

## EMI FOR ENGINEERING-TECHNOLOGY STUDENTS IN VIETNAM: CHALLENGES & SUGGESTIONS

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**Abstract:** The paper aims to shed light on EMI challenges from the perspective of engineering-technology students at various universities in Vietnam where EMI is in current and popular usage. A total of 307 questionnaires were delivered and returned, among which 288 were qualified, and 27 respondents were selected for in-depth interviews. Data from the questionnaires and interviews were analyzed along with information gathered from respondents' journals. The findings indicate that Vietnamese engineering-technology students encountered different EMI-related challenges, typically subject matter content and vocabulary. They suggest several solutions, such as teachers using both Vietnamese and English rather than solely English in EMI classes. It is hoped that learners' perceptions of the difficulties they encountered and their proposed solutions to cope with such difficulties will help relevant stakeholders to make appropriate adjustments to the teaching methods and content accordingly, which is the key message that this study yields.

*Keywords:* EMI, ESP, engineering, technology, Vietnam

### 1. Introduction

There is no doubt that teaching English for Specific Purposes (ESP) in particular, and discipline-specific language in general, still faces with many difficulties, including the debate about who is the most suitable ESP teacher, English teacher or content teacher (Stevens, 1988; Anthony, 1997; Larson-Freeman, 2000; William, 2010). For example, ESP for Law students should be taught by an English teacher, or a Law teacher who teaches Law in English. Following the latter trend, English as a Medium of Instruction (EMI) was born and developed, complementing the former one. In addition to ESP and EMI, there are many other approaches such as CBI (content-based

instruction), CLIL (content and language integrated learning), and so on. It can be said that no model or approach is superior, but they only complement each other. Unfortunately, this is not entirely understood or agreed upon in our country, which contributes to several problems like those experienced by the participants in the present study.

Using English as a Medium of Instruction is of cultural and political significance in countries where the official language or the first language is not English (Vinke, 1995; Madileng, 2007; Hu, 2008). Being regarded as a medium to modernize and develop their nations, an international language for business, tourism and

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education, and the common language of government, business and society in many countries, English has been used as a teaching-learning language in higher education, which can be seen as an important educational trend (Graddol, 2000, 2006).

In Vietnam, various public and private educational institutions have fast-track or international programs that teach several majors in English. Even high schools have had a number of subjects such as Math and Physics trained in English, which means EMI has been applied widely. In addition to its undeniably positive aspects, EMI poses many challenges and difficulties to students, but EMI has not been studied thoroughly and comprehensively in Vietnam.

The desire to improve the efficiency of EMI in classes for engineering and technology students has inspired the researchers to accomplish a VNU-funded research project entitled *The use of English as a medium of instruction in Vietnam: Engineering - Technology students' perceptions, challenges and coping strategies* (coded as QG.20.42). It is hoped that this study can foster students' progress in their English learning, which ultimately meets the country's requirements in the context of extensive international integration, and this paper presents part of the research results.

## 2. EMI-Related Research to Date

English has become the global teaching medium of instruction, and it is increasingly used in countries teaching English as a foreign language to provide science and engineering related courses. As regards the issue on whether EMI should be integrated into the curriculum, there exist two conflicting opinions among scholars around the world, especially in Asian countries where English is used as a second or foreign language.

On the one hand, supporters of the

use of English as a medium of instruction claim that it can benefit students by helping them improve their English skills, especially listening skills (Cheng, 2010), and enrich their English knowledge (Byun et al., 2011; Floris, 2014; Belhiah & Elham, 2015). On the other hand, students with limited English proficiency find EMI lessons difficult to cope with, saying the subject content delivered even in their native language is hard to comprehend, and a lack of coping skills to be successful within EMI emerges a dominant challenge (Airey & Linder, 2007; Sert, 2008; Kim & Sohn, 2009; Cheng, 2010). Lau and Yuen (2011) studied the impact of EMI on computer programming students in Hong Kong and discovered that students who were taught in Chinese tend to outperform those taught in English. Besides, EMI has minimized interaction between teachers and students, hindered discussions among students, and decreased graduation rates (Airey & Linder, 2007; Collins, 2010; Byun et al., 2011). Furthermore, the lack of clear guidance on how to teach through EMI, the lack of English proficiency standards for EMI teachers, and the lack of qualified EMI teachers are major concerns when English is used as a medium of instruction in many non-English speaking countries (Dearden, 2014).

In recent years, many Vietnamese pedagogists and linguists began to shed light on EMI in colleges and universities, which is an emerging trend in Asia. Some authors emphasized the importance of adopting EMI at university such as Le Duc Manh (2012) or Dang Thi Kim Anh et al. (2013) while Nguyen Thu Huong et al. (2017) proposed policy recommendations on EMI programs. Also, Do Minh Hung (2017) focused on the challenges faced by teachers when EMI was adopted at a public university in the Mekong Delta, Vietnam. An on-going study by Lam and Le (unpublished manuscript) on how pre-service teachers are prepared for EMI at a university in Vietnam reveals that EMI

doubles their work, since they have to read both English and Vietnamese materials so as to ensure accurate understanding, especially if it concerns difficult, abstract concepts. Reading remains the hardest skill for them due to their lack of both specific terminology, or vocabulary, and relevant conceptual knowledge underlying those terms. Even when they understand the terms, the concepts, and their English proficiency may be satisfactory, they still find it hard to explain things in English. It can be concluded that a good command of English, together with a sufficient specific lexicon, may not be enough for them to be good EMI teachers.

In a study on the Vietnamese agenda for adopting EMI, Vu (otherwise known as Nha, Vu Thi Thanh, 2017) identified three levels for such an agenda, namely the national socio-political, the institutional educational, and the personal levels. At the national socio-political level, “Vietnam has undergone significant socio-economic changes in the last few decades, which has influenced the expansion of English and its role as a means of economic and social development” (p. 59). To educational institutions, EMI seems to be a boosting solution, while personal motives for adopting EMI varied; the majority of students in the study merely take it because it is compulsory, but they saw several benefits from EMI, including their improved access to learning materials and up-to-date knowledge in the [English] original, and their increased international mobility upon graduation. It was already pointed out in an earlier study by Hoang (2008, pp. 33-34) that “Experience in some Asian countries such as Singapore, the Philippines, Thailand and Malaysia shows that the most effective way to improve ELT quality in universities is to turn them into bilingual environments in which the mother tongue is the means of general communication and the instructional medium of social science subjects, and

English is the instructional medium of science and technology.”

It can be seen that EMI research has proliferated but has mostly been conducted in the Inner Circle nations where English is regarded as their native language, and the Outer Circle, which uses English as a second language such as Indonesia, Malaysia, the Philippines, and Nigeria. In the Expanding Circle nations like Vietnam, however, not much has been done. Therefore, by implementing the present study, the researchers hope to contribute more insights of EMI’s positive and negative effects to both learners and teachers at Vietnamese universities. This is also a response to Dearden’s call which include such questions as

- What are the different forms of EMI currently being developed?
- Are there particular language problems associated with particular content areas?
- Is the learning of academic subjects improved by EMI? Does it lead to deep understanding? If so by which groups of students? All students? Only international students? Only home students?
- What strategies are used by students in EMI classrooms in oral and written comprehension tasks which are designed to facilitate their understanding of their academic subjects?
- What are the psycholinguistic and sociolinguistic effects on students’ home language resulting from EMI used in various phases of education? (Dearden, 2014, p. 3).

In fact, the current job market in the world requires graduates to be fluent in English. Furthermore, English is necessary to maintain international dialogues between countries, and to help countries keep up with changing standards of knowledge, technology and business. Communication in

English plays an important role in digital work and industrialization (Kakepoto et al., 2012). Prichard and Nasr (2004) argued that English is the language of science and, therefore, indispensable in modern sciences. Therefore, English is believed to be able to improve the quality of education in engineering and related sciences (Tamtam et al., 2010). In Vietnam, according to the statistics of the National Institute of Information and Communication Strategy, science and technology is the leading industry with the highest demand for human resources (PwC, 2021). The fact that the world is always innovating requires people to respond to keep up with the speed of development. In particular, the Industrial Revolution 4.0 period is the time when technical service jobs require the highest productivity, and wages in this industry are increasing. Undoubtedly, clear and concise communication is fundamental to success in the modern global business environment. Therefore, it is important for engineering-technology graduates to be equipped with writing and communication skills in English, along with other essential skills, to be able to promote the business of the organization in which they work and meet customer's need (Abdel-Jawad & Radwan, 2011).

From that perspective, a good number of studies around the world on using English as a medium of instruction for engineering-technology students have been conducted such as Tamtam et al. (2010), Basibek et al. (2014), Sivaraman et al. (2014). According to these researchers, one aspect of the learning process of engineering-technology students is the use of mother tongue and translanguaging in English classes to communicate with classmates as well as teachers. By definition, translanguaging is “the ability of learners to convert and process diverse languages” (Canagarajah, 2011, p. 401). Furthermore, it refers to “hybrid forms of linguistic use that are systematically involved in the production

of meaning” (García et al., 2011, p. 5). Translanguaging can facilitate communication and interaction between students and teachers, help students express their ideas, and is increasingly used in the academic community as a means of communication and as an approach to teaching science-related courses in bilingual education (García, 2009). As such, translanguaging can be regarded as a scaffolding tool to achieve content learning, aiming to deepen students’ understanding, develop their metacognitive and metalinguistic awareness, develop pluriliteracies and expand their cognitive and linguistic experiences (Canagarajah, 2011; Kano, 2013; Langman, 2014). The idea of bilingual education (translanguaging) was also supported by Barnard (2015) when he found that most EFL/ESL students in Asia lacked the ability to actively participate in academic lectures taught in English. Therefore, he proposed bilingual education because this approach will better prepare students to meet the challenges of today’s globalized world. This study, therefore, sought to find out whether the participants were aware of translanguaging and may propose it as a solution to the problems they encountered in EMI courses.

As part of the afore-mentioned research project QG.20.42, on the basis of the above rationale, this paper deals with the two following research questions:

1. *What challenges did engineering-technology students encounter with EMI?*
2. *What suggestions did engineering-technology students propose to overcome such challenges?*

### **3. Research Design**

In this study, a critical exploratory methodology was adopted with a two-phase sequential mixed methods approach of data

collection and data analysis. The first phase was quantitative and the second was qualitative. The critical exploratory methodology reflects the research agenda of the study that seeks to understand the effects of EMI on the learning experiences of individuals in a certain social and educational context. The view that “we can often learn more about our research topic if we can combine the strength of methods focused on quantitative data with the strength of methods focused on qualitative data, while compensating at the same time for the weaknesses of each method” (Punch & Oancea, 2014, p. 339) constitutes the rationale for the use of a sequential mixed methods approach in this study.

### **3.1. Sampling**

In this study, the researchers employed purposive sampling where the participants were identified according to specific criteria and characteristics (Dörnyei, 2007; Punch & Oancea, 2014; Ritchie et al., 2014). The criteria for sample selection from the target population is to include both male and female students (307 students) enrolled as different engineering and technology majors at various tertiary educational institutions (11 institutions). The rationale for this adoption is to ensure the sample is as diverse as possible so that a full range of perceptions and behaviors related to issues on EMI can be identified. It is hoped that this will provide a comprehensive picture of the issues under investigation and will allow participants from various engineering and technology disciplines to demonstrate their views on and experiences in EMI.

