In-class and Out-of-class Anxiety when English is Used as Lingua Academia

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Little research has investigated the constructs of in-class and out-of-class language anxiety in Thai universities where English is used as a lingua academia – medium of instruction in a content class and language of communication out of class. This paper reports the level of language anxiety experienced by students enrolled in full English-medium-instruction engineering programs, establishes the relationship between and among the two anxiety constructs, year level and specific and general English language proficiency, and elicits factors of in-class and out-of-class anxiety. Descriptive statistics was used to compute the extent of anxiety engineering students experienced in and out of class. Meanwhile, correlational statistics were used to explore the relationships between and among year level, language proficiency, in-class anxiety, and out-of-class anxiety. Finally, factor analysis was used to elicit factors. Data have shown that engineering students feel anxiety when English is used both in and out of class. They feel pressured to prepare well for the English-medium class in the classroom. Outside the classroom, they feel very anxious when the interlocutor seems unwilling to communicate. In addition, some significant relationships were found between variables. Factors in in-class anxiety were fear of failure, cognitive processing anxiety, lack of preparation, lack of confidence, fear of speaking, dislike of the English-medium class, negative peer evaluation, and feeling of discomfort. Meanwhile, out-of-class anxiety has three factors, including language processing difficulty, accentedness of speech, and fear of being corrected. Pedagogical implications were discussed to help alleviate students' feelings of anxiety in in-class and out-of-class settings.

Keywords: in-class anxiety, out-of-class anxiety, engineering students, English as a medium of instruction, English as lingua academia, international Engineering programs

INTRODUCTION

With the advent of internationalization in higher education, Thai universities have offered international engineering, science, and technology programs. Recent studies have shown the challenges experienced by students, teachers, and program administrators (Belhia & Elhami, 2014; Byun et al., 2011; Galloway, 2017; Kirkgoz, 2005; Pomat et al., 2022; Rose & Rose, 2021; Sert, 2008; Tang, 2020; Vinke, 1995;

Wilang & Nupong, 2022; Yildiz et al., 2017). These challenges include but are not limited to students' low English language proficiency, teachers' failure to deliver content lessons in English effectively, lack of confidence among students, stakeholders' negative attitude towards English as a medium instruction (EMI), and students' preference for their L1.

One of the challenges needing attention is anxiety when English is used as the medium of instruction and language of communication, herein referred to as lingua academia. Like in English as a foreign language (EFL) and English as a lingua franca (ELF) settings, speaking English is one of the most anxiety-provoking situations (Akkakoson, 2016; Hasibuan et al., 2022; Paranuwat, 2011; Wilang & Singhasiri, 2017; Woodrow, 2006). High anxiety may hinder students' goals, for example, expressing their thoughts in English in their content class and out-of-class situations.

In-class anxiety

In the EFL classroom, Horwitz, Horwitz, and Cope (1986) have conceptualized foreign language anxiety (FLA) as situation-specific with three specific anxiety-provoking factors: communication apprehension (fear of communicating with others), test anxiety (fear of evaluation such as tests and quizzes), and fear of negative evaluation (negative thoughts of others). Accordingly, FLA is defined as "a distinct complex of self-perceptions, beliefs, feelings, and behaviours related to classroom learning arising from the uniqueness of the language learning process (Horwitz et al., 1986, p. 128). Also, it could be "the worry and negative emotional reaction aroused when learning or using a second language (MacIntyre, 1998, p.27). Factor analysis elicited three constructs such as input anxiety (e.g., when a foreign language is spoken fast), processing anxiety (i.e., inability to acquire vocabulary on time), and output anxiety (e.g., when a student has difficulty in using vocabulary in a talk).

Many studies have shown that FLA has pervasive effects on students' achievement and performance (Cheng, 2004; Contreras-Soto et al., 2019; Dogan, 2008; Elkhafaifi, 2005; Hewitt & Stephenson, 2011; Iscan, 2011; Kim, 2000; Liu, 2004; Metwally et al., 2022; Salwa, 2020; Sulaiman & Altakhaineh, 2021; Zhang, 2004). Also, it has debilitating effects in various domains of language learning. For example, in writing, Daud and colleagues (2016) have found that students with higher anxiety resulted in lower writing performance due to worries of lack of skills to do the task. Zhang (2011) listed eight causes of writing anxiety: insufficient knowledge of the topic, linguistic challenges, fear of negative evaluation, low self-confidence, lack of writing practice and technique, insufficient effective feedback, and fear of tests. In reading, the text's difficulty can result in higher reading anxiety (Saito et al., 1999), and that reading anxiety can lead to lower motivation (Torudom & Taylor, 2017; Zarei, 2014). Aisyah (2017) reported the following causes of reading anxiety: unknown words, unfamiliar topics, unfamiliar culture, apprehension of making errors, and fear of reading. Nurkhamidah (2020) found some factors such as speech rate, vocabulary and accent, and concentration in listening. Moreover, poor quality audio sounds trigger listening anxiety. Generally, it hinders students' language learning process (Horwitz, 2001).

Several individual variables such as age, perceived English proficiency, gender, and year level have received inconsistent relationships with FLA. Concerning age and FLA, Dewaele (2007) has shown that older learners experience a higher level of anxiety. However, the following year, Dewaele, Petrides, and Furnham (2008) reported the opposite, in which older learners suffer less anxiety. On gender, Dewaele and his colleagues (2008) have found that female learners feel more anxious in public speaking. In general FLA, no relationship was established between anxiety and gender (Chen, 2021; Kimura, 2008; Matsuda & Gobel, 2004). Regarding year level and language proficiency, some studies have reported negative relationships between the two variables and FLA (Lie, 2016; Onwuegbuzie et al., 1999; Pichette, 2009). Radix-Bojanic and Topalov (2021) revealed that explanatory variables such as gender, grade and proficient affect the students' level of anxiety. Empirical evidence is also needed to ascertain if inconclusive findings can be found in classrooms where English is the medium of instruction.

Similar to EFL settings, studies in the EMI context have shown that students were found anxious due to some factors. For example, Chou (2018) revealed five components of language anxiety when English is used as a medium of instruction, including (1) speech anxiety, (2) lack of confidence in speaking, (3) feelings in response to EFL learning in the classroom, (4) fear of being corrected by the teacher, and (5) fear of failing the EFL course. Other possible factors that may cause anxiety in the EMI context include challenges with understanding technical words, low English proficiency level to understand the content lessons, and negative attitude towards English (Jiang et al., 2016; Yildiz et al., 2017; Wilang & Nupong, 2022). Among students enrolled in full and partial EMI programs, Chou (2018) reported that students enrolