



# Profiling the Dynamics of EMI Effectiveness Factor and Students' EMI Course Satisfaction: The Case of Vietnam and Taiwan

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Article abstract

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# **Profiling the Dynamics of the EMI Effectiveness Factor and Students' EMI Course Satisfaction: The Case of Vietnam and Taiwan**

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## **Abstract**

This study explored the relationships between English as a medium of instruction (EMI) effectiveness factors and students' EMI course satisfaction. In addition, responding to the call for adaptive EMI, it also examined how students and teachers' background characteristics could shape such relationships. Using the convenience sampling method, 821 undergraduate students participated in the survey. The study affirms that three EMI effectiveness factors positively predict student EMI course satisfaction, while characteristics that are related to how students approach learning have the most effect on their satisfaction with EMI courses. These findings also affirm the complexity of student EMI course experiences, when considering both student and teacher demographic and background differences. The moderating effect of English proficiency and prior EMI experience differs significantly among such factors and student satisfaction. This research highlights that a cross-cultural outlook is more influential for Taiwanese students and courses with local teachers, while teaching characteristics are a stronger predictor for male students. The significance of each factor may fluctuate within diverse national contexts and is influenced by students and teacher backgrounds. Understanding and adapting to these contextual nuances will play a key role in elevating overall student satisfaction with EMI courses.

## **Introduction**

English-medium instruction (EMI) has emerged as a powerful educational strategy that transcends borders, providing students from diverse backgrounds with the opportunity to access high-quality academic content in the English language (Aguilar, 2017). This pedagogical approach fosters internationalization, broadening the horizons of higher education, and preparing students for a

globally interconnected world (Jiang et al., 2019). As EMI continues to gain prominence in educational institutions worldwide, it is imperative to assess the factors that influence students' EMI course satisfaction within this context.

Several studies have been conducted to investigate which factors, if any, affect the level of students' EMI course satisfaction. For example, Karakas (2017) addressed student satisfaction with respect to teaching, content teachers' English, institutions, and institutions' English language policies and practices. Chu et al. (2018) revealed that both local and international students expressed satisfaction with the local students' receptiveness to foreign cultures, their proficiency in English communication during classes, course content, and the overall degree of internationalization within the college. Barrios et al. (2022) reveals that while students were satisfied with a Spanish university's EMI program, its lecturers' proficiency fell short of expectations, emphasizing the need for language-focused initiatives. However, in addition to these factors, echoing Le and Tang (2022), this study argued that the EMI context involves many other possible moderating factors, such as student and teacher backgrounds that shape the correlation among these EMI effectiveness factors, as well as student satisfaction in the classroom. These background variables suggest conditions where the EMI effectiveness factors may or may not work better, and thus could shed light on a more detailed picture of the dynamics of the relationship of EMI effectiveness factors and student course satisfaction.

According to Le and Tang's scale, there are three key EMI course effectiveness factors. The first is students' learning characteristics, such as their English proficiency, prior knowledge, and learning involvement, which impact their performance (Kong & Wei, 2019). The second is teachers' teaching characteristics, which involve professional knowledge, English proficiency, and teaching methods, all critical for delivering effective EMI courses and ensuring student satisfaction (Li & Wu, 2017). Another important variable is students' cross-cultural and international outlook development, which reflects their ability to navigate globalized learning environments and develop intercultural skills (Aguilar-Pérez, 2018). These factors were grouped into three dimensions to assess EMI effectiveness (Le & Tang, 2022).

The EMI approach has gained momentum in higher education, particularly in Vietnam and Taiwan, driven by globalization and internationalization trends (Tsou, 2021). While EMI courses are increasing in Vietnamese and Taiwanese universities, students' perception of EMI effectiveness regarding teaching, learning, and cross-cultural development remains underexplored. With the ambition of providing an overview of other aspects of EMI teaching and learning implementation, in terms of multi-group analysis (MGA), this study aims to analyze students' attitudes towards the EMI practices of their schools across the group of student nationalities (Vietnamese vs. Taiwanese), student gender (male versus female), course type (required versus elective), and teacher nationalities (local versus foreign teachers). In other words, this study will answer the following questions:

Q1: Can EMI effectiveness factors (including students' cross-cultural and international outlook development, students' learning characteristics, and teachers' teaching characteristics) predict student EMI course satisfaction in the context of Vietnam and Taiwan?

Q2: Can students' and teachers' demographic characteristics moderate the association between EMI effectiveness factors and student EMI course satisfaction in the context of Vietnam and Taiwan?

In general, the choice of language for instruction in higher education carries profound implications, not only for students' academic success, but, also, for their overall educational

experiences. Understanding the factors that contribute to student EMI course satisfaction is of utmost importance, because it can inform educators and institutions on how to create a more conducive and supportive learning environment within this rapidly evolving academic landscape. Considering the findings of this study, an effort was made to provide recommendations regarding the path that Vietnamese and Taiwanese higher educational institutions should pursue in regard to EMI.

## Literature Review

### *Introduction to EMI and its importance*

English as a medium of instruction (EMI) refers to the educational practice of teaching academic content in English, even in regions where English is not the native language. Over the past few decades, EMI has emerged as a key development in higher education, driven largely by the forces of globalization and internationalization (Helm, 2020). As English continues to solidify its position as the world's academic lingua franca, its use as a medium of instruction has expanded, making EMI a vital component in the global academic landscape (Galloway & Ruegg, 2020).

The growing role of EMI in higher education helps to boost global competitiveness, by attracting international students and expanding academic reach. While EMI research has centred on Europe's well-developed programs, it is also thriving in East and South East Asia, due to supportive national policies (Rose & McKinley, 2018). For instance, China's Ministry of Education mandated a five-to-ten-percent increase in EMI offerings by 2013 (Hu et al., 2014). Japan also invested in EMI through the Global 30 and Top Global University Projects to internationalize its higher education (Rose et al., 2020). Following the trend, Taiwan's "Higher Education Sprout Project" and "2030 Bilingual Country Project" furthered EMI development in higher education (Wang, 2020), while Vietnam's educational reforms, since the early 2000s, have expanded EMI in public and private universities (Tran & Nguyen, 2018).

The global rise of EMI in higher education reflects its value for internationalization, yet program success hinges on student satisfaction. In the following section, this study examines key factors affecting student satisfaction for EMI's continued effectiveness in global higher education.

### *EMI effectiveness factors*

*Teacher teaching characteristics:* The quality of teaching plays a crucial role in EMI courses, impacting student satisfaction and learning outcomes. Teachers must possess not only strong professional knowledge, but also a high level of English proficiency, especially in reading, writing, listening, and speaking (Nguyen et al., 2016). Effective teaching methods, such as fostering classroom discussions and providing timely feedback, contribute to better learning experiences (Jiang et al., 2019). Moreover, the availability of well-structured course materials, updated resources, and relevant content that are tailored to students' needs are all essential for achieving high-quality instruction (Tseng et al., 2018). Teachers are also expected to offer academic counseling and manage class interactions, so as to create a more engaging learning environment (Le & Tang, 2022).

