Disciplinary Disparity and Attitudinal Differences Towards English as a Medium of Instruction: Voices of Students[1,2]

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Abstract

Situated against the increasingly popular role of English and the internationalization of higher education, English as a medium of instruction (EMI) has become an observable phenomenon in Vietnamese tertiary education. However, there is still a dearth of studies looking at how EMI is viewed and understood by students from different disciplines. This study aims to investigate the attitude of university students majoring in natural sciences and social sciences towards EMI. By exploring the students' attitudes towards EMI, the study attempts to explain the challenges they encountered. Data were collected using questionnaires administered to 215 university students, including a group of 103 natural science students and another group of 112 social science students. The data highlight significant attitudinal differences between these two groups of students. Those majoring in natural sciences were recognizably satisfied with more obviously-defined learning intentions in EMI classes, whereas those majoring in social sciences were more concerned about their levels of concrete achievement in English proficiency. Based on the study findings, it is implied that lecturers should develop an informed EMI pedagogical competence and assist students in developing discipline-relevant EMI learning strategies.

Resumen

Frente al papel cada vez más popular del inglés y la internacionalización de la educación superior, el inglés como medio de instrucción (EMI) se ha convertido en un fenómeno observable en la educación terciaria vietnamita. Sin embargo, todavía hay una escasez de estudios que analicen cómo los estudiantes de diferentes disciplinas ven y entienden EMI. Este estudio tiene como objetivo investigar la actitud de los estudiantes universitarios de las carreras de ciencias naturales y ciencias sociales hacia la EMI. Al explorar las actitudes de los estudiantes hacia EMI, el estudio intenta explicar los desafíos que encontraron. Los datos se recopilaron mediante cuestionarios administrados a 215 estudiantes universitarios, incluido un grupo de 103 estudiantes de ciencias naturales y otro grupo de 112 estudiantes de ciencias sociales. Los datos destacan diferencias de actitud significativas entre estos dos grupos de estudiantes. Los que se especializaron en ciencias naturales estaban claramente satisfechos con las intenciones de aprendizaje claramente definidas en las clases de EMI, mientras que los que se especializaron en ciencias sociales estaban más preocupados por sus niveles de logros concretos en el dominio del inglés. Según los hallazgos del estudio, se da a entender que los profesores deben desarrollar una competencia pedagógica de EMI informada y ayudar a los estudiantes a desarrollar estrategias de aprendizaje de EMI relevantes para la disciplina.

Introduction

The twenty-first century has witnessed an exponential growth in the use of English in higher education institutions (HEIs) across the globe (Dafouz & Smit, 2020). That is to say, English has contributed significantly to fostering student and staff mobility, international collaboration and networking, as well as university rankings. The ever-increasing role of English is closely linked to the introduction of English-medium instruction (EMI) programs being offered by tertiary institutions.

Simply defined, the acronym EMI refers to the use of English as the medium of instruction. The policy of EMI can therefore be conducted in contexts where English is the first, the second, the third, or a foreign language. However simple as it may look, EMI has been operationalized in various ways, depending on the sociolinguistic settings in which a specific university is located. In other words, what may be considered as a typical EMI program in one educational setting may not be so in another context. One of the most common definitions of EMI is that of Macaro et al. (2018) who described EMI as "the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English" (p. 37). Although this definition excludes the countries of Kachru's (1985) Inner Circle – where English is the native language – and tends to focus more on the Expanding Circle, it fits well with this study scope and hence it is what we mean by EMI in this article.

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In Vietnam, the first EMI programs were established in the 1990s. Since then, the use of the English language as a medium of instruction started gaining its position in the country under the auspices of such governmental policies as those presented in Decision 1400 which is about deploying the "National Foreign Language Project 2020" (Vietnamese Government, 2008). Numerous EMI programs have been established in both public and private universities (Vu & Burns, 2014). These EMI programs in Vietnamese HEIs can be broadly divided into *foreign* and *domestic* programs (Nguyen et al., 2017).

Foreign EMI programs are employed as a result of intellectual cooperation agreements with overseas institutions in terms of academic resources, curriculum, materials, texts, and assessment (Nguyen et al., 2017). There are two subtypes of foreign programs: offshoring and franchising. Offshore programs, known as Joint Programs, are partnerships between local and offshore institutions. The government allows Vietnamese HEIs to legalize Joint Programs to develop transnational education programs (Nguyen & Shillabeer, 2013), aimed at attracting Vietnamese students to enroll in foreign-modeled tertiary programs. Upon completing the Joint Programs, students are awarded qualifications by the overseas universities even though they have not left Vietnam.

The other type of foreign program is called "franchising programs", known locally as "Advanced Programs". They are modified versions of overseas educational programs delivered under an agreement between a Vietnamese university and its offshore partners. The programs are supported by the Ministry of Education and Training (MOET) project for capacity building in HEIs with an aim that by 2020, a Vietnamese HEI will be among the world's 200 leading universities (Nguyen, 2009).

Meanwhile, domestic programs adopting EMI are developed and administered by Vietnamese HEIs. These programs draw on the syllabi, content, materials, and assessment schemes of the overseas programs; yet, they are situated within the structure of the Ministry of Education and Training's HE curriculum framework. They are locally known as "High-Quality Programs", which are relatively affordable in comparison with studying abroad.

Researchers have conducted various studies on the above-mentioned types of programs. These studies emphasized the role of English in EMI policy (Duong & Chua, 2016; Nguyen, 2009), the challenges faced by lecturers and students (Dang et al., 2013; Nguyen et al., 2017; Tran & Nguyen, 2018; Vu & Burns, 2014), or potential impacts of EMI on the society (Manh, 2012; Nguyen et al., 2017). However, there are still few of studies that shed light on the conceptualization and internalization of EMI across different academic disciplines. This paper thus aims to look at (1) how students from contrasting academic disciplines perceive and reflect on their EMI programs and (2) what difficulties students from those disciplines experience in EMI classes.

