the success of the project. Certainly, there should be encouraging policies to attract students to these classes.

All teachers interviewed provided valuable recommendations for more effective EMI implementation at the school. Firstly, objectives of the project should be widely spread to more teachers, students, and parents. One of them remarked:

This project should become a common concern of all teachers and students, not just of only science teachers or students involved. The more people know about this project, the better it will be adopted. Especially, more parents should be well-informed, so that we will receive more support and favourable conditions to implement the EMI project.

The second suggestion is related to the policies leading to the implementation of the project. All teachers advocated that the leaders of the school should pay more attention to having suitable encouraging policies to motivate EMI teachers and students. One of them said:

There was no difference between teachers using EMI and the ones who do not. Preparing for an EMI lesson takes so much time and effort, but we receive nothing but our own experience. In my opinion, there should be certain policies, maybe not of finance. I think reducing the standard teaching volume per week for EMI teachers is OK. To students, scholarship will be a great incentive.

Thirdly, it was suggested that the MOET should issue clearer guidance on how to deliver EMI courses and how to evaluate their effectiveness. Textbooks for EMI should also be published soon. Moreover, using English in science subjects in exams should be legalised. EMI students should be encouraged to take exams in English and be given priority in the university entrance exam. One teacher said:

The students who take part in EMI project should be given more preference. That will attract more students to be involved. Otherwise, they will not have any motivation to continue studying EMI.

Finally, some teachers recommended that the leaders should create more favourable conditions, especially in terms of finance, for them to participate in domestic and overseas EMI training courses and workshops to get more experience.

In summary, the findings reveal that the leader, teachers, and students mostly perceive that it is important and necessary to implement EMI in the school. However, there still exist a lot of challenges the leader, teachers, and students are facing in order to adopt EMI successfully. These challenges range from staffing, teaching methodology, materials, to management. In addition, various suggestions from the teachers and students were also made with a view to improving the implementation of EMI at the school.

## Conclusion

Based on the previously discussed challenges, the study suggests several implications for policy makers, school leaders, content teachers, and language teachers. As for policy makers, more than half of the time has passed since the introduction of the project. Many seminars have been organised nationwide; however, they did not provide an overview of the EMI adoption in real contexts. It is time to conduct empirical research on EMI application in gifted high schools on a national scale in order to have a detailed evaluation of the effectiveness of the project. From these findings, the current situation in applying EMI in different cases across Vietnam must be carefully examined to work out the best solutions for improving EMI implementation.

Second, it is imperative to issue thorough guidance on how to deliver education through EMI. Relevant textbooks and supplementary materials should be designed and published as soon as possible to facilitate all EMI teachers and students in teaching and learning. Third, long-term training courses should be organized more regularly and effectively nationwide to train current content teachers, especially those from underprivileged regions, in English language skill enhancement as well as in methods of teaching content in English. Fourth, top universities of education should include disciplines of EMI to teach students and have policies to encourage students to enrol in these courses. Finally, the use of English in science subjects in national exams should be legalized. Students should be encouraged to take such tests and should be given priority in grading or in university enrolment.

Regarding the school leaders, it is advisable that the school should reserve some funding from the annual budget for EMI teachers to retrain in domestic or overseas institutions in how to deliver EMI lessons effectively or to engage in study tours in English-speaking countries or international conferences. Furthermore, encouraging policies for both EMI teachers and students should be formulated as soon as possible to attract more teachers, especially experienced ones, and more students to participate in the project. Second, the objectives and benefits of the project should be promoted more widely to all teachers, students, and parents to help them fully perceive the necessity and importance of EMI in the modern

context. Third, language support should be provided for all EMI teachers to enhance their proficiency for teaching academic content. English courses specifically oriented to academic teaching should be organized at the school regularly so that all content teachers of science subjects could attend. Furthermore, English clubs should be established for the students to create a favourable environment for them to communicate in English on a regular basis. Finally, EMI teachers should first be screened for their language abilities, especially their oral skills, and confidence in lecturing in English and handling questions from students. This could be done in simulated or actual classroom situations where prospective EMI teachers are observed as they teach an EMI lesson.

As for content and language teachers, content teachers should develop more self-study skills and should have a close cooperation with language teachers to have detailed plans to raise the students' competence in English, especially English in scientific fields, to enable them to enhance their knowledge and to be able to acquire scientific thinking in English. Content teachers should also spend time attending as many training courses in EMI as possible. In addition, those who are experienced in lessons in L1 should set up a detailed plan to upgrade their English competence and should be more willing to teach EMI classes. Content teachers should set up a more detailed and long-term schedule for EMI lessons and suggest which sections of the textbooks are suitable for full EMI adoption. Language teachers should share experience and help content ones with language problems. They should think of suitable methods to raise the students' English level and enthusiasm to meet the requirements of the EMI project. Language teachers should also spend time studying some specialized terminologies of science to provide help if required.