*Student learning characteristics:* Student performance in EMI courses is influenced by their

prior knowledge, English proficiency, and active engagement in learning (Kong & Wei, 2019). Many EMI programs require students to demonstrate their English language ability through standardized tests, like IELTS or TOEFL (Chu et al., 2018). Factors, including students' motivation, learning involvements, and the incentives provided by the course, also shape their overall effectiveness in EMI settings. Those with a stronger background knowledge and more adept English proficiency are likely to perform better and contribute more actively in EMI courses (Le & Tang, 2022).

*Cross-cultural and international outlook development:* EMI programs are designed to promote cross-cultural learning and foster an international outlook among students. Universities are increasingly integrating intercultural competencies into their curricula, in order to prepare students for global challenges (Aguilar Pérez, 2018). Courses often provide opportunities for students to interact with peers from diverse cultural backgrounds, enhancing their intercultural awareness and communication skills (Chu et al., 2018). Research shows that multilingual students tend to have greater intercultural awareness and more positive perspectives on global issues (Tsang, 2022). Additionally, EMI instructors are expected to have a strong, intercultural competence, which is further enhanced through their own international experiences (Gustafsson, 2020). These programs play a key role in developing students' cross-cultural communication skills and international outlook (Le & Tang, 2022).

### ***EMI effectiveness factors and students' EMI course satisfaction***

Reynoso (2010) defines satisfaction as a judgment that a product or service provides, when a pleasurable level of fulfillment related to its consumption is experienced. In higher education, the student-as-customer paradigm views students as the primary customers, whose satisfaction depends on meeting their expectations and perceptions of the institution's performance (Kotler & Clarke, 1986).

The effectiveness of EMI courses can be evaluated from the perspective of students, focusing on key factors that influence their learning experiences and satisfaction. Based on previous studies (Li & Wu, 2017; Ngo et al., 2018; Tseng et al., 2020), Le and Tang (2022) developed a comprehensive effectiveness scale that included three dimensions of 19 items in EMIs courses: teacher teaching characteristics, student learning characteristics, and student cross-cultural and international outlook development. Examples of teacher characteristics include English proficiency in listening, speaking, reading, and writing, as well as effective classroom discussion and feedback skills. Student learning characteristics, such as prior knowledge and involvement in learning, are key factors that determine EMI course effectiveness. The last dimension, student cross-cultural and international outlook development, investigates whether intercultural competency and students' abilities to perform in a globalized environment are emphasized in EMI courses. Since this measurement encompasses relevant factors for EMI effectiveness, the three dimensions could shape students' learning experiences in EMI courses and their EMI course satisfaction. Accordingly, these authors hypothesize that:

H1a: Teacher teaching characteristics are associated with student EMI course satisfaction.

H1b: Student learning characteristics are associated with student EMI course satisfaction.

H1c: Student cross-cultural and international outlook development is associated with student

EMI course satisfaction.

### ***Moderating variables***

*Student English proficiency level:* Alsowat (2016) and Chen et al. (2022) revealed that higher English proficiency leads to better comprehension of course materials, fostering engagement and a positive learning experience. Proficient communicators find ease in interacting with instructors and peers, enhancing the learning environment and contributing to greater satisfaction (Diep et al., 2017). Conversely, lower English proficiency can hinder communication, reducing overall satisfaction (Tratnik et al., 2019). Collaboration is facilitated by advanced proficiency, fostering a positive and inclusive learning community (Alshuraiaan, 2023). Courses adapt more easily to students with higher English proficiency, enhancing their learning experience (Aizawa et al., 2023). Assessments and evaluations reveal a performance advantage for those with this English proficiency, positively contributing to satisfaction (Fisher et al., 2021). Exposure to diverse cultural contexts in EMI courses is navigated more effectively by proficient English speakers, enhancing their learning experiences, while lower proficiency may hinder a full understanding and appreciation of cultural aspects, influencing satisfaction levels (Heugh et al., 2022). Accordingly, this hypothesis was developed:

H2a, b, c: Student's English proficiency level moderates the positive relationship between EMI effectiveness factors (student cross-cultural and international outlook development, student learning characteristics and teacher teaching characteristics) and student EMI course satisfaction.

*Student EMI course experience:* Students with more EMI course experience are likely to respond differently to effectiveness factors than those with less. Students with prior EMI experience may have developed a familiarity with the language and instructional methods, influencing their learning characteristics and cross-cultural understanding (Aguilar-Pérez, 2021; Ismailov et al., 2021). Their expectations and preferences for teaching styles may differ (Barrios et al., 2022), possibly moderating the impact of teacher characteristics on satisfaction. Accordingly, this hypothesis was developed:

H3a, b, c: Prior EMI course experience moderates the relationship between EMI effectiveness factors (cross-cultural outlook, learning characteristics, and teaching characteristics) and student satisfaction.

*Students' nationalities:* Keesing (1974) defines culture as the actions, ideas, and artifacts learned and valued within traditions. In contrast, Masemann (2003) emphasizes culture's multifaceted nature, including mental, social, linguistic, and physical dimensions. Cultural differences in beliefs, behaviours, and practices play a pivotal role in education (Subramanian, 2019). Examining the historical and educational backgrounds of Vietnam and Taiwan, including differences in systems, influences, and teaching approaches {Nguyen, 2008 #298}, could contribute to understanding variations in the association between EMI effectiveness factors and course satisfaction. In addition to cultural differences, disparities in English proficiency between Vietnamese and Taiwanese students (Le & Tang, 2022) also affect their engagement and satisfaction with EMI courses. Investigating cultural values and expectations related to education in both countries can unveil disparities in what constitutes effective teaching and favorable learning characteristics, influencing student satisfaction (Vuong et al., 2021). In addition, considering the societal context, including social norms and expectations regarding education, can further provide

insights into how cultural nuances influence student preferences and satisfaction with specific aspects of EMI courses in Vietnam and Taiwan (Luu et al., 2022). Accordingly, this hypothesis was developed:

H4a, b, c: There are significant differences in the association between EMI effectiveness factors (student cross-cultural and international outlook development, student learning characteristics and teacher teaching characteristics) and students' EMI course satisfaction across Vietnamese and Taiwanese students.