Students' attitudes towards EMI benefits and challenges

Studies investigating students' attitudes towards the implementation of English as a medium of instruction make up a significant part of the existing literature. It is generally agreed that many students perceive EMI as a tool that provides them with certain educational benefits. For example, improving English proficiency is a frequently mentioned benefit for students attending EMI, either explicitly or implicitly (Chang, 2010; Chapple, 2015; Ljosland, 2011; Macaro & Akincioglu, 2018; Smit, 2010; Yeh, 2014). Employability, or competitiveness in the future job markets, has been cited in a number of studies across contexts as another advantage of attending EMI courses (Hu & Lei, 2014; Kim, 2011; Lueg & Lueg, 2015; Smit, 2010). In some other studies, students perceived that EMI might help them to have a chance to study or work abroad (Macaro & Akincioglu, 2018).

While students expect various positive outcomes for their EMI engagement, at the same time, they face considerable challenges. The bulk of EMI studies has mentioned students' language proficiency as the biggest obstacle for this policy's effectiveness at the classroom level. In many EMI programs, undergraduates, and postgraduates are well aware of their low linguistic proficiency. For instance, according to Cho (2012) and Kim (2011), Korean students complained about their language skills, especially their limited listening skills. Some of these students could comprehend only 60% of their lectures. Meanwhile, Khan (2013) found out that Pakistani postgraduates struggled with speaking English in classrooms, understanding lectures, interpreting reading texts, and writing academically.

In some other contexts, such as China or Taiwan, students found it challenging due to the lack of academic English and discipline-specific language (Chang, 2010; Evans & Morrison, 2011; Hu & Lei, 2014; Lee & Lee, 2018; Tsou, 2017). According to Aizawa and Rose (2018), regardless of their English proficiency, students

may face linguistic challenges in EMI courses. They found that higher-proficiency student participants experienced more specific academic literacy challenges like essay organization skills or technical vocabulary. In contrast, lower-proficiency students mentioned more fundamental language-related challenges such as taking notes, comprehending grammar structures, or understanding lectures. These aforementioned difficulties experienced by students are also in line with the findings revealed by other studies examining EMI from teachers' perspective in some EMI contexts such as Turkey (Basıbek et al., 2014; Macaro et al., 2016), Spain (Doiz et al., 2011), the United Arab Emirates (Rogier, 2012), Sweden (Airey, 2011), Indonesia (Floris, 2014), and Korea (Choi, 2013).

Disciplinary disparity and EMI in higher education

Teachers from different disciplines[6] have their ways of teaching and learning (Hativa & Marincovich, 1995), as each one is associated with a "coherent system of concepts, ideas, theories, etc. that have been created to account for the observed and theoretical phenomena" (Airey, 2009, p. 27) by the individuals involved in that discipline. Specializing in a specific field of study, therefore, is not only acquiring the knowledge connected with a particular topic or a social activity, but also its various aspects, including the specific language used by that discipline, a curriculum, different types of teaching methods, and implicit requirements for students. Neuman et al. (2002) offered a comprehensive framework which classifies academic disciplines into *hard* or *soft* and *pure* or *applied* categories. This way of grouping underlines the necessity to take the varying characteristics into consideration when evaluating a tertiary education program. It hence plays a significant role in understanding students' attitudes towards a specific program.

To begin with, *hard-pure* disciplines, or natural sciences (such as chemistry or physics), refer to the subjects with "a cumulative, atomistic structure, concerned with universals, simplification and a quantitative emphasis" (Neuman et al., 2002, p. 406). With such characteristics, natural science curricula tend to be conceived as "linear and hierarchical" (p. 407) and built based on established facts and demonstrable theories. Therefore, assessment tasks are likely to be in the form of "specific and closely focused examination questions" (p. 408), involving numerical calculation and experimental skills. Courses in *hard-pure* disciplines usually involve large group lectures, class laboratory sessions, fieldwork activities, or seminars on finding the solution to predetermined questions related to the lecture topics. Additionally, slides and other visual forms are adopted as significant teaching tools for *hard-pure* fields.

The opposite of *hard-pure* disciplines is *soft-pure* disciplines, or social sciences and humanities, referring to subjects which help students to develop a critical perspective through open and loose course structures (Neuman et al., 2002). Assessed via essays, short answer papers, verbal presentations, and projects, students have to demonstrate their personal opinion and judgments on debatable issues (Bazerman, 1981). This requirement for social science students is because *soft-pure* areas emphasize intellectual ideas, creativity in thinking, and fluency of expression, aiming to train students to achieve personal growth, become critical readers, and develop their individual interpretation of the world of human experiences (Neuman et al., 2002). Accordingly, *soft-pure* courses are often imparted in the form of small groups, with seminars and web-based discussion groups dealing with controversial issues.

Since each field of study has its characteristics, it is important to investigate whether these differences influence the way students study in an EMI class. Chang (2010) reported that among the student participants of six departments, those from technical fields, namely electrical engineering and information communication, had a lower satisfaction rate compared to students from other disciplines such as finance or business management. This difference in students' satisfaction was because students from technical disciplines tended to dislike learning English and had a lower level of English lecture comprehension. In a larger-scale study with 4,524 students from four disciplines (humanities, law, sciences, and social science) at a Swedish university, Bolton and Kuteeva (2012) found complex patterns of academic English use related to the specific field studied. In sciences, English was used pragmatically by both teachers and students, while in humanities and social science, EMI meant parallel use of Swedish and English. In addition, a greater use of English was found in the science and social sciences faculties than in the humanities and law, which can be explained as being related to the nature of knowledge construction in these disciplines.