In conclusion, with the growing trend of globalization (Nguyen, 2013), Vietnam's education needs radical reform. The project to use EMI in maths and science subjects initiated by MOET in gifted high schools nationwide is considered as part of this reform. The aim of the project is positive in the aspect of raising the awareness of the importance of English in the modern context as well as of accessing innovative teaching and learning methods. Despite facing multiple challenges, the EMI implementation in this school has been, to a certain extent, successful. To meet the requirements of the new curriculum from the EMI project, both teachers and students nationwide must try their best to overcome the initial difficulties that may arise. With every effort made, the prospect for EMI in Vietnam is promising.

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## Appendix A

### Information about the Participants

#### Survey participants

The informants of this survey consist of 175 students of 3 grades who have been experiencing EMI. There are 73 males and 102 females aged from 16 to 18. In each grade, two classes are chosen.

TABLE 1  
*Description of the Students Participating in the Survey*

Grade	Major subject	Number of students	Gender	
			Male	Female
10	English	30	5	25
10	Biology	30	11	19
11	Mathematics	30	19	11
11	Physics	30	18	12
12	English	26	3	23
12	Chemistry	29	17	12
<b>Total</b>	<b>6 classes</b>	<b>175</b>	<b>73</b>	<b>102</b>

#### Interview participants

The participants for interviews are divided into two groups. The first group includes 20 teachers (7 males and 13 females). Their ages range from 25 to 59 with 3- to 37-year teaching experience.

TABLE 2  
*Description of the Teachers Participating in the Interview*

	Male	Female	25-30	35-40	45-50	50-55	55-60
Leaders	1	0	0	0	0	0	1
Mathematics teachers	3	1	1	1	1	0	0
Chemistry teachers	4	2	1	1	1	1	0
Physics teachers	3	1	2	1	0	0	0
Biology teachers	3	3	1	1	1	0	0
English teachers	6	6	0	3	3	0	0
<b>Total</b>	<b>20</b>	<b>7</b>	<b>13</b>	<b>5</b>	<b>7</b>	<b>6</b>	<b>1</b>

The second group consists of 20 students (7 males and 13 females). They were selected randomly among those who had completed the survey to help clarify more details.

TABLE 3  
*Description of the students participating in the interview*

Grade	Major subject	Number of students	Gender	
			Male	Female
10	English	4	2	2
10	Biology	2	0	2
11	Mathematics	5	1	4
11	Physics	2	1	1
12	English	5	2	3
12	Chemistry	2	1	1
<b>Total</b>	<b>6 classes</b>	<b>20</b>	<b>7</b>	<b>13</b>



This critical incident technique is a scientific tool to help uncover existing realities or truths so they can be measured and predicted. It consists of a set of procedures for collecting direct observations of human behavior in such a way as to facilitate their potential usefulness in solving practical problems and developing broad psychological principles and for collecting observed incidents having special significance and meeting systematically defined criteria (Butterfield, Borgen, Amundson, & Malio, 2005, p. 482). All of the interviews in this research were recorded and conducted independently with each group.

## Appendix B

### Questionnaire for Students

The survey aims at finding out how students at [redacted] perceive the programme to teach some science subjects through English implemented at the school (EMI). Your answers will contribute a lot to the success of the research. All the information provided on this survey will be kept confidential and is only analysed for the research purpose solely.

**I. PERSONAL INFORMATION:**

1. Grade:

10

11

12

2. Major in: .....

**II. QUESTIONS** (Please tick (✓) on an appropriate option)

1. In your opinion, is the project on teaching some science subjects through English initiated by MOET necessary?

- Very necessary
- Necessary
- Neutral
- Not very necessary
- Not very necessary

Why do you have that opinion?: .....

2. Initially, did you feel interested when you were informed of the possibility to study some science subjects in English?

- Very interested
- Interested
- Neutral
- Not very interested
- Not interested

Why did you have that feeling?: .....

3. After some time experiencing EMI at the school, do you remain interested?

- Still very interested
- Still interested
- Neutral
- Less interested
- No longer interested

Why do you have that feeling?: .....

4. What are the subjects having been taught in your class so far? How many lessons a week for each subject?

Subject (Please tick (✓) on an appropriate box)	Number of lessons per week
<input type="checkbox"/> Mathematics	.....
<input type="checkbox"/> Informatics	.....
<input type="checkbox"/> Physics	.....
<input type="checkbox"/> Chemistry	.....
<input type="checkbox"/> Biology	.....

5. What do you think of the amount of time allotted to EMI lessons in your class?
- Too much
  - Much
  - Moderate
  - Little
  - Too little
6. In your opinion, what benefits will EMI lessons bring to you? (you can choose more than one option)
- Improving your English competence
  - Helping you know specialised terminology in English
  - Facilitating to search more useful materials on the Internet
  - Familiarising you gradually in case you intend to study overseas
  - Helping you integrate with other students in other countries in the process of globalisation
  - Creating a sound basis in case you participate in Regional or International Science Olympiads
  
  - Creating a favourable foundation to join advanced training courses at high quality universities
  - Helping update latest information about new inventions and discoveries in science
  - Helping raise the confidence and motivation in studying

Other ideas: .....

.....

7. What are the challenges or difficulties you often meet in EMI lessons? (you can choose more than one option)
- Grasping and memorising specialised terminology in English
  - Your not having a good command of expressing ideas in English
  - Teachers' problems of pronunciation, accent and intonation
  - Grasping the contents in EMI lessons more difficult than those in lessons using mother tongue
  - Core textbooks and supplementary materials not very suitable in EMI lessons
  - Not very effective teaching methods
  - Not very appropriate evaluation and assessment
  - Your not having enough time to spend in EMI lessons

Other ideas: .....

.....

8. In your opinion, will EMI lessons influence your performance in the entrance exam to university?
- So much
  - Much
  - Neutral
  - Not so much
  - Not at all
9. In your opinion, how many EMI lessons per week are appropriate for each subject?
- One lesson a week
  - One lesson every two weeks
  - One lesson a month
  - One lesson a semester
  - One lesson an academic year

Other ideas:.....  
.....

10. In your opinion, what percentage of English used in EMI lessons is appropriate?

- 10-30%
- 30-50%
- 50-70%
- 70-100%

11. Do you have any suggestions for school administrators and teachers in implementing the project on teaching some science subjects through English in the coming time?

.....  
.....  
.....

**\*\*\*Thanks so much for your cooperation!\*\*\***

### Appendix C

#### Observation Sheet

Date: .....

Class: .....

Number of students: .....

Teacher in charge: .....

**CHECKLIST:**

- Turn students take to respond to the questions?.....
- Teacher talking time?.....
- Student talking time?.....
- Number of linguistic mistakes?.....
- Number of teachers'?.....
- Number of students'?.....
- Pronunciation?.....
- Spelling?.....
- Grammar?.....
- Teacher talking time?.....
- Information technology?.....
- English talking time?.....
- Vietnamese talking time?.....
- Class atmosphere?.....
- Students' note-taking?.....
- Students' understanding?.....

### Appendix D

#### Questions for Interview

The survey aims at finding out how students and teachers at [redacted] perceive the programme to teach some science subjects through English implemented at the school (EMI). Your answers will contribute a lot to the success of the research. All the information provided on this survey will be kept confidential and is only analysed the research purpose solely. Thanks so much for your cooperation.

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### **FOR SCHOOL ADMINISTRATORS**

1. How has the project on teaching some science subjects through English initiated by MOET been implemented at our school? In your opinion, has this project been considered successful so far? If yes, to what extent?
2. What are the favorable conditions and difficulties in implementing the project at your school?
3. What criteria have been adopted in choosing the teachers for EMI lessons at your school?
4. What are the incentives that have been provided for EMI teachers at your school so far?
5. Do you think that EMI lessons have exerted any pressure on yourself, school teachers and students? If yes, to what extent?
6. What are your future plans for implementing the project at your school?
7. If you meet any objections from parents and teachers to the project, what will you do?

### **FOR TEACHERS IN ENGLISH**

1. What do you think of the necessities of the project on teaching some science subjects through English initiated by MOET? In your opinion, has this project been considered successful at our school so far? If yes, to what extent?
2. What do you think of the objectives of the project on teaching some science subjects through English?
3. In your opinion, have EMI lessons affect the students' results of English subject at school? If yes, to what extent?
4. Do you often assist EMI teachers and students who participate in this project? If yes, to what extent?

### **FOR EMI TEACHERS**

1. What do you think of the necessities of the project on teaching some science subjects through English initiated by MOET? In your opinion, has this project been considered successful at our school so far? If yes, to what extent?
2. What percentage of English is used in your EMI lessons?
3. Do you receive any incentives when participating in the project?
4. In your opinion, what is the most difficult in using English in teaching your subject? (Grammar, pronunciation, vocabulary, communicative competence...)
5. Are you pleased with the project implementation at the classes you are in charge of? Why/why not?
6. Are you willing to continue with the project? Why/why not?

### **FOR STUDENTS PARTICIPATING IN EMI LESSONS**

1. What do you think of the necessities of the project on teaching some science subjects through English initiated by MOET? In your opinion, why are gifted high schools chosen to implement this project initially?
2. What is the most difficult in studying EMI lessons? (Grammar, pronunciation, vocabulary, listening/speaking/reading/writing skills...)
3. What do your parents think of your participation in the project?
4. Do you achieve any improvement in both English language and EMI subjects?
5. Are you willing to continue with the project? Why/why not?