*Students' gender:* This study argues that it is worthwhile investigating gender differences in students' EMI course satisfaction. First, it has been observed that females tend to exhibit greater motivation in language learning (Lasagabaster, 2016), while EMI might serve as a motivator for males by offering a different approach to learning English (Shohamy, 2012). Another reason to consider gender is that in certain cultures where females face societal constraints, they perceive the integrated nature of content and language acquisition as beneficial to their career goals (Macaro & Akincioglu, 2018). Motivation is widely recognized as a critical factor in the learning process (Liu, 2014), because motivated students possess the intrinsic drive to learn, explore possibilities, enhance learning outcomes, and adapt to the demands of the educational environment (Liu, 2014). Consequently, improved performance is often associated with higher levels of student satisfaction with their courses (Zhou & Rose, 2021).

Little research has looked upon gender in EMI courses. Ismail et al. (2011) investigated the attitudes of science and mathematics students in Malaysia, and in general, all students expressed favourable sentiments of EMI, with no discernible disparities between males and females in this regard. In contrast, Hengsadeekul et al. (2014) in Thailand, found that females had significantly higher instrumental goals than males, a finding that they attribute to the possibility that "social support for English-language learning may be understood to reflect career aspirations and social expectations." Santos et al. (2018) also showed that female business students exhibit a more positive attitude than male business students. Based on this literature review, this proposal was developed:

H5a, b, c: There are significant differences in the association between EMI effectiveness factors (student cross-cultural and international outlook development, student learning characteristics and teacher teaching characteristics) and student EMI course satisfaction between female and male students.

*Teachers' nationalities:* To meet the standards of effective EMI instruction, educators are expected to have a comprehensive understanding of the subject matter being taught, and a strong command of English-language abilities, as well as multicultural competency (Inbar-Lourie & Donitsa-Schmidt, 2020). Faculty in EMI programs often come from diverse cultural and linguistic backgrounds and are sourced from various parts of the world (Karakas, 2017). Diversity among EMI teachers, such as whether they are native or non-native English speakers, can potentially influence their teaching methods and language use, in turn, possibly impacting the effectiveness of EMI courses (Ma, 2015).

While the influence of teacher backgrounds, particularly whether for native or non-native English speakers, has received significant attention in the context of general English-language teaching, it remains a relatively under-researched area in the context of EMI teachers. While existing EMI research treats teachers from diverse linguistic and cultural backgrounds as a single cohesive research group (Inbar-Lourie & Donitsa-Schmidt, 2020; Joe & Lee, 2013; Karakas, 2017; Zhang, 2018), how variation in teacher backgrounds, such as foreign or local differences, impact

the effectiveness of EMI instruction remains an open question. Therefore, this research proposes to explore the impact of teacher backgrounds on EMI instruction, specifically examining how the distinction between foreign and local teachers may influence teaching methods, language use, the overall quality of EMI courses, and students' overall satisfaction. Accordingly, this hypothesis was developed:

H6a, b, c: There are significant differences in the association between EMI effectiveness factors (student cross-cultural and international outlook development, student learning characteristics, and teacher teaching characteristics) and differences in student EMI course satisfaction between foreign teachers and local teachers.

*Types of courses:* In college, a required course is a class that students must complete to fulfil their degree program or general education requirements. These courses are essential for graduation, and typically cover core subjects, or major-specific content. On the other hand, an elective course is optional, and gives students the flexibility to choose classes outside their required curriculum. Since electives allow students to explore other areas of interest, or deepen their knowledge in specific subjects that students wish to, those enrolled in elective courses are likely to be more engaged with an elective course, than in required courses (Hallam et al., 2017).

In this study, it is proposed that:

H7a, b, c: There are significant differences in the association between EMI effectiveness factors (student cross-cultural and international outlook development, student learning characteristics and teacher teaching characteristics) and student EMI course satisfaction between required (compulsory) and elective EMI courses.

This study proposed the research conceptual framework shown in Figure 1.

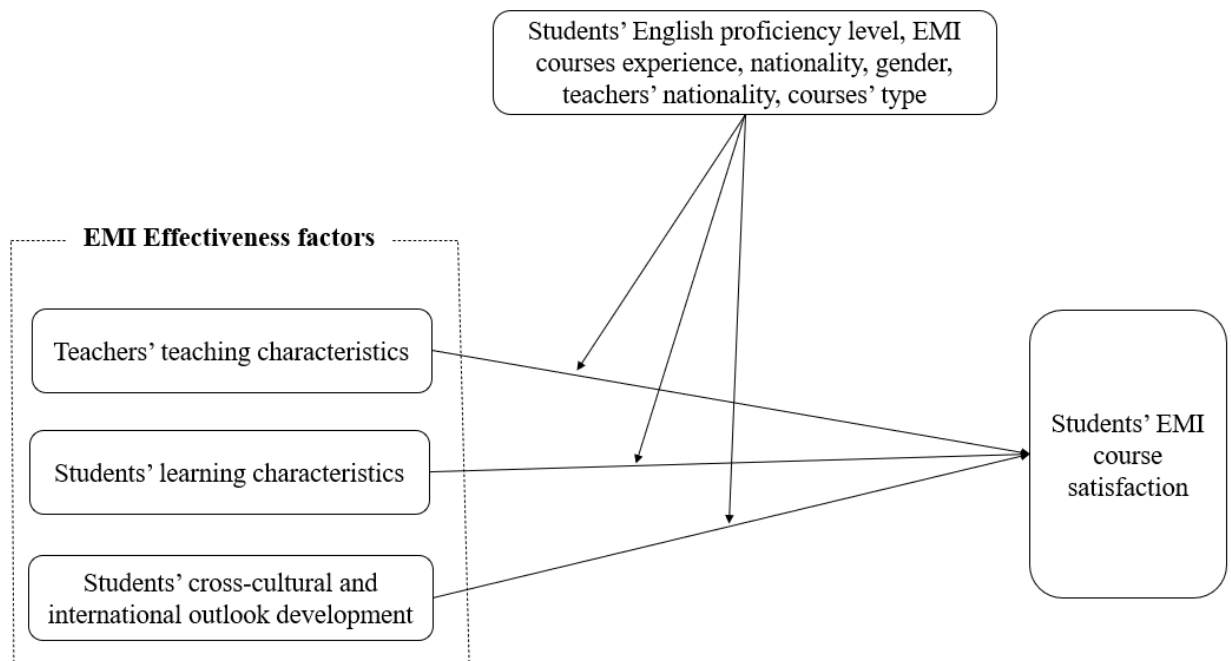


Figure 1: Research framework.



## **METHOD**

### ***Data collection process***

This exploratory quantitative research study aims to understand how university students enrolled in EMI programs in Vietnam and Taiwan perceive the effectiveness of EMI. A cross-sectional survey was conducted using a structured questionnaire to collect data from students participating in EMI courses. The survey was initially drafted in English, with measurement items drawn from prior research. It was then translated into Vietnamese and Chinese by two instructors from different institutions in Vietnam and Taiwan. To ensure the accuracy of the measurement scales, a reverse translation was performed.

Subsequently, ten Vietnamese and ten Taiwanese students enrolled in EMI courses at two public universities in their respective countries were interviewed to assess the feasibility of the translations, as well as the face and content validity of the study. After these interviews, a pilot test involving 50 students from each country was conducted to evaluate the Cronbach's alpha coefficient and the validity of the scale, before proceeding with the official survey.

### ***Sample***

The official survey was implemented in July 2023, using the convenience sampling method. The researchers approached four top universities in Taiwan and Vietnam that offer EMI courses (officially listed in the programs of the schools). A cross-sectional survey was used to obtain data using an online questionnaire distributed by the Office of Academic Affairs of the universities. This office emailed the survey to all undergraduate students enrolled in EMI courses. Ultimately, valid responses from 490 Taiwanese and 331 Vietnamese students were collected for further analysis. Table 1 summarizes the demographic characteristics of the participants.

### ***Measures***

*Independent variables:* Students' perceptions of EMI effectiveness factors were measured using the Le and Tang (2022) method with three dimensions that included: cross-cultural and international outlook development (five items), students' learning characteristics (four items), and teachers' teaching characteristics (10 items). Each item was measured by a five-point Likert scale (1 = not satisfied at all, 5 = very satisfied).

*Dependent variable:* Student satisfaction, adapted from Ali et al. (2016), was measured by examining students' overall satisfaction with EMI courses, which consisted of eight items. The anchor for these questions ranged from 1-strongly disagree to 5-strongly agree.

Students' English-proficiency level was assessed based on self-reported ratings on a scale from 1 to 6, where 1 corresponds to Beginner, 2 to Elementary English, 3 to Intermediate English, 4 to Upper-Intermediate English, 5 to Advanced English, and 6 to Proficiency English.

Students' experiences with EMI courses was assessed on a scale of 1 to 5, with 5 indicating that students had experienced more than four EMI courses (including the current course), 4 indicating four courses, 3 indicating three courses, 2 indicating two courses, and 1 indicating one course (current course).

Student nationality was categorized using a numerical coding system, where 1 represents

Taiwan and 2 represents Vietnam.

Student gender was categorized using a numerical coding system, with 1 denoting male and 2 denoting female.

Teacher nationality was categorized using a numerical coding system, where 1 designating local teachers and 2 designating foreign teachers.

Course type was categorized using a numerical coding system, where 1 indicated compulsory courses, and 2 indicated elective courses.

### *Analytic strategy*

The software used to analyse the data and test the research hypotheses were SPSS 24 and SMART PLS. The first was used to determine participant demographics and descriptive statistics. The second, SMARTPLS 3.3.9 software, was used for data analysis, including the testing of reliability, convergent and discriminant validity, as well as model testing. The multi-group analysis function, based on the generate-data-groups button of SMARTPLS, was used to test the moderating role of student nationality, student gender, course type, and teacher nationalities.

## **RESULTS**

### *Descriptive statistics*

Table 1 presents descriptive statistics of sample size, mean  $\pm$  standard deviation ( $M \pm SD$ ) and univariate analysis between/amongst the groups. Among them, teachers' teaching characteristics (TTC) exhibits the highest  $M \pm SD$  of  $4.08 \pm 0.68$ , followed by students' cross-cultural and international outlook development (CIOD) at  $3.69 \pm 0.93$ . Students' learning characteristics (SLC) follows closely at  $3.63 \pm 0.83$ , while the smallest mean is observed for students' EMI course satisfaction (SS) at  $3.62 \pm 0.88$ .

T-tests and one-way ANOVA tests were conducted to examine demographic characteristics influencing student satisfaction with EMI courses (SS). Analyses (see Table 1) revealed significant satisfaction differences, when considering effects on satisfaction of students' nationality, English proficiency level, prior EMI experience, teachers' nationality, and course type ( $p < 0.05$ ). Particularly, regarding student nationality, Vietnamese students reported higher satisfaction scores ( $3.97 \pm 0.67$ ), than those from Taiwanese students. Furthermore, satisfaction was higher among students taught by foreign teachers than by local teachers ( $3.77 \pm 0.76$ ). Elective-course students ( $3.97 \pm 0.64$ ) also indicated higher satisfaction scores compared to those from required-course students. Additionally, with respect to student EMI experience, students who had completed more than four EMI courses ( $3.91 \pm 0.76$ ) reported higher satisfaction levels than those who completed fewer. Likewise, students with the highest English proficiency level (C2) exhibited greater satisfaction ( $3.91 \pm 0.84$ ) with EMI courses compared to those with other proficiency levels. In other words, as students become more accustomed to EMI courses and achieve higher levels of English proficiency, they tend to perceive greater satisfaction with such courses, while other students might struggle more in such classes.

Table 1: Sample sizes,  $M \pm SD$  and univariate analysis between/amongst the groups.

	Sample sizes	CIOD	TTC	SLC	SS
<b>Whole sample</b>	821	3.69 ± 0.93	4.08 ± 0.68	3.63 ± 0.83	3.62 ± 0.88
<b>Student's nationality</b>					
Taiwan	490	3.59 ± 0.96	4.07 ± 0.69	3.47 ± 0.85	3.39 ± 0.93
Vietnam	331	3.84 ± 0.85	4.10 ± 0.66	3.87 ± 0.73	3.97 ± 0.67
<i>T</i>		-3.87***	-0.62	-7.26***	-10.38***
<b>Student's gender</b>					
Male	292	3.56 ± 1.05	4.05 ± 0.75	3.54 ± 0.87	3.55 ± 0.93
Female	529	3.77 ± 0.85	4.09 ± 0.64	3.69 ± 0.80	3.67 ± 0.85
<i>T</i>		-2.93**	-0.85	-2.45	-1.88
<b>Teachers' nationality</b>					
Local	440	3.54 ± 1.00	4.05 ± 0.70	3.52 ± 0.90	3.50 ± 0.96
Foreign	381	3.87 ± 0.87	4.10 ± 0.65	3.77 ± 0.72	3.77 ± 0.76
<i>T</i>		-5.30***	-1.07	-4.41***	-4.48***
<b>Course's type</b>					
Required	658	3.65 ± 0.94	4.07 ± 0.69	3.58 ± 0.84	3.54 ± 0.91
Elective	163	3.85 ± 0.86	4.10 ± 0.62	3.83 ± 0.73	3.97 ± 0.64
<i>T</i>		2.57*	-0.49	-3.79***	-6.97***
<b>EMI Experience</b>					
One course	203	3.50 ± 0.99	3.95 ± 0.71	3.44 ± 0.87	3.29 ± 0.91
Two courses	165	3.54 ± 0.97	4.09 ± 0.66	3.43 ± 0.89	3.39 ± 0.91
Three courses	102	3.73 ± 0.85	4.11 ± 0.70	3.63 ± 0.80	3.75 ± 0.80
Four courses	41	3.72 ± 0.90	4.11 ± 0.70	3.65 ± 0.73	3.71 ± 0.85
More than 4 courses	310	3.88 ± 0.85	4.14 ± 0.65	3.86 ± 0.73	3.91 ± 0.76
<i>F</i>		0.66***	2.54*	11.64***	20.83***
<b>English level</b>					
A1 (Beginner)	25	3.28 ± 1.14	3.51 ± 1.06	3.06 ± 1.14	3.14 ± 1.11
A2 (Elementary)	76	3.49 ± 1.00	3.96 ± 0.78	3.38 ± 0.88	3.24 ± 0.98
B1 (Intermediate)	307	3.72 ± 0.87	4.09 ± 0.61	3.61 ± 0.81	3.54 ± 0.90
B2 (Upper-Intermediate)	285	3.78 ± 0.90	4.16 ± 0.65	3.77 ± 0.80	3.77 ± 0.75
C1 (Advanced)	106	3.70 ± 1.01	4.09 ± 0.69	3.66 ± 0.73	3.80 ± 0.88
C2 (Proficiency)	22	3.42 ± 0.97	3.84 ± 0.64	3.61 ± 0.81	3.91 ± 0.84
<i>F</i>		2.68*	5.48***	5.55***	8.13***