In adopting these disciplinary differences in terms of the nature of teaching and learning, it was not intended to overemphasize this simplified viewpoint on academic fields of study. Instead, it was intended to suggest that EMI could be conducted broadly across disciplines. We recognized that there might be different

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[6] Field of study.

assumptions and expectations that could prevent learners of different academic fields from functioning appropriately and effectively in EMI classes. It is, therefore, necessary to examine this relatively under-researched problem to contribute to a better understanding of how students from the two seemingly incompatible academic disciplines understand and view the process of learning when English is used as a medium of instruction.

Methodology

Research locations

This study was conducted at two universities in the center of Vietnam. The students studying natural sciences came from the University of Alpha (a pseudonym). Since 2006, the Ministry of Education and Training of Vietnam (MOET) authorized the University of Alpha to implement an EMI program to train undergraduate students majoring in physics with the advanced curriculum and standard of the University of Virginia, USA. Recently, The University of Alpha also allowed students to enroll in EMI courses for some academic subjects such as maths and chemistry. With regards to those majoring in social sciences, the study was conducted at the University of Beta (also a pseudonym), which has been affiliated with the University of Sydney in Australia to introduce the joint training program in agriculture economics and finance at regional and international levels. Furthermore, the University of Beta has cooperated with the Institute of Technology Tallaght in Ireland in implementing the joint undergraduate training program in business administration.

No.	University	Specialization	Program	Level	Year of establishment	Overseas partner
1	University of Alpha	Advanced Physics (AP)	Advanced Programs	Undergraduate	2006	University of Virginia, USA
		Chemistry (C) Mathematics (M)	High-Quality Programs		2018	None
2	University of Beta	Agricultural Economics and Finance (AEF)	Advanced Programs	Undergraduate	2010	University of Sydney, Australia
		Business Administration (BA)	Joint Programs		2016	Institute of Technology Tallaght, Ireland

Table 1: EMI implementation at two universities

Research participants and their self-reported English proficiency

The research participants included 215 undergraduate students; 103 of whom studied natural sciences, including advanced physics (45 students), chemistry (47 students), and mathematics (11 students), and 112 who majored in social sciences, including business administration (54 students), agriculture economics and finance (58 students). They were all enrolled in EMI programs (Table 1) at the two universities at the time of data collection.

As there was no English screening test for enrollment in these EMI programs, not all participants had officially taken English proficiency tests like IELTS or TOEFL. However, a considerable number of students reported themselves to be at B1 level and above, according to the CEFR six levels of reference[7]. Their reported level of English of proficiency was mainly based on students' awareness of their own English during their participation in English language courses provided by the two universities. This result might not be perfect in terms of self-assessment of English competence, but it demonstrated students' confidence in English skills which could predict their attitudes towards EMI (Bukve, 2018). According to self-reported data, seen in Table 2, while more students majoring in natural sciences claimed to be at CEFR B1 level, those majoring in social sciences reported being at more advanced levels (CEFR B2 and C1).

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[7] The Common European Framework of Reference for Languages (known as CEFR) is the framework which claimed to provide 'a common basis for the elaboration of language syllabuses, curriculum guidelines, examinations, textbooks, etc. across Europe' (Council of Europe, 2001). Its descriptive scheme is generally known through the 'global scale' of language proficiency, including six global levels from the lowest to the highest: A1, A2, B1, B2, C1 and C2.

Reported English level of proficiency	Natural science student	Percentage (N=103)	Social science student	Percentage (N=112)
A1	4	3.8	6	5.3
A2	31	30	35	31.2
B1	57	55.3	47	41.9
B2	9	8.7	13	11.6
C1	2	1.9	3	2.6
C2	0	0	0	0
Others*	0	0	8	7.1

Note: Other*: Students who chose not to report on their level of proficiency

Table 2: Students' self-reported level of English proficiency with reference to the CEFR

Data collection and analysis

Data was collected via an online questionnaire, which consisted of three sections: demographic information, twenty-one closed-ended questions in five clusters regarding students' attitudes toward EMI and challenges they were encountering, and four open-ended questions about students' EMI experience. Twelve of the questions in the survey were partly adapted from the studies of Fernández-Costales (2017) and Yen and Thong (2019). To ensure the validity of the questionnaire, the questions were piloted and reviewed by some EMI teachers and EMI researchers. The reliability for 21 statements in the questionnaire as a whole, calculated using Cronbach's alpha coefficient, was 0.801. More specifically, it is shown in Table 3 that the internal consistency is homogeneous and significant for all the dimensions as the reliability of all clusters ranged from 0.723 to 0.855, exceeding the minimum of 0.70, considered as a reasonably high level of reliability (Dörnyei, 2007)

Clusters	No. of Items	Cronbach's Alpha
Student's perceived benefits of EMI courses	5	0.832
Students' viewpoints on EMI lecturers	5	0.829
Challenges in comprehending lectures	4	0.855
Challenges in participating in classroom discussion	3	0.723
Challenges in understanding textbooks and course materials	4	0.770

Table 3: Cronbach Alpha values for questionnaire clusters

After initial contact to seek approval and support from department heads and lecturers, our surveys were distributed to students with the link to do the survey. At the beginning of the survey, brief information about the study was presented to the participants. If they agreed to participate in the study, they would be requested to click 'confirm' to start the survey. We also sent emails to class monitors to highlight the benefits and importance of the research and asked them to help improve response rates. Despite some limitations due to the COVID-19 pandemic, the online questionnaire served fairly well in collecting relevant data. After being collected data were analyzed using SPSS. Survey results were calculated and represented using both percentage and mean score which was based on a 5-point Likert Scale scoring (ranging from 1 for Strongly Disagree to 5 for Strongly Agree). Meanwhile, open-ended data from the questionnaire were analyzed using thematic analysis wherein recurring themes were identified and labelled.

Findings

Students' perceived benefits of EMI courses: Job-seeking opportunities

As can be seen in Table 4, students highly agreed that studying in an EMI class would be significantly beneficial in terms of activeness and competitiveness (Item 2) as well as vocabulary development, especially those related to subject-specific terminology (Item 5). In other words, students of both majors strongly believed that EMI enhanced their English proficiency (Item 4). However, more social science students than natural science students were satisfied with their ability to express themselves, their thoughts, and their ideas (Item 3). This difference might be associated with the fact that students in social sciences take many courses on social skills, problem-solving skills, analytical and critical thinking skills, or decision making, whereas students majoring in natural sciences spend most of their time working with numeral tasks, experimentation to study matter (physical substance) or mathematics.

Questionnaire item	Disciplines	Strongly disagree/ Disagree (%)	Neutral (%)	Strongly agree/ Agree (%)	M	SD
1. I can easily understand the content of the lectures taught in English.	NS	14.7	54.9	30.4	3.16	0.78
	SS	13.2	42.5	44.3	3.35	0.88
2. Studying in an EMI class makes me more active and competitive.	NS	4.9	10.8	84.3	4.1	0.81
	SS	4.5	27.4	68.1	3.83	0.88
3. Learning in English gives me more freedom to express myself, my thoughts, and ideas.	NS	11.7	38.2	50.1	3.43	0.87
	SS	5.3	27.4	67.3	3.77	0.83
4. EMI classes enhance students' proficiency in English language skills.	NS	6.9	8.8	84.3	4.14	0.87
	SS	2.7	14.2	83.1	4.07	0.71
5. EMI sessions have improved my key vocabulary and subject-specific terminology.	NS	0.0	4.9	95.1	4.34	0.57
	SS	0.9	17.7	81.4	4.08	0.69

Note: NS = natural sciences, SS = social sciences, M = mean score, SD = standard deviation

Table 4: Students' perceived benefits of EMI courses

Students' positive attitude towards EMI, as seen from the closed questions, can also be inferred from the open-ended questions. When being asked about the benefits of EMI courses, the most salient theme in students' answers was related to language-related benefits, such as "opportunities to learn English", "improve English", "motivate me to learn English", "improve listening skills" or "accesss to English resources". However, it should be noted that there are still a few students who could not see the abovementioned benefits. They tended to focus on the problems related to the high tuition fee, their limited language proficiency, and the demanding content of the programmes.

Students' view on EMI lecturers: Simplification versus illustration

Table 5 shows that most participants highly appreciated their lecturers in terms of their English proficiency or teaching methods. Specifically, a high percentage of the students from both natural sciences and social sciences perceived that their lecturers generally had a high level of English (77.5% & 77.9%, respectively, for Item 6). Also, lecturers from both fields got positive comments from students regarding their ability to integrate content and language in lessons delivered (Item 8). However, 82.3% of natural science students agreed that their lecturers could simplify their language and content more to ensure lecture comprehension (Item 7). In comparison, most social science students (89.3%) highly evaluated their lecturers' use of teaching aids to illustrate and facilitate teaching-learning in the classroom (Item 10). This divergence in attitude could reflect the disciplinary differences between natural sciences and social sciences in terms of teaching methodology or could perhaps reflect the difference in the levels of English-language proficiency between the two groups of students.

Questionnaire item	Disciplines	Strongly disagree/ Disagree (%)	Neutral (%)	Strongly agree/ Agree (%)	M	SD
6. Lecturers generally have a high level of English.	NS	2.9	19.6	77.5	4.06	0.79
	SS	7.1	15.0	77.9	4.19	0.99
7. Lecturers simplify language and course content to increase lecture comprehension.	NS	4.0	13.7	82.3	4.03	0.81
	SS	1.8	18.6	79.6	4.15	0.78
8. Lecturers have effective teaching skills in integrating content with language teaching.	NS	4.9	21.6	73.5	3.89	0.81
	SS	3.5	20.4	76.1	4.10	0.84
9. Lecturers create a positive classroom atmosphere to encourage students to converse with one another only in English.	NS	5.9	18.6	75.5	3.91	0.79
	SS	2.7	11.5	85.8	4.28	0.77
10. Lecturers use various teaching devices such as projectors, power points, and videos to make learning more effective and interesting.	NS	9.8	19.6	70.6	3.82	1.00
	SS	1.9	8.8	89.3	4.50	0.73

Note: NS = natural sciences, SS = social sciences, M = mean score, SD = standard deviation

Table 5: Students' reflection on EMI lecturers

In an open-ended survey question about the reason for their enrolment in EMI programs, twenty two students, mainly from social sciences, showed their appreciation of their lecturers. Their lecturers were considered as enthusiastic and dedicated. One student majoring in Agricultural Economics and Finance confided that he found his EMI program beneficial because many of his teachers showed "enthusiasm and dedication in their teaching". A similar acknowledgement of EMI lecturers was also expressed by a student from Business Administration when s/he claimed that the teachers had "good methods of teaching". Meanwhile, another student from Business Administration mentioned:

Although I am not good at English, my lecturers not only help me improve my English ability but motivate me a lot. (A student majoring in BA)

This appreciation of the teachers could be one of the reasons why social science students' agreement level for Item 6 to Item 10 was slightly higher than that of natural science students. Especially, students from both disciplines seemed to keep following their EMI course and lay their trust on the lecturers' encouragement and care (Item 9).

It could be inferred that the fact that EMI lecturers are competent to teach in English and project themselves as dedicated lecturers who can support and encourage learners might be inadequate to be effective in their EMI teaching. In contexts such as the investigated programs where both lecturers and speakers use English as a lingua franca to achieve their disciplinary purposes, the ability to create a positive classroom atmosphere to encourage students to converse with one another in English is of great importance.

Students' views on challenges in EMI knowledge construction process

Questionnaire item	Disciplines	Strongly disagree/ Disagree (%)	Neutral (%)	Strongly agree/ Agree (%)	M	SD
11. I am afraid to ask the lecturer for clarification during the session.	NS	38.2	36.3	25.5	2.84	1.06
	SS	29.2	38.9	31.9	3.04	0.99
12. I have difficulty following lectures and taking notes.	NS	26.5	35.3	38.2	3.11	0.95
	SS	23.0	34.5	42.5	3.23	0.96
13. I have difficulty in understanding lecturers' instructions and explanations in English.	NS	29.4	41.2	29.4	3.01	0.99
	SS	27.5	35.4	37.1	3.07	0.99
14. I have difficulty in understanding new vocabulary and terminology provided in the lectures.	NS	49.0	34.3	16.7	2.62	0.96
	SS	25.6	44.2	30.2	3.00	1.00

Note: NS = natural sciences, SS = social sciences, M = mean score, SD = standard deviation

Table 6: Divergent challenges in comprehending lectures

Table 6 shows several problems regarding students' ability to understand their EMI lectures. The most challenging aspect was keeping up with the lesson and taking notes, with about 38.2% of natural science students and 42.5% of social science students admitting facing this problem (Item 12). Lecturers' instruction and explanations in English were the second most challenging part, with 37.1% of the social science students and 29.4% of the natural science students showing agreement with Item 13. Remarkably, while only 16.7% of natural science students experienced difficulties related to vocabulary and terminology (Item 14), the figure for social science students was much higher (30.2%). Again, this could be closely linked to the different fields of study.

Questionnaire item	Disciplines	Strongly disagree/ Disagree (%)	Neutral (%)	Strongly agree/ Agree (%)	M	SD
15. I am not actively involved in classroom discussions because of my limited English-speaking ability.	NS	32.3	39.2	28.5	2.91	0.99
	SS	34.5	35.4	30.1	2.94	0.98
16. Language barriers impede discussions between lecturers and students.	NS	27.4	35.3	37.3	3.16	1.05
	SS	27.4	28.3	44.3	3.22	1.10
17. I prefer using both English and Vietnamese in group discussions because of my limited English proficiency.	NS	2.9	23.5	73.6	4.02	0.82
	SS	8.9	26.5	64.6	3.81	1.05

Note: NS = natural sciences, SS = social sciences, M = mean score, SD = standard deviation

Table 7: Difficulties in participating in classroom discussion

It is noticeable in Table 7 that a larger number of students from both disciplines agreed that they experienced difficulties in classroom interaction, either with their lecturers or with their classmates. However, in both types of interaction, the figures for natural science students were lower than those for social science students, with 28.5% and 30.1% for classroom discussion (Item 15) and 37.3% and 44.3% for lecturer-students interaction (Item 16), respectively. Meanwhile, nearly three-fourths of students in natural sciences preferred to use both English and Vietnamese in group discussions (Item 17), which was higher than social science students (73.6% vs. 64.6%).

Questionnaire item	Disciplines	Strongly disagree/ Disagree (%)	Neutral (%)	Strongly agree/ Agree (%)	M	SD
18. Textbooks and materials are written at a language level which is not appropriate for the students.	NS	52.0	40.2	7.8	2.5	0.87
	SS	32.8	33.6	33.6	3.01	1.02
19. I spend most of my study time at home looking up new vocabulary and terminology in textbooks.	NS	12.7	31.4	55.9	3.55	0.96
	SS	11.5	31.0	57.5	3.58	0.90
20. It takes me a lot of time to understand the language first and then grasp the learning content.	NS	6.9	24.5	68.6	3.79	0.84
	SS	9.8	24.8	65.4	3.72	0.91
21. I rely on summary notes and translated notes more than on the textbook because of my low proficiency in English.	NS	24.6	38.2	37.2	3.16	0.99
	SS	18.6	38.9	42.5	3.31	1.00

Note: NS = natural sciences, SS = social sciences, M = mean score, SD = standard deviation

Table 8: Divergent challenges in understanding textbooks and course materials

In terms of understanding textbooks and materials, there were some obvious disciplinary differences with regards to Item 18. More than 30% of social science students expressed that the language used in textbooks and learning materials was not suitable for their level. In comparison, the percentage of natural science students was just 7.8%. However, the figures of students from both disciplines seem to be relatively similar in terms of their learning strategies to deal with the linguistic challenge in learning materials. These strategies include looking up new words and terminology at home (Item 19), with 55.9% of the natural science students and 57.5% of the social science students showing agreement. Likewise, as for Item 20, 68.6% of the natural science students and 65.4% of the social science students tried to understand the language first and then absorb the content knowledge later on). Summary notes and translated notes were also used by around 40% of students in both disciplines to make up for the lack of their language proficiency.

Discussion

Most participants in this study agreed that they enrolled in EMI programs because of various benefits, especially those related to job opportunities and English improvement. This finding is in line with previous ones in China (Hu & Lei, 2014), South Korea (Kim, 2011), and Turkey (Macaro & Akincioglu, 2018). During their EMI courses, several participants from both disciplines could seize opportunities to improve their proficiency. They were given chances to express themselves in English to acquire more vocabulary and terminology. With these chances, they became more active and competitive. However, while more social science students felt the freedom to orally express their ideas in English and enhance their proficiency, students majoring in natural sciences felt more satisfied with EMI courses to acquire new knowledge. This contrast in attitude could arise due to their disciplinary differences. Social science subjects could enhance students' abilities to debate perspectives, while natural science subjects could develop a capacity to use accepted scientific viewpoints (Neuman et al., 2002).