### **3.2. Research Methods**

As regards the quantitative phase, questionnaires were used (see Appendix A). Questionnaires have become one of the most popular research methods applied in social sciences (Dörnyei, 2007). Questionnaires

can be easily constructed and have the advantage of collecting large amounts of information about research subjects through a representative sample. However, they also have limitations because they often provide rather superficial data and are therefore not suitable for in-depth investigation of a phenomenon (Dörnyei, 2007). However, questionnaires are the main data collection method used in EMI studies (Al-Mashikhi et al., 2014; Belhiah & Elhami, 2014; Chapple, 2015; Kym & Kym, 2014; Sert, 2008). In this study, we designed a closed questionnaire. Quantitative data obtained from statistical analysis of questionnaires were used as a starting point to show the overall trends of participants in courses where EMI was applied. It also provided background information about the study population and those willing to participate in the second phase of the study. Most importantly, it assisted us in preparing for the construction of the in-depth semi-structured interview to be used in the second phase. Besides, in the questionnaire, the 5-point Likert scale was adopted to elicit the participants' attitudes and behaviors. Students were asked to circle a number from 1-5 reflecting how much they agreed with the following variations: strongly disagree (1), disagree (2), undecided (3), agree (4), totally agree (5). The reason for this choice is that the 5-point Likert scale is simple to understand and use for survey administrators and respondents alike. Besides, it takes less time and effort to complete than higher-point scales and gives respondents an option to be neutral (rather than having to choose an alternative that does not reflect their thinking). The participants only had to select the number that was closest to their opinions; therefore, even not very enthusiastic ones could feel comfortable to answer all the questions. To design a closed Likert questionnaire (Appendix A), we followed the guidelines provided by Dörnyei (2007) and Wellington (2015). Questionnaires are

tailored to the research questions, relevant EMI literature, and our own knowledge or our experience teaching students in an EMI applied environment. This helped us establish the content and build the validity of the research tools. In addition, the language used in the questionnaire is Vietnamese to avoid misunderstandings for the participants. To ensure the reliability and validity of the questionnaire (Wellington, 2015), we asked three of our colleagues to review it. We also piloted this questionnaire with 25 students who were our acquaintances. From the feedback of these teachers and students, we adjusted the items in the questionnaire. The questionnaires were then delivered in classes that met the above mentioned criteria (consisting of both male and female students enrolled as different engineering and technology majors at various tertiary educational institutions) to ensure that the sample size was large enough. Information on the number of participants at each university is presented in Appendix C. At each university, a class majoring in engineering-technology was selected, and a total of 307 students were given the questionnaires and returned their responses. However, 19 had to be discarded as they were incomplete or unreliable, containing the same answers for almost all items. Eventually, 288 responses qualified, of which male students ( $n = 176$ ) outnumber females ( $n = 112$ ). Most participants were between 18-22 years old, and all were Vietnamese citizens studying at public and private universities in Vietnam. Although this was considered a large number for a purposeful model, not all of these students participated in the later stages of the study. In terms of data analysis, after the data collection process, the information obtained from the questionnaire was classified according to the research questions. Then, for each research question, the participants' responses were calculated and converted into numerical form. The data are then

tabulated and graphed for clearer presentation and comparison.

Turning to the qualitative phase, an in-depth semi-structured interview was adopted (see Appendix B). Interview is the most prominent research method in qualitative research (Dörnyei, 2007; Kvale, 2007; Punch & Oancea, 2014). In EMI studies, interviews are sometimes used in conjunction with questionnaires (Cheng, 2010; Evans & Morrison, 2011; Troudi & Jendli, 2011). In-depth interviews were chosen in this study because they allowed the researcher to explore the participants' perspectives and perceptions (Punch & Oancea, 2014). Furthermore, interviews aim to give participants the opportunity to express their views to others in society (Wellington, 2015). For this study, we found semi-structured in-depth interviews with EMI students to be the most appropriate. An in-depth interview is an interview based on a list of questions or topics that need to be covered. However, the order and manner of asking questions may depend on the context and characteristics of the interviewee. In-depth interviews are used to thoroughly understand a particular topic. In this phase, we also used Vietnamese in order to collect as much information about the topic studied through questionnaires in the earlier stage. On that basis, we would have a comprehensive view and understanding of learners' attitudes, behaviors and feelings. It also revealed to us the reasons behind participants' views and actions, something that previous data collection methods had not uncovered. Most importantly, the interviews not only showed us the general opinion of the majority of the participants, but also revealed information not shared by the majority. The interview data combined with the data collected from the

questionnaire allowed us to get the best answers to the research questions. Of the 288 students who completed the questionnaires, 53 agreed to be interviewed. Through purposeful sampling, 27 students were selected for in-depth semi-structured interviews. The goal was to select the most diverse group that came from the different universities (as listed in Appendix C) to collect a variety of EMI-related information, perspectives and experiences. Therefore, 16 male and 11 female participants from different universities and levels were selected. The background information of the students participating in the qualitative phase is presented in Appendix D. As regards data analysis, the information recorded from the interview was then classified based on the research questions. For a deeper understanding of the information obtained from the participants, we compared and contrasted the responses in each group. All transcripts of the responses of the participants in the interviews were summarized and presented in the form of citations so that, when necessary, more detailed information on the research questions could be provided. Page numbers of citations in the transcript are attached so that we can refer to them as needed.

Furthermore, the method of narrative research (Creswell & Creswell, 2018) was used to gather data in the field of social sciences and humanities with a special focus on stories personally retold (Polkinghorne, 1995). To get more detailed information for the study, we selected 27 students who participated in the semi-structured interview phase to continue asking in-depth interview questions to analyze the information through their narrative. In fact, the participants could not provide all the information on their own without being asked or suggested by the researcher.

In addition, to increase the reliability of the information obtained, we also used the students' journals. Journals are tracked over days, weeks, or possibly years. We developed a guide that participants could use to document their experiences with EMI. The guiding questions are closely related to the main content that the research is aiming to address, including the challenges, and suggestions of students when EMI is implemented in the curriculum. Respondents self-record the data of events about the work or activity taking place. We distributed the journal entry instructions to the respondents via email and collected the journal monthly.

As a translator, translator trainer and translation researcher with over 30 years of experience, the corresponding author of this paper performed the translation of the informants' verbatim data reported herein and had it double-checked by another experienced translation expert to ensure quality and accuracy.

With the application of the research methods above, the study obtained the following main results.

## **4. Results and Discussion**

### ***4.1. Research Question 1: What Challenges did Engineering-Technology Students Encounter With EMI?***

When English was adopted as a medium of instruction, engineering-technology students at Vietnamese universities encountered the main challenges as follows.

#### **4.1.1. Discipline-Specific Content and Vocabulary-Related Challenges**

EMI presented many challenges related to discipline-specific content and vocabulary to engineering-technology students as shown in Table 1 below (the numbers move from 1 - strongly disagree to 5 - strongly agree).

**Table 1***Discipline-Specific Content and Vocabulary-Related Challenges*

	1	2	3	4	5
1. Disciplinary content is difficult to absorb in Vietnamese, even more difficult when it comes to English.	0% (0)	3.8% (11)	4.9% (14)	29.5% (85)	61.8% (178)
2. Disciplinary terms are difficult to understand.	0% (0)	3.1% (9)	3.5% (10)	36.8% (106)	56.6% (163)

Regarding the content of disciplinary subjects, the majority of students (91.3%, n = 263) admitted that when studying in English, the disciplinary content was harder to absorb than when it was taught in Vietnamese. Similarly, 93.4% of students (n = 269) considered disciplinary terms to be a big challenge when they studied in English. These challenges can be regarded as the most problematic for engineering-technology students. The students' narrative journals reveal that the difficulties in understanding discipline-specific content and vocabulary can lead to other challenges in reading comprehension and academic writing.

Firstly, it seems that all students participating in the qualitative phase had difficulty understanding English documents because of their weak disciplinary lexicon. This finding is consistent with those of other researchers around the world (Cheng, 2010; Evans & Green, 2007; Shen, 2013), in which vocabulary is identified as the leading hindrance to students' comprehension of English texts. It is strongly confirmed in the interview phase. For example, a student shared, "*Sometimes I have a problem while reading a document. I don't understand all the words*" [S16]. Another student explained more specifically, "*I have a lot of difficulties - mostly the vocabulary of the lessons because each lesson has a different topic*" [S2]. It is obvious that most students had problems with technical terms related to their majors. Undoubtedly, knowledge of terminology and familiarity with discipline-

specific conventions are of vital importance for engineering-technology students to address their academic issues (Swales, 1990). A student described his experience with technical terms as follows, "*I have no problem with English except for some new technical terms in computer engineering major. My writing, reading, speaking and listening are good*" [S23]. In their journals, students repeatedly emphasized the importance of teaching academic terms to them in basic and academic English courses so that they could familiarize themselves with discipline-specific terms. This is illustrated in the following journal citation, "*There are difficulties related to textbooks and majors. Technical textbooks are written in a very complex technical language and sometimes I find it difficult to understand them. Moreover, some disciplinary subjects are too complex to understand in English*" [S25].

Another significant difficulty for students is understanding the content of long reading texts. Engineering-technology students are often required to read machine-related instructions, and many interviewees (n = 21) reported that they found it hard to understand the content of long reading texts. A student admitted, "*Sometimes I read materials from the Internet and I find it difficult because it is often too long and not specific*" [S9]. Meanwhile, another student explained in his/her journal:

Honestly, when I search online and I find a long text, I usually don't read



it. I try to find a text written on the main points. When the text is divided into several points, it becomes easier for us. But when it's a long paragraph, I find it hard to read. [S11]

Besides, discipline-specific content and vocabulary-related challenges also lead to students' difficulties in completing writing exercises to meet requirements. Among 27 students interviewed, 21 mentioned that one aspect of academic writing they encountered with EMI is how to express ideas in English. They explained that the reason for this also originated from the lack of disciplinary terms. This finding was partly explained in the interview section as quoted below.

There are many difficult problems that I personally encounter when using English in class, that is: how to write a sentence correctly, how to express it in English ... I feel I have a lot of ideas but how to express them in English is a challenge to me. I also had some difficulties remembering and understanding academic vocabulary related to the subject. [S12]

Other difficulties related to writing skills resulted from their weak knowledge of discipline-specific content. For example, one student pointed out that laboratory reports proved particularly difficult for them.

**Table 2**

*In-Class Speaking and Discussion-Related Challenges*

	1	2	3	4	5
3. Having difficulty asking questions and participating in class discussions.	2.1% (6)	17.4% (50)	5.9% (17)	56.6% (163)	18% (52)

As the table shows, 74.6% (n=215) participants reported that they found it hard to raise questions as well as join class

I have problems writing lab reports such as how to create a report outline, how to write an introduction and a conclusion, and how to analyze and synthesize information. Technology is a major that contains both theory and practice. I have no problems with the practical part, only having difficulty with the content of the theory part. [S13]

The stories above show that students encountered challenges in writing lab reports, not just general reports. They often had difficulty understanding the content of the theoretical part, and struggled to structure their reports, especially the introduction and conclusion. Not only did they have problems with writing conventions, but they also found it hard to deal with the cognitive aspects of tasks, the analysis and synthesis of non-textual information for their reports.

In summary, both the quantitative and qualitative data revealed several challenges faced by engineering-technology students, which led to their difficulties in understanding the disciplinary content and technical vocabulary, and ultimately affected their academic writing.

**4.1.2. In-Class Speaking and Discussion-Related Challenges**

Engineering-technology students in Vietnam suffer from problems communicating in English as seen in Table 2 below.

discussions. This challenge was elaborated in the interview; students rarely participated in class discussions because they were afraid

they might lose face when making awkward oral performances in front of the class:

The most difficult problem I have is speaking English and especially communicating in English with the teacher. In addition, we find that technical words have different meanings depending on the context. I have problems using certain vocabulary in the right context to convey meaning or instructions. I find it difficult to participate in class discussions in English or to argue with a teacher or friends in English. [S22]

It can be seen that communicating with teachers in English is problematic for many students. Again, the lack of disciplinary terms is mentioned as the main reason for students' hesitance in academic discussions with their teachers and friends, and they felt unconfident to speak in front of their class:

There are many problems and difficulties that I personally encountered with English, such as how to express ideas in English ... I feel that I have ideas but how to express them is a great challenge. In addition, I also struggled with pronunciation and understanding of some academic vocabulary related to technology. [S11]

... in general, I have problems communicating with other people in English. I feel that I am not confident enough to speak English in front of others, I feel embarrassed to do so. Secondly, I don't want to make mistakes in front of everyone because I can become a joke for them and a major problem that makes my speaking difficult is the lack of vocabulary. [S27]

Besides, students pointed out the lack of opportunity to practice English, "When I tried to talk to friends in class in

English, they only answered in Vietnamese and this could be one of the difficulties that I personally encountered in class" [S5]. Obviously, the fear of losing face due to possible mistakes led to students' English avoidance as a coping strategy, and Vietnamese was used instead, which is natural as students tend to switch to their mother tongue to express what they cannot say in English.

Asking teachers for more explanation or clarification when they did not understand is another act frequently avoided by Vietnamese students, possibly because they were afraid to interrupt or annoy teachers (who may think, or utter "Oh my God! I have explained so laboriously till my voice gives out, and you still refuse to understand. You're so dumb! [our assumption], and in most cases, they would ask friends in their class first. These students explained, "*We often don't have enough time because then teachers need to take time to explain again*"; "*When teachers ask us if we understand or not, we simply say that we understand because we think that once or twice does not make any difference; if you get it, you get it right the first time*" [S20]; "*We do not have the habit of giving teachers questions, not because it is in English class. Even during lessons in Vietnamese, we never ask questions*" [S19]. Obviously, it will take much longer time for these students to reduce their reluctance, give more questions to teachers, get more engaged in class activities and eventually build up their confidence in communication.

#### 4.1.3. Listening Challenges

Although EMI may be an effective way to improve students' language proficiency through the use of English to gain discipline-specific knowledge (Joe & Lee, 2013), challenges to students in general and to engineering-technology students in particular involves their poor listening skill when lectures are given in English, as seen in Table 3 below.

**Table 3***EMI Lecture Comprehension-Related Challenges*

	1	2	3	4	5
4. Inability to understand EMI lectures is due to poor listening skill.	10.4% (30)	29.2% (84)	11.1% (32)	35.1% (101)	14.2% (41)
5. The teacher speaks quickly and uses difficult words.	9.4% (27)	34% (98)	4.9% (14)	38.2% (110)	13.5% (39)

Firstly, the results of the questionnaire showed that 49.3% (n = 142) students agreed with the statement that “Inability to understand EMI lectures is due to poor listening skill”. This was reaffirmed in the qualitative phase; students found it hard to understand lectures at all levels of study (from year 1 to year 4) although this problem is more serious for first-year students than the others due to naturally different levels of their listening skills, as concluded by various authors (e.g., van Wyk, 2014; Kagwesage, 2012 in South Africa; Evans & Morrison, 2011 in China; Cheng, 2010 in Taiwan; Al-Bakri, 2014; Al-Mashikhi et al., 2014; Sivaraman et al., 2014 in Oman). Some interviewees said they could only understand the main parts of a topic, but did not understand the details. Some related the difficulties to their previous learning experience:

English is a big challenge to me because we study all the subjects in Vietnamese in high school. Moreover, the type of English that we learn in high school differs from the kind of English we study at university. English in university is academic and complex. In high schools, we learn general English and the words used are very simple. [S5]

Secondly, most interviewees claimed that besides their own language ability, teacher is also a factor that affects their lecture comprehension. In the survey,

approximately half of the students (51.7%; n = 149) agreed that they did not understand lectures because the teacher spoke quickly and used many difficult words. A computer-engineering student confided, “I have encountered many challenges with academic English and concepts related to computing. Some teachers speak a bit too fast when they teach us, and sometimes it is difficult for us to understand what they are saying” [S14]. Another student described his difficulties in understanding lectures as follows:

I have difficulty understanding the content of the lecture. Sometimes I find it difficult to take notes in class because some teachers use difficult and highly academic language. Sometimes I try to record the lecture to listen to it later. [S6]

In sum, EMI prevents students from understanding discipline-specific lectures. These problems exist for a number of reasons related to the teaching style of the lecturers, such as their speed, voice, etc., as well as the students' poor language ability, including their lack of technical vocabulary and inadequate listening skill.

#### **4.2. Research Question 2: What Suggestions did Engineering-Technology Students Propose to Overcome These Challenges?**

Having identified their EMI-related challenges, engineering-technology students proposed several recommendations, such as those in Table 4 below.

**Table 4***Suggestions from Engineering-Technology Students*

	1	2	3	4	5
6. Integrating critical thinking, problem solving, and time management skills into language courses.	0%	0%	2.4% (7)	46.5% (134)	51.1% (147)
7. More attention to learning English at high school.	0%	0%	3.8% (11)	41.3% (119)	54.9% (158)
8. Adopting a bilingual technical education system (in Vietnamese and English).	0%	23.6% (68)	13.2% (38)	41.3% (119)	21.9% (63)
9. Disciplinary teachers should have a good command of English.	0%	0%	0%	42% (121)	58% (167)

#### 4.2.1. Blending Higher-Order Thinking Skills Into Language Courses

97.6% (n = 281) students agreed that it is necessary to integrate critical thinking, problem solving, and time management skills into language courses. Higher-order thinking skills have become a major issue in modern education because they contain promising opportunities for individuals and society (Fleming et al., 1995). Higher-order thinking skills play an important role for students, especially students majoring in engineering and technology. Such skills include self-regulating, analyzing, synthesizing, identifying information sources, reflecting, drawing conclusions based on evidence, amongst others (Linn, 2000; Resnick, 1987), which can help them overcome EMI-related challenges, develop and build their intellectual capacity. Moreover, engineering students need higher-order thinking and problem-solving skills to solve technical issues and strengthen their understanding of discipline-specific content. Meanwhile, critical thinking helps them to reflect on the learning process by asking questions, explaining, analyzing and evaluating other people's ideas (Shaheen, 2012), and this awareness was acknowledged by participants in the study, e.g. *“There should be courses to help*

*students acquire problem-solving and critical thinking skills”* [S27].

#### 4.2.2. More Attention to Learning English at High School

In the interviews and journals, many students shared the same idea that reforms should start from high school so that students can have a solid English background when entering university. For example, one student stated, *“I think that English should be attached more importance in high schools so that students can improve all the four skills of listening, speaking, reading and writing. This will be helpful for students when entering university”* [S2]. Such reforms may include replacing the traditional teaching methods that focus primarily on grammar. From students' suggestions, CLT (communicative language teaching) should be applied instead so as to help students gain sufficient basic English skills before approaching subject matter content and its specific terminology in their undergraduate courses, especially EMI courses.

#### 4.2.3. Adopting a Bilingual Technical Education System (Using Both English and Vietnamese)

In the questionnaires, 63.2% (n = 182) students said that there should be a bilingual technical education system, in both

Vietnamese and English. This statement was confirmed again in the interviews. In students' view, such bilingual instructions may take the following forms:

I recommend having two textbooks for each major subject. One is in Vietnamese and the other is in English. Students who find it difficult to understand knowledge in English can choose the Vietnamese book. This will help us study our major subjects effectively. [S9]

I want my university to teach some subjects in Vietnamese so that teachers can explain knowledge in Vietnamese in case we do not understand some points in English. [S4]

I don't know if this is possible but some subjects should be taught in Vietnamese. [S6]

S13 suggested that universities should establish a center to help students understand the subjects in Vietnamese. Students who have difficulties in learning can go there to ask questions in Vietnamese and teachers can provide them with clear explanations in Vietnamese. If students do not know certain English terms, teachers or the center staff can provide their Vietnamese equivalents. Undoubtedly, apart from English, the use of Vietnamese, which is the students' native language, is believed to help them gain a deeper understanding. In my own teaching experience several years ago, such bilingual instructions were used: I talked to students in English, and stopped after each key point to give them a Vietnamese summary, some further explanation in Vietnamese, and Vietnamese equivalents of key English technical terms. This means EMI courses should not be solely in English; both English and Vietnamese, or students' native language in general, should be used alternately at proper times to ensure understanding. This view

coincides with those expressed by participants in the studies of Ellili-Cherif and Alkhateeb (2015) in Qatar, Ismail (2011) and Al-Mashikhi et al. (2014) in Oman.

There are additional views from participants in the study as well. During the interviews, S19 suggested that English clubs and forums should be set up to help students practice English regularly. English textbooks should be reviewed and updated regularly based on needs analysis to meet the demand of students and the job market. Moreover, students should be encouraged to speak English to each other and to their teachers instead of using Vietnamese. It can be seen that S19 is very critical of the use of Vietnamese in the classroom, probably because of his relatively high level of English proficiency. In another case, S2 is the only participant who believes that universities should invite native English-speaking teachers to teach disciplinary subjects. S2 feels that if teachers are all native English speakers, students will have no choice but to study hard to understand what teachers are teaching. In S2's opinion, the key to improve students' English proficiency is through a monolingual teaching method that uses English only in the classroom. This view has been supported by some researchers such as Ismail (2012), and Al-Bakri (2014). Possibly, this view originated from students' dissatisfaction with Vietnamese disciplinary teachers' English proficiency, as can be inferred from recommendation (9) in Table 4. In both the questionnaires and interviews, all participants agreed that disciplinary teachers need to have adequate English proficiency, and their teaching methods should be improved, e.g. *“Teachers should change their teaching methods. They should be more flexible and make learning less stressful for students”* [S10], *“Discipline-specific teachers should be carefully selected and a high level of English must be one of the requirements for them to become teachers in*

*the English curriculum*” [S14]. Apparently, the quality of EMI teachers, including their English proficiency, is still below students’ satisfaction while teaching in an EMI program requires high language proficiency to help students overcome language-related challenges. Students also emphasized that disciplinary teachers should be trained on how to teach courses in English, “*Technical teachers need to be trained in technical instruction in English, and they need to help students improve their English skills, not just technical knowledge*” [S15]. Nevertheless, EMI teacher training is only offered at a tiny number of teacher educational institutions in the country, and such training is far from satisfactory as well, as the on-going study by Lam & Le uncovers. Also, it is suggested that technical teachers need to be aware that developing students’ language proficiency and helping students deal with language-related issues must be the responsibility of both language teachers and technical teachers (Airey, 2012; Barnard, 2015; Chapple, 2015).