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

### ***Evaluating measurement models: validity and reliability analysis***

Following Fornell and Larcker's (1981) suggestion, an assessment of the validity and reliability of the measures Cronbach's Alpha (CA), composite reliability (CR) and average variance (AVE) were extracted. In addition, the heterotrait- monotrait (HTMT) ratio of correlations was also examined to evaluate discriminant validity (Hair et al., 2011). Cronbach's Alpha values ranged between 0.84 and 0.93, exceeding the acceptable threshold of 0.70 (Hair et al., 2011). Three items (TTC3, TTC4, TTC7) were removed, due to factor loadings below the acceptable threshold of 0.7, as shown in Table 2. For CR, all the latent variables were in a range from 0.89 to 0.94. The AVE values for all latent variables exceeded 0.5, ranging between 0.57 and 0.75, meeting Chin's (1998) criterion for convergent validity. Table 3 indicates that the HTMT values are below the recommended threshold of 0.90, confirming adequate discriminant validity.

Table 2: Composite reliability of latent variables.

Item code	Students' cross-cultural and international outlook development (CIOD)	Students' EMI course satisfaction (SS)	Students' learning characteristics (SLC)	Teachers' teaching characteristics (TTC)
SLC1			0.77	
SLC2			0.81	
SLC3			0.85	
SLC4			0.85	
TTC1				0.74
TTC2				0.73
TTC5				0.78
TTC6				0.80
TTC8				0.71
TTC9				0.72
TTC10				0.80
SS1		0.85		
SS2		0.78		
SS3		0.86		
SS4		0.84		
SS5		0.75		
SS6		0.82		
SS7		0.83		
SS8		0.79		
CIOD1	0.75			
CIOD2	0.86			
CIOD3	0.88			
CIOD4	0.92			
CIOD5	0.92			
CA	0.92	0.93	0.84	0.87

AVE	0.75	0.66	0.67	0.57
CR	0.94	0.94	0.89	0.90

*Cronbach's (CA), composite reliability (CR) and average variance extracted (AVE)*

Table 3: HTMT (heterotrait–monotrait ratio).

Variables	CIOD	SS	SLC	TTC
CIOD				
SS	0.71			
SLC	0.70	0.81		
TTC	0.67	0.72	0.79	

### ***Evaluating the structural model: testing hypothesis and examining the quality of the proposed model***

*Lateral collinearity assessment:* Before evaluating the structural relationships, the inner and outer VIF values were computed to check for multicollinearity issues. Aiken et al. (1991) suggested that VIF values below 10 are acceptable, and this study found VIF values ranging from 1.76 to 4.57, indicating no multicollinearity concerns.

*Evaluating effect size:* The effect sizes for each proposed path coefficient were examined, showing that students' learning characteristics had the largest impact on student satisfaction ( $f^2 = 0.18$ ), followed by cross-cultural and international outlook development ( $f^2 = 0.12$ ), while teachers' teaching characteristics had a smaller, but still significant effect ( $f^2 = 0.07$ ). According to Cohen's (1988) guidelines, an effect size of 0.02 is considered small, 0.15 is medium, and 0.35 is large. Therefore, the effects observed here are medium to small in size.

*Model testing:* Bootstrapping is a resampling technique used to assess the stability and significance of path coefficients in Partial Least Squares Structural Equation Modeling (PLS-SEM). By generating thousands of subsamples, it helps to estimate the robustness of the model. As shown in Table 4, the standardized path coefficients ( $\beta$ ) and t-values reflect the strength and significance of the relationships between the variables. A higher t-value indicates stronger evidence to support the hypothesis, while the  $\beta$  coefficient shows the direction and strength of the relationship. The path coefficient ( $\beta$ ) represents the strength and direction of the relationship between variables, with a positive ( $\beta$ ) indicating that an increase in one variable leads to an increase in the other. The PLS-SEM results showed that there were all direct relationships between EMI effectiveness factors and students' EMI course satisfaction. Generally, H1a, H1b, and H1c were supported by the data.

The moderating effects of students' English proficiency and EMI course experience were also analyzed. The results indicate that higher English proficiency strengthens the impact of teachers' teaching characteristics on student satisfaction ( $\beta = 0.12^{**}$ ), while diminishing the influence of students' learning characteristics ( $\beta = -0.13^{***}$ ). Similarly, as students gain more experience with EMI courses, the effect of cross-cultural and international outlook development on satisfaction decreases ( $\beta = -0.12^{***}$ ), whereas the influence of teachers' characteristics increases ( $\beta = 0.12^{**}$ ). These findings underscore the importance of adapting teaching strategies to the proficiency and

experience levels of the students in EMI courses.

Table 4: Hypothesis testing results.