In addition, the student participants had an obvious appreciation for their lecturers' English proficiency level. This finding seems to be different from what has been reported in previous studies wherein students expressed remarkable concerns towards their lecturers' inadequate language ability (i.e., Bolton & Kuteeva, 2012; Chang, 2010). They also highly evaluated their lecturers' EMI teaching methods, particularly the creation of classroom atmosphere and the integration of content and language teaching. These factors have been reported in existing studies to play an important role in EMI knowledge construction (Chen, 2017; Ngo, 2019). However, as mentioned earlier, natural sciences are associated with "universals, simplification and a quantitative emphasis" (Neuman et al., p. 406). In contrast, social science students need to develop their personal opinions and judgments on debatable issues (Bazerman, 1981). Therefore, the disciplinary

difference between natural sciences and social sciences in this study could rest on the use of simplification strategies to boost content understanding – which may be more valued by natural science students. Another disciplinary difference is manifested in the employment of various teaching devices such as projectors, *PowerPoint* slides, and videos, a teaching method better rated by social science students. The adoption of these visual aids, functioning as extensive scaffolding tools for students' knowledge construction in English, is also positively evaluated by students in other studies (Hellekjær, 2010; Ngo, 2019; Yeh, 2014).

Finally, the participants reported several challenges in their EMI knowledge construction. A number of students in both disciplines had difficulties in following lectures and taking notes or understanding their lecturers' instruction in English. These concerns have similarly been reported in other EMI settings (Cho, 2012; Khan, 2013; Kim, 2011). When clarification is needed, more than 60% of the participants were not willing to question their lecturers during the class session. These problems in students' comprehension could be linked to the second challenge regarding students' participation in classroom discussion, either with the lecturers or their classmates. Thirdly, many students also found it difficult to read textbooks and resources written in English, as well as to understand the meaning and use their time to learn the content. In all three challenges, it appeared that social science students faced more difficulties than their natural science schoolmates. For example, more social science students had difficulty understanding new vocabulary and terminology or reading English textbooks and learning materials. Looking up new words, therefore, was a burden for the students (Khan, 2013). This recognized difficulty is possibly because the social sciences deal more with essays, verbal presentations, and projects, while natural science curricula tend to be "linear and hierarchical" (Neuman et al., 2002, p. 407).

To cope with these above-mentioned challenges, the participants of both disciplines had their learning strategies, especially the use of both English and Vietnamese in their group discussions, or translanguaging to learn the lesson content (Lewis et al., 2012). This finding adds to the existing collection of evidence that underlines the necessity to shift "the traditional lens of pedagogical monolingualism to a dynamic translanguaging and trans-semiotizing lens" (Lin, 2021, p. vi). In other words, the role of English should be placed in relation to that of other coexisting languages in an EMI setting (Dafouz & Smit, 2016; Ngo, 2019; Smit, 2018). Accordingly, the translingual resources that students bring to their EMI classroom, and in this study to their group discussions, to make meaning and knowledge should be valued (Baker & Tsou, 2021). Additionally, the participants reported having spent time on pre-class reading and looking up new words and terminology or developed their summary notes plus translated notes to grasp the main content of each lesson. These learning strategies are similar to those adopted by students in other contexts like Sweden or China (Airey & Linder, 2006; Hu & Lei, 2014).

Implications and Conclusion

To sum up, this current study has shed some light on natural science and social science students' attitudes towards their EMI courses based on their own learning experience. Overall, students from both disciplines share similar favorable experiences. However, the disciplinary differences can be recognized when it comes to the ability to express ideas and thoughts in English, the understanding of new vocabulary and terminology, the learning strategies, and especially lecturers' teaching methods. The study highlights the necessity of taking into consideration aspects of a disciplinary chasm in adopting EMI in content classes. It should be noticed that students in natural sciences might be prone to certain cognitive features such as good memory and competence in problem-solving. In contrast, social science students need a facility in oral and written expression, with a more pragmatic end in view (Neuman et al., 2002).

Based on these findings, several implications for EMI teacher training programs can be given. First of all, it is of great importance that lecturers should develop their EMI pedagogical competence, as teaching their content subjects in English is not equivalent to the translation of the content from their first language, in this case Vietnamese, to English (Cots, 2013). The creation of a positive classroom atmosphere so as to encourage students' learning, or the employment of visual aids like *PowerPoint* slides or videos, has a considerable impact on students' learning. Especially in social science subjects, these teaching devices enable students with low English proficiency to follow the lectures more effectively. Secondly, lecturers should assist students in developing their own EMI learning strategies, such as guiding them to write effective notes or providing pre-class reading questions. In doing so, students can overcome linguistic obstacles by working hard in their independent learning and catching up with their in-class activities.

The findings and discussion in this study are only based on the data collected via an online questionnaire. In order to shed more light on the research issue, future studies could consider employing classroom observations to see how natural science and social science lecturers deliver their classes and whether what

students perceive about their lecturers' teaching methods corresponds with their lecturers' natural practices in the classroom

References

Airey, J. M. (2009). *Science, language, and literacy: Case studies of learning in Swedish university physics* [Doctoral dissertation, Uppsala University]. DiVA. http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-9547

Airey, J. (2011). Talking about teaching in English: Swedish university lecturers' experiences of changing teaching language. *Iberica,* (22), 35-54. https://revistaiberica.org/index.php/iberica/article/view/317

Airey, J., & Linder, C. (2006). Language and the experience of learning university physics Sweden. *European Journal of Physics, 27*(3), 553-560. https://doi.org/10.1088/0143-0807/27/3/009

Aizawa, I., & Rose, H. (2018). An analysis of Japan's English as medium of instruction initiatives within higher education: The gap between meso-level policy and micro-level practice. *Higher Education*, 77(6), 1125-1142. https://doi.org/10.1007/s10734-018-0323-5

Baker, W., & Tsou, W. (2021). EMI and translanguaging in Asia through the ROAD-MAPPING lens. In W. Baker & W. Tsou (Eds.). *English-medium instruction translanguaging practices in Asia: Theories, frameworks and implementation in higher education* (pp. 183-195). Springer.

Bazerman, C. (1981). What written knowledge does: Three examples of academic discourse. *Philosophy of the Social Sciences*, 11(3), 361–387. https://doi.org/10.1177/004839318101100305

Bolton, K., & Kuteeva, M. (2012). English as an academic language at a Swedish university: Parallel language use and the 'threat' of English. *Journal of Multilingual and Multicultural Development*, 33(5), 429–447. https://doi.org/10.1080/01434632.2012.670241

Bukve, T. (2018). Students' perspectives on English medium instruction: A survey-based study at a Norwegian university. *Nordic Journal of English Studies*, 17(2), 215–242. https://doi.org/10.35360/njes.439

Chang, Y.-Y. (2010). English-medium instruction for subject courses in tertiary education: Reactions from Taiwanese undergraduate students. *Taiwan International ESP Journal, 2*(1), 53-82. https://doi.org/10.6706/TIESPJ.2010.2.1.3

Chapple, J. (2015). Teaching in English is not necessarily the teaching of English. *International Education Studies, 8*(3), 1-13. https://doi.org/10.5539/ies.v8n3p1

Chen, F. (2017). Instructional language use in environmental science classroom. In W. Tsou & S.-M. Kao (Eds.), *English as a medium of instruction in higher education: Implementations and classroom practices in Taiwan* (pp. 57-78). Springer.

Cho, D. W. (2012). English-medium instruction in the university context of Korea: Tradeoff between teaching outcomes and media-initiated university ranking. *The Journal of Asia TEFL, 9*(4), 135-163. http://journal.asiatefl.org/main/main.php

Choi, S. J. (2013). Issues and challenges in offering English-medium instruction: A close examination of the classroom experiences of professors. *Studies in English Language and Literature, 39*(2), 275-306. https://doi.org/10.21559/aellk.2013.39.2.013

Cots, J. M. (2012). Introducing English-medium instruction at the University of Lleida, Spain: Intervention, beliefs, and practices. In A. Doiz, D. Lasagabaster, & J. M. Sierra (Eds.), *English-medium instruction at universities: Global challenges.* (pp. 106- 128). Multilingual Matters.

Council of Europe. (2001). *The common European framework of reference for languages: Learning, teaching, assessment.* Cambridge University Press.

Dafouz, E., & Smit, U. (2016). Towards a dynamic conceptual framework for English-medium education in multilingual university settings. *Applied Linguistics, 37*(3), 397- 415. https://doi.org/10.1093/applin/amu034

Dafouz, E., & Smit, U. (2020). *ROAD-MAPPING English medium education in the internationalised university.* Palgrave Macmillan.

Dang, T. K. A., Nguyen, H. T. M., & Le, T. T. T. (2013). The impacts of globalization on EFL teacher education through English as a medium of instruction: An example from Vietnam. *Current Issues in Language Planning, 14*(1), 52-72. https://doi.org/10.1080/14664208.2013.780321

Doiz, A., Lasagabaster, D., & Sierra, J. M. (2012). Future challenges for English-medium instruction at the tertiary level. In A. Doiz, D. Lasagabaster, & J. M. Sierra (Eds.), *English-medium instruction at universities: Global challenges* (pp. 213–221). Multilingual Matters.

Duong, V. A., & Chua, C. SK. (2016). English as a symbol of internationalization in higher education: A case study of Vietnam. *Higher Education Research and Development*. 35(4), 669–683. https://doi.org/10.1080/07294360.2015.1137876

Evans, S., & Morrison, B. (2011). Meeting the challenges of English-medium higher education: The first-year experience in Hong Kong. *English for Specific Purposes, 30*(3), 198-208. https://doi.org/10.1016/j.esp.2011.01.001

Fernández-Costales, A. (2017). Evaluación de las percepciones del alumnado sobre la utilización del inglés como Lengua de instrucción en la universidad [Assessing students' perceptions regarding English-medium instruction in higher education]. *Didáctica Lengua y Literatura, 29.* https://doi.org/10.5209/DIDA.57129

Floris, F. D. (2014). Learning subject matter through English as the medium of instruction: Students' and teachers' perspectives. *Asian Englishes, 16*(1), 47-59. https://doi.org/10.1080/13488678.2014.884879

Hu, G., & Lei, J. (2014). English-medium instruction in Chinese higher education: A case study. *Higher Education*, 67(5), 551–567. https://doi.org/10.1007/s10734-013-9661-5

Kachru, B. (1985). Standards, codification and sociolinguistic realism: English language in the outer circle. In R. Quirk, R. & H. Widowson (Eds.), *English in the world: Teaching and learning the language and literatures* (p. 11-36). Cambridge University Press.