Thus, it can be seen that the proposal for a bilingual technical education program is still controversial among the participants. While some students believe that English and Vietnamese should be used in parallel, others support the notion that English should be the only medium in the classroom. Therefore, it is important to consider students’ voice in any educational policies because these not only affect what students learn and how they learn, but also have an impact on their future life.

## 5. Conclusion

This research was conducted with all students majoring in engineering and technology from different universities in Vietnam where English is used as a medium of instruction. Both qualitative and quantitative methods were adopted through questionnaires, in-depth semi-structured

interviews, narratives and journals. These mixed methods allowed the researchers to combine their strengths to improve the reliability and validity of the data. The findings show that major challenges to EMI students include discipline-specific content and vocabulary, in-class speaking and discussion, and EMI lecture comprehension. These challenges are mostly attributed to students’ poor language ability, such as their lack of technical vocabulary and inappropriate listening skill. As the results reveal, Vietnamese students are not much different from others; they all suffer from almost the same difficulties, as shown in the studies by Kim and Sohn (2009), Airey and Linder (2007), Collins (2010), and Byun et al. (2011). Although seven years has elapsed, the situation in Asian countries, including Vietnam, identified by Dearden (2014), has not significantly ameliorated.

To make matters worse, not all the Vietnamese teachers of English and subject matter teachers who taught or are teaching the students in the study have adequate English proficiency or effective pedagogical skills and teaching styles. Their speaking speed, their voice, their communicative competence, amongst others, have not met these students’ expectations. Definitely, improvement on the part of the teachers is imperative. Furthermore, engineering-technology students need higher-order thinking and problem-solving skills to solve technical issues and strengthen their understanding of their disciplinary content, so it is necessary to integrate higher-order thinking skills into language courses. Besides, reforms should start at high school level so that students acquire a solid foundation of English, or reach a threshold level of English proficiency before starting their EMI courses at university. This is also one among the goals that the [Vietnamese] National Foreign Languages (NFL) Project is yet to achieve (The Prime Minister of Vietnam, 2017). Lastly, students believed

that bilingual technical education, or translanguaging, should be applied, such as designing two major textbooks, one in Vietnamese and one in English to facilitate students' understanding.

This study inevitably has certain shortcomings because it merely focuses on students' perspective to their own learning experience when English is used as a medium of instruction. However, it is undeniable that this is a relatively new, practical approach that contributes to raising students' awareness so that the most effective teaching/learning methods to achieve the dual goals of improving both their disciplinary knowledge and their English proficiency can be found. Another limitation is that we have not considered non-language-related challenges that students may face that affect their experience and learning outcomes. Considering such non-language challenges can help us better understand the difficulties and challenges faced by students when English is used as the means of instruction. In this study, we only focus on the engineering-technology sector rather than other subjects taught by English in universities in Vietnam. A study of a more interdisciplinary nature, including disciplines such as business, humanities and so on could provide deeper insights into students' learning experiences while studying in English. This will provide a more comprehensive picture of the learning experience with EMI in the context of English as a Foreign Language (EFL).

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**Appendix A – Questionnaire**

(Please note that this is only a part of a longer questionnaire for the whole project; and this part is directly relevant to the content of the present article.)

**Part 1: Personal information**

- 1. Age: .....
- 2. Gender:    Male                          Female
- 3. University: .....                      4. Faculty/ Major: .....
- 5. Which year? .....

**Part 2:**

Please read the statements on the following pages and circle the number which best reflects your learning experience in this college. There are no right/wrong answers. The numbers 1 2 3 4 5 refer to the following responses:

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

***Challenges engineering-technology students encountered with EMI***

- 1. Disciplinary content is difficult to absorb in Vietnamese, even more difficult when it comes to English.

---
- 2. Disciplinary terms are difficult to understand.

---
- 3. Having difficulty asking questions and participating in class discussions.

---
- 4. Inability to understand EMI lectures due to poor listening skill.

---
- 5. Teachers speak quickly and use difficult words.

---

***Suggestions engineering-technology students proposed to overcome challenges***

- 6. Integrating critical thinking, problem solving, and time management skills into language courses.

---
- 7. More attention to English at high school.

---
- 8. Adopting a bilingual technical education system (in Vietnamese and English)

---
- 9. Disciplinary teachers having a good command of English.

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***Thank you for completing the questionnaire!***

**I hope you will participate in the interview phase of the research. Please provide contact details below if you agree to participate in the interview.**

Name: .....

Mobile number: .....

Email: .....

## Appendix B - Interview

### A. Introductory questions

1. Can you introduce yourself, please?
2. What is your major?
3. How long have you studied your majors through English as a medium of instruction?