H	Relationship	Beta	<i>T</i> value	<i>P</i> Values	Significant
H1a	TTC -> SS	0.23	5.96	***	Yes
H1b	SLC -> SS	0.39	10.17	***	Yes
H1c	CIOD -> SS	0.29	8.57	***	Yes
Indirect effects					
H2a	CIOD*EPL -> SS	-0.02	0.79	0.43	No
H2b	SLC*EPL -> SS	-0.13	3.71	***	Yes
H2c	TTC*EPL -> SS	0.12	3.26	**	Yes
H3a	CIOD*EMC -> SS	-0.12	3.93	***	Yes
H3b	SLC*EMC -> SS	-0.07	1.74	0.08	No
H3c	TTC*EMC-> SS	0.12	2.95	**	Yes

Students' English proficiency level (EPL), Students' experience with EMI courses (EMC)

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

Figures 2 to 5 provide a visual of the moderation results. Figure 2 suggests that as students' English proficiency level increases, the impact of their learning characteristics on satisfaction diminishes, while the impact of teachers' teaching characteristics on satisfaction is strengthened as students' English proficiency level rises, when compared with lower English proficiency level students (Figure 3). Figure 4 confirms that as students accumulate more experience with EMI courses, the influence of cross-cultural and international outlook development on their satisfaction diminishes, while the effect of teachers' teaching characteristics on satisfaction increases, as students gain more EMI course exposure, when compared with students with less experience with EMI courses (see Figure 5).

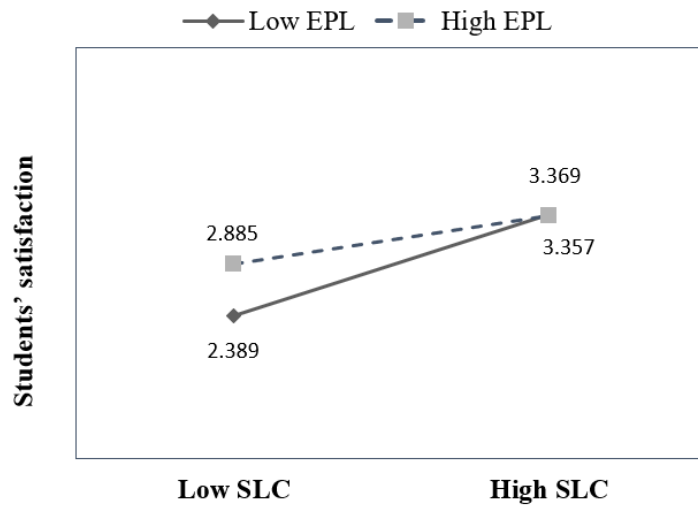


Figure 2: Students' EPL x SLC predicting students' satisfaction.

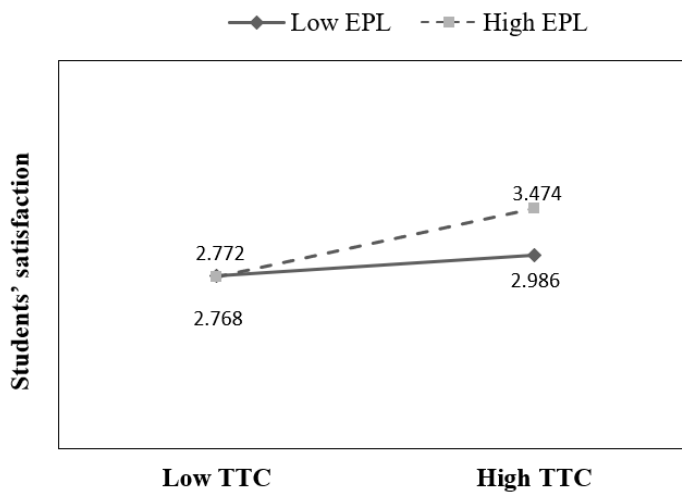


Figure 3: Students' EPL x TTC predicting students' satisfaction.

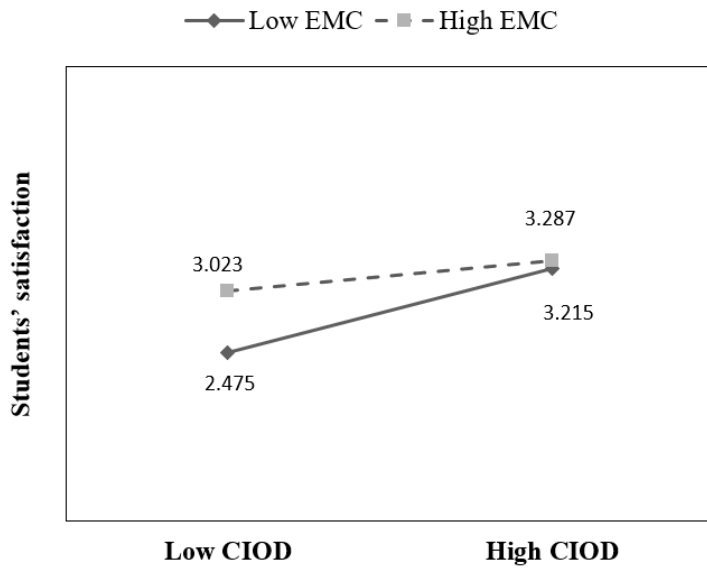


Figure 4: Students' EMC x CIOD predicting students' satisfaction.

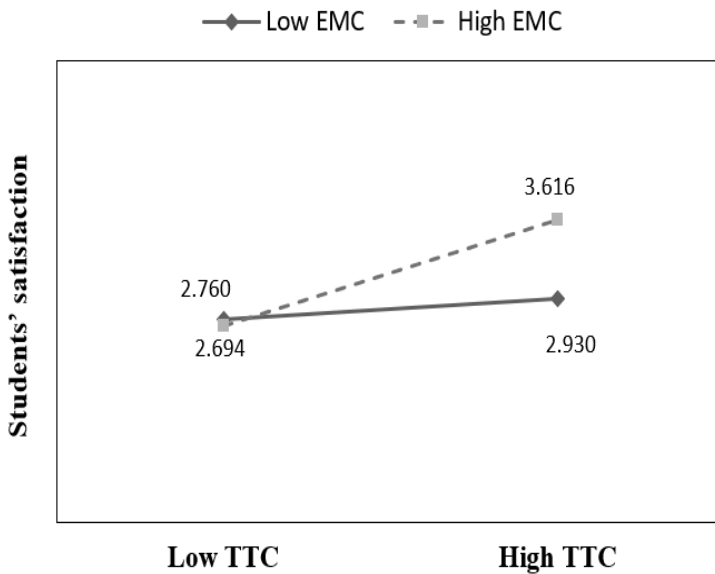


Figure 5: Students' EMC x TTC predicting students' satisfaction.

### *Assessment of group differences*

Henseler's Multi-Group Analysis (MGA), a non-parametric test, was employed to assess whether or not there are significant differences in path coefficients between various groups (e.g., nationality, gender, teacher nationality). A five percent significance level is applied, meaning that a significant difference exists between two groups, if the p-value is less than 0.05, or greater than 0.95. The PLS-MGA p-values are shown in Table 5. There were no significant differences found



between elective and compulsory courses ( $p > 0.05$ ), indicating that the type of course did not significantly impact students' satisfaction with EMI courses. This suggests that other factors, such as teaching or learning characteristics, may play a larger role in influencing satisfaction, regardless of the course type.