Khan, H. I. (2013). *An investigation of two universities' postgraduate students and their teachers' perceptions of policy and practice of English medium of instruction (EMI) in Pakistani universities* [Doctoral dissertation, University of Glasgow]. Enlighten Theses. https://theses.gla.ac.uk/4451/1/2013Khanphd2.pdf

Kim, K.-R. (2011). Korean professor and student perceptions of the efficacy of English-medium instruction. *Linguistic Research, 28*(3), 711-741. https://doi.org/10.17250/khisli.28.3.201112.013

Lee, K., & Lee, H. (2018). Korean graduate students' self-perceptions of English skills and needs in an English-medium instruction context. *Multilingual and Multicultural Development*, 39(8), 715 - 728. https://doi.org/10.1080/01434632.2018.1438442

Lewis, G., Jones, B., & Baker, C. (2012). Translanguaging: origins and development from school to street and beyond. *Educational Research and Evaluation*, 18(7), 641–654. https://doi.org/10.1080/13803611.2012.718488

Lin, A. M. Y. (2021). Foreword: Re-focusing on the dynamic meaning-making processes of multilingual teachers and students. In W. Baker & W. Tsou (Eds.). *English-medium instruction translanguaging practices in Asia: Theories, frameworks and implementation in higher education* (pp. v-vi). Springer.

Ljosland, R. (2011). English as an academic lingua franca: Language policies and multilingual practices in a Norwegian university. *Journal of Pragmatics, 43*(4), 991-1004. https://doi.org/10.1016/j.pragma.2010.08.007

Lueg, K., & Lueg, R. (2015). Why do students choose English as a medium of instruction? A Bourdieusian perspective on the study strategies of non-native English speakers. *Academy of Management Learning and Education, 14*(1), 6-30. https://doi.org/10.5465/amle.2013.0009

Macaro, E., & Akincioglu, M. (2018). Turkish university students' perceptions about English medium instruction: Exploring year group, gender and university type as variables. *Journal of Multilingual and Multicultural Development*, *39*(3), 256-270. https://doi.org/10.1080/01434632.2017.1367398

Macaro, E., Curle, S., Pun, J., An, J., & Dearden, J. (2018). A systematic review of English medium instruction in higher education. *Language Teaching, 51*(1), 36-76. https://doi.org/10.1017/S0261444817000350

Manh, L. D. (2012). English as a medium of instruction at tertiary education system in Vietnam. *The Journal of Asia TEFL, 9*(2), 97-122. http://www.asiatefl.org/main/download_pdf.php?i=99&c=1419300205&fn=9_2_05.pdf

Ngo, P. L. H. (2019). *English medium instruction (EMI) in higher education: A case study of an EMI programme in Vietnam* [Doctoral dissertation, University of Southampton]. Eprints Soton. https://eprints.soton.ac.uk/435919

Nguyen, A. T. (2009). *The internationalization of higher education in Vietnam: National policies and institutional implementation at Vietnam National University, Hanoi* [GIARI Working Pater Vol. 2008-E-21]. Global Institute for Asian Regional Integration. http://www.waseda-giari.jp/sysimg/imgs/wp2008-E-21.pdf

Nguyen, G., & Shillabeer, A. (2013). Issues in transnational higher education regulation in Vietnam. *Proceedings of the International Conference on Managing the Asian Century*, 637-644. https://doi.org/10.1007/978-981-4560-61-0_71

Nguyen, H. T., Walkinshaw, I., & Pham, H. H. (2017). EMI programs in a Vietnamese university: Language, pedagogy and policy issues. In B. Fenton-Smith, P. Humphreys, & I. Walkinshaw (Eds) *English medium instruction in higher education in Asia-Pacific* (pp. 37-52). Springer.

Rogier, D. (2012). *The effects of English-medium instruction on language proficiency of students enrolled in higher education in the UAE* [Doctoral Dissertation, University of Exeter], Open Research Exeter. http://hdl.handle.net/10036/4482

Smit, U. (2010). *English as a lingua franca in higher education: A longitudinal study of classroom discourse*. De Gruyter Mouton.

Smit, U. (2017). Beyond monolingualism in higher education: A language policy account. In J. Jenkins, W. Baker, & M. Dewey (Eds.), *The Routledge handbook of English as a lingua franca* (pp. 387-399). Routledge.

Tran, L. T., & Nguyen, H. T. (2018). Internationalisation of higher education in Vietnam through English medium instruction (EMI): Practices, tensions and implications for local language policies. In I. Liyanage (Ed.), *Multilingual Education Yearbook 2018* (pp. 91-106): Springer.

Tsou, W. (2017). Interactional skills in engineering education. In W. Tsou & S.-M. Kao, S.-M. (Eds.), *English as a medium of instruction in higher education: Implementations and classroom practices in Taiwan* (pp. 79-93). Springer.

Vietnam Government. (2008). *Quyết định về việc phê duyệt đề án "Dạy và học ngoại ngữ trong hệ thống giáo dục quốc dân giai đoạn 2008 – 2020"* [Prime minister's decision on the approval of the project "Teaching and learning foreign languages in the national education system, period 2008 – 2020"]. http://www.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?class_id=1&_page=18&mode=detail&document_id=78437

Vu, N. T. T., & Burns, A. (2014). English as a medium of instruction: Challenges for Vietnamese tertiary lecturers. *Journal of Asia TEFL, 11*(3), 1-33. http://www.asiatefl.org/main/download_pdf.php?i=59&c=1412065511&fn=11_3_01.pdf

Yeh, C.-C. (2014). Taiwanese students' experiences and attitudes towards English-medium courses in tertiary education. *RELC Journal, 45*(3), 305-319. https://doi.org/10.1177/0033688214555358

Yen, H. P., & Thong, T. N. (2019). Students' perceptions towards the benefits and drawbacks of EMI classes. *English Language Teaching*, *12* (5). 88-100. https://doi.org/10.5539/elt.v12n5p88