### B. Challenges engineering-technology students encountered with EMI and suggestions

1. What major difficulties have you encountered with EMI? Please specify the challenges you encountered in the following aspects:
  - a. Subject matter content, content acquisition in Vietnamese / English;
  - b. English: disciplinary vocabulary / terms; Speaking, Listening, Reading and Writing Skills;
  - c. EMI teachers;
  - d. Other difficulties;
  - e. Which is the biggest difficulty? Why?
2. Your suggestions to overcome difficulties when English is used as a medium of instruction!

## Appendix C

### Profiles of Participants

University	Faculty/ Major	Level	Number of students
University of Transport and Communications	Faculty of International Education – Construction Economics	Fourth year	23
Military Technical Academy	Control Engineering and Automation – Biomedical engineering	Third year	24
Hanoi Architectural University	Regional and Urban Planning Engineering	Third year	22
FPT University	Graphic Design Engineering	Third year	18
Hanoi University of Science	Land Management Engineering – Natural Resources and Environment	First year	25
Hanoi University of Natural Resources and Environment	Information Technology	Third year	20
	Environmental Technology Engineering		18
National Economics University	Computer Science	Third year	19
	Mathematical Economics		17
Banking Academy	Management Information System	Second year	18
University of Engineering and Technology, VNU	Computer Science	Second year	41
	Telecommunication – Electronics Engineering Technology		
Academy of Finance	Financial Accounting Information Technology	Second year	25
Vietnam University of Commerce	E-commerce	Third year	18
	Mathematical Economics		19

**Appendix D**  
**Profiles of Participants in Qualitative Phase**

No	Gender	University	Faculty/ Major	Level
S1	Female	University of Transport and Communications	Faculty of International Education – Construction Economics	Fourth year
S2	Female	University of Transport and Communications	Faculty of International Education – Construction Economics	Fourth year
S3	Male	University of Transport and Communications	Faculty of International Education – Construction Economics	Fourth year
S4	Female	Military Technical Academy	Control Engineering and Automation – Biomedical engineering	Third year
S5	Male	Military Technical Academy	Control Engineering and Automation – Biomedical engineering	Third year
S6	Female	Hanoi Architectural University	Regional and Urban Planning Engineering	Third year
S7	Male	FPT University	Graphic Design Engineering	Third year
S8	Male	FPT University	Graphic Design Engineering	Third year
S9	Male	Hanoi University of Science	Land Management Engineering – Natural Resources and Environment	First year
S10	Male	Hanoi University of Natural Resources and Environment	Information Technology	Third year
S11	Male	Hanoi University of Natural Resources and Environment	Environmental Technology Engineering	Third year
S12	Female	National Economics University	Mathematical Economics	Third year
S13	Male	National Economics University	Computer Science	Third year
S14	Male	Banking Academy	Financial Accounting Information Technology	Third year
S15	Female	Banking Academy	CityU Program	Second year
S16	Male	Banking Academy	Management Information System	Third year
S17	Female	Academy of Finance	Financial Accounting Information Technology	Fourth year
S18	Male	Academy of Finance	Financial Accounting Information Technology	Second year
S19	Female	Academy of Finance	Financial Accounting Information Technology	Second year
S20	Female	Academy of Finance	Financial Accounting Information Technology	Second year
S21	Male	Vietnam University of Commerce	E-commerce	Third year

S22	Male	Vietnam University of Commerce	Mathematical Economics	Third year
S23	Male	Vietnam University of Commerce	Mathematical Economics	Third year
S24	Female	University of Engineering and Technology, VNU	Computer Science	Third year
S25	Male	University of Engineering and Technology, VNU	Computer Science	Second year
S26	Female	University of Engineering and Technology, VNU	Telecommunication – Electronics Engineering Technology	Second year
S27	Male	University of Engineering and Technology, VNU	Telecommunication – Electronics Engineering Technology	First year

## SỬ DỤNG TIẾNG ANH LÀM NGÔN NGỮ DẠY-HỌC CHO SINH VIÊN KHỐI NGÀNH CÔNG NGHỆ-KỸ THUẬT TẠI VIỆT NAM: THÁCH THỨC & ĐỀ XUẤT

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**Tóm tắt:** Bài viết làm sáng tỏ những thách thức khi tiếng Anh được sử dụng làm ngôn ngữ dạy-học (EMI) theo góc nhìn của sinh viên khối ngành công nghệ-kỹ thuật ở nhiều trường đại học Việt Nam, nơi EMI đang được sử dụng phổ biến. Tổng cộng 307 phiếu câu hỏi đã được gửi đi và phản hồi, trong đó 288 phiếu trả lời hợp lệ và 27 nghiệm viên được lựa chọn để phỏng vấn sâu. Dữ liệu từ phiếu câu hỏi và phỏng vấn được đưa vào phân tích cùng thông tin thu được từ nhật ký của nghiệm viên. Kết quả cho thấy sinh viên khối ngành công nghệ-kỹ thuật Việt Nam gặp rất nhiều khó khăn khác nhau do EMI, chủ yếu là về nội dung và từ ngữ chuyên ngành. Những sinh viên này đề xuất nhiều giải pháp, trong đó có việc giảng viên EMI cần sử dụng cả tiếng Việt và tiếng Anh chứ không chỉ dùng hoàn toàn tiếng Anh trong các lớp EMI. Hy vọng nhận thức của người học về những khó khăn họ gặp phải và đề xuất của chính họ để đối phó với những khó khăn đó sẽ giúp các bên liên quan có những điều chỉnh phù hợp trong phương pháp và nội dung giảng dạy. Đó là thông điệp chính mà nghiên cứu của chúng tôi muốn truyền tải.

**Từ khóa:** sử dụng tiếng Anh làm ngôn ngữ dạy-học (EMI), tiếng Anh chuyên ngành (ESP), kỹ thuật, công nghệ, Việt Nam