*Student nationalities:* A significant difference ( $\beta = 0.186^{**}$ ) was observed between Taiwanese and Vietnamese students in the relationship between cross-cultural and international outlook development (CIOD) and course satisfaction. Taiwanese students exhibited a stronger path coefficient ( $\beta = 0.335^{***}$ ) than Vietnamese students ( $\beta = 0.149^{**}$ ), which may be attributed to differing educational environments, or cultural perspectives, on cross-cultural competency in academic settings.

*Student gender:* A significant difference ( $\beta = -0.170^{*}$ ) was found in the relationship between teachers' teaching characteristics and students' satisfaction, with male students ( $\beta = 0.334^{***}$ ) showing a stronger effect than female students ( $\beta = 0.164^{***}$ ). This suggests that male students might place greater value on the teaching style or content delivery in their evaluation of EMI courses. Further research could investigate whether male students prioritize teaching attributes differently than female students.

*Teacher nationalities:* The analysis revealed a significant difference ( $\beta = -0.157^{*}$ ) in the relationship between students' cross-cultural and international outlook development and satisfaction, based on teacher nationality. Local teachers ( $\beta = 0.326^{***}$ ) had a stronger impact than foreign teachers ( $\beta = 0.168^{***}$ ), possibly because while foreign instructors inherently represent internationalization and cultural diversity, students perceive that local teachers demonstrate more variable effectiveness in developing students' cross-cultural interactive and openness development (CIOD). This finding suggests that enhancing CIOD competencies represents a crucial area for professional development, among local teachers, to improve student satisfaction with EMI courses. Local teachers may have a better understanding of the cultural and contextual needs of students, thereby enhancing their ability to foster cross-cultural competence.

Table 5: Outcomes of the multi-group analysis.

Based on students' nationalities					
Relationship	Taiwan	Vietnam	Path coefficient difference (Diff.)	Heseler's MGA p-value	Decision
CIOD->SS	0.335***	0.149**	0.186	0.004**	Yes
SLC->SS	0.339***	0.217**	0.121	0.135	No
TTC -> SS	0.309***	0.381***	-0.072	0.379	No
Based on students' gender					
Relationship	Female	Male	Diff.	Heseler's MGA p-Value	Decision
CIOD->SS	0.295***	0.266***	0.029	0.665	No
SLC->SS	0.407***	0.349***	0.058	0.435	No
TTC -> SS	0.164***	0.334***	-0.170	0.029*	Yes
Based on teachers' nationalities					

	FT	LT	Diff.	Heseler's p-Value	MGA	Decision
CIOD->SS	0.168***	0.326***	-0.157	0.015*		Yes
SLC->SS	0.312***	0.397***	-0.086	0.240		No
TTC -> SS	0.348***	0.21***	0.138	0.084		No
Based on course type						
Relationship	Elective	Compulsory	Diff.	Heseler's p-Value	MGA	Decision
CIOD->SS	0.15	0.302***	0.155	0.129		No
SLC->SS	0.24	0.378***	0.137	0.217		No
TTC -> SS	0.348***	0.253***	-0.095	0.362		No

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

## Discussion

This study builds upon Le and Tang's (2022) work, by identifying specific student characteristics, such as nationality and English proficiency, that moderate the influence of EMI effectiveness factors. Overall, this analysis reveals the positive effects of students' cross-cultural and international outlook development, students' learning characteristics, and teachers' teaching characteristics on students' EMI course satisfaction in the context of Vietnam and Taiwan. This research shows that exposure to cross-cultural and international perspectives significantly enhances student satisfaction with EMI courses, and highlights the importance of integrating diverse cultural elements into the curriculum, particularly in a globalized world where cross-cultural competence is increasingly valuable. Teacher effectiveness also plays a crucial role in student satisfaction with EMI courses. This could include teaching methods, communication skills, cultural sensitivity, and the ability to create an inclusive and engaging learning environment. Effective teaching characteristics are essential for ensuring that students not only grasp the subject matter, but also enjoy the learning process (Stronge, 2018). Surprisingly, the result shows that among three EMI effectiveness factors, characteristics related to how students approach learning have the most influence on their satisfaction with EMI courses. Since this factor involves students' background knowledge for the course, incentives for students to participate in the course, and student involvement in learning, the understanding of, and catering to, individual learning characteristics of students can contribute to a more effective and satisfying educational experience.

On the other hand, the results show that as student English proficiency increases, the impact of a teacher's teaching characteristics on their satisfaction increases. This emphasizes that higher English proficiency among students correlates with better comprehension of course materials, increased engagement, and a more positive learning experience (Chen et al., 2022), leading to higher satisfaction (Diep et al., 2017). Meanwhile, the influence of students' learning characteristics on their satisfaction is stronger with those students with lower levels of English proficiency. These students appear to exert greater effort on their learning characteristics (e.g., their background knowledge and English), and enjoy the EMI learning process better than their peers (Le & Tang, 2022; Tseng et al., 2020). In other words, students with lower English proficiency may require more targeted instructional support, as they may struggle with comprehension and

engagement. Teachers can help to mitigate these challenges by creating supportive learning environments that reduce language-related anxiety and encourage active participation.

With respect to student nationality, the study also revealed that Taiwanese students value cross-cultural and international outlook development more than Vietnamese students, when EMI course satisfaction is predicted. This echoes the Chu et al. (2018) finding that while internationalization has become more and more emphasized, and more international students are enrolled (Vuong et al., 2021), Taiwanese students have begun to perceive the importance of internationalizing themselves and cultivating relevant competence in EMI courses.

Other findings suggest that male students place more emphasis on teachers' teaching characteristics, potentially due to their higher levels of anxiety in EMI courses. This discovery calls for more tailored teaching strategies that address the specific needs of male students, particularly those who may struggle with language proficiency.

Finally, the study highlights the importance of local teachers embedding cross-cultural elements into their instruction. While foreign instructors naturally integrate international perspectives into their teaching, local teachers need to deliberately incorporate cross-cultural elements into their course design and delivery. This intentional approach to cultural integration is particularly crucial for students who are new to EMI environments, as it helps to bridge their transition to international academic discourse, and enhances their cross-cultural competence. This reflects that, in order to become EMI teachers, local teachers will have to develop not only English language competency (Macaro & Han, 2020), teaching skills (O'Dowd, 2018), subject-specific competencies (Jiang et al., 2019), and assessment for learning practices (Inbar-Lourie, 2022), but also multicultural teaching competency (Leung & Hue, 2020). It is also suggested that EMI teachers should be trained abroad, so that they gain experiences in multicultural contexts and multicultural teaching {Farrell, 2020 #383}. In this way, they will know better how to help their students to achieve cross-cultural and international outlook development. On the other hand, if the students in their classes have less EMI experience, teachers can include more tailored cross-cultural components, such as enhancing students' international outlook, providing opportunities for students to meet and interact with students from different countries/cultures, expanding students' intercultural awareness, or improving students' cross-cultural communication skills, so as to cultivate their cross-cultural and international outlook development.

## **Conclusion**

This study contributes to the understanding of how students and teachers' demographic factors, such as nationality, gender, and English proficiency shape student satisfaction in EMI courses. By highlighting the role of cross-cultural development and tailored teaching approaches, this research offers valuable insights for curriculum designers and instructors aiming to enhance the EMI experience. These findings underscore the need for continuous professional development programs that are tailored to the unique needs of teachers working in diverse EMI contexts. These programs should focus not only on language skills, but also on enhancing teachers' ability to foster cross-cultural competencies in their students.

One limitation of this study is the reliance on self-reported English proficiency, which may introduce subjective bias. Future studies should consider objective measures of language proficiency and incorporate teacher and institutional perspectives to provide a more comprehensive

understanding of the EMI learning process. Future research should also explore the perspectives of other stakeholders, such as teachers and administrators, to develop a more holistic view of EMI effectiveness. Additionally, longitudinal studies examining changes in student satisfaction over time, as their EMI experience increases, would provide valuable insights into how teaching strategies could evolve.

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The authors report that there are no competing interests to declare.

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## Appendix

### QUESTIONNAIRE

#### STUDENT'S SATISFACTION WITH ENGLISH-MEDIUM INSTRUCTION (EMI) COURSE(S)

Dear students,

This questionnaire is about your satisfaction with English as a medium of instruction (EMI) course(s). The data collected will be used only for academic research. The information that you provide is only to obtain general themes and individual responses will not be analyzed in isolation. All responses are anonymous, and no data will be used to identify you individually. It should take about 10 minutes to answer this survey. With your participation, the full picture of the implementation of all English courses in Taiwan/ Vietnam can be revealed. Thank you for your support and assistance!

#### **PART I: EXPERIENCE OF ENGLISH MEDIUM INSTRUCTION (EMI) COURSES**

Please specify your level of agreement towards the following statements about your own experience on the current offering of courses in English at universities in Vietnam/ Taiwan by circling ONE number on every line. These numbers express your agreement level on these statements from 1 to 5 (1=low level, 5= high level).

#### **A. HOW WOULD YOU EVALUATE THE IMPORTANCE OF THESE ELEMENTS IN DETERMINING THE QUALITY OF EMI COURSE(S)?**

Please specify your evaluation towards the following statement by circle ONE number on every line.

No	Statement	Totally disagree	Disagree	Neutral	Agree	Totally Agree
<b>Teacher's teaching characteristics</b>						
TC1	Course learning objectives are clear.	1	2	3	4	5
TC2	Course learning materials are easily	1	2	3	4	5



	available.					
TC3	Course content is relevant to subject theory.	1	2	3	4	5
TC4	Course content is relevant to subject practice.	1	2	3	4	5
TC5	Teacher's or Teaching Assistant's academic counselling outside class.	1	2	3	4	5
TC6	Class materials, resources, and bibliography are suitable and updated.	1	2	3	4	5
TC8	Teachers' professional knowledge.					
TC9	Teachers' English proficiency level.	1	2	3	4	5
TC10	Teachers manage classroom interaction and feedback.	1	2	3	4	5
<b>Student's teaching characteristics</b>						
SC1	Students' background knowledge for this course.	1	2	3	4	5
SC2	Students' English proficiency level.	1	2	3	4	5
SC3	There are incentives for students to participate in the course.	1	2	3	4	5
SC4	Students' involvement in learning.	1	2	3	4	5
<b>Cross-cultural and international outlook development</b>						
CC1	The course enhances students' international outlook.	1	2	3	4	5
CC2	The course provides opportunities for students to meet and interact with students from different countries/cultures.	1	2	3	4	5
CC3	The course deepens students' intercultural awareness.	1	2	3	4	5
CC4	The course improves students' cross-cultural communication skills.	1	2	3	4	5
CC5	The course improves teachers' intercultural/cross-cultural competence.					

**B. WITH THE FOLLOWING ELEMENTS WHEN ATTENDING EMI COURSES?**

Please specify your evaluation towards the following statement by circle ONE number on every line.

No	Statement	Totally dissatisfied	Dissatisfied	Neutral	Satisfied	Totally satisfied
S1	In general, I am satisfied with the EMI course.	1	2	3	4	5
S2	I perceive I have learned as much content as the students in the Vietnamese courses.	1	2	3	4	5
S3	I would recommend other students to take the EMI courses	1	2	3	4	5
S4	The course(s) has improved my English proficiency	1	2	3	4	5
S5	The course(s) enhance my professional knowledge.	1	2	3	4	5
S6	The course(s) make me feel more confident when applying for a job	1	2	3	4	5
S7	The course(s) prepare me well for the international workplace					
S8	Studying in EMI courses give me	1	2	3	4	5

opportunities to study abroad for postgraduate degrees					
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**PART II: BACKGROUND INFORMATION**

1. Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female
2. Your field of study:	<input type="checkbox"/> Business <input type="checkbox"/> Engineering <input type="checkbox"/> Science	<input type="checkbox"/> Humanity and Social Science <input type="checkbox"/> Education <input type="checkbox"/> Others
3. Type of Course:	<input type="checkbox"/> Required	<input type="checkbox"/> Elective
4. Have you received any form of EMI before?	<input type="checkbox"/> Never <input type="checkbox"/> One course <input type="checkbox"/> Two courses	<input type="checkbox"/> Three courses <input type="checkbox"/> Four courses <input type="checkbox"/> More than 4 courses
5. Have you ever been studied abroad or a student exchange before?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6. English Language Proficiency level:	<input type="checkbox"/> A1 (Beginner) <input type="checkbox"/> A2 (Elementary English) <input type="checkbox"/> B1 (Intermediate English)	<input type="checkbox"/> B2 (Upper-Intermediate English) <input type="checkbox"/> C1 (Advanced English) <input type="checkbox"/> C2 (Proficiency English)
7. GPA (scale of 10 or scale of 4)	<input type="checkbox"/> 9.0 – 10.0 or 3,60 – 4,00 <input type="checkbox"/> 8.0 – 8.9 or 3,20 – 3,59 <input type="checkbox"/> 7.0 – 7.9 or 2,50 – 3,19	<input type="checkbox"/> 6.0 – 6.9 or 2,00 – 2,49 <input type="checkbox"/> Others
8. Teacher	<input type="checkbox"/> Vietnamese/ Taiwanese	<input type="checkbox"/> Foreigner

Once again, we would like to thank you so much for your kind attention. If you are interested in seeing the final research or have any questions about this process, please contact the research team at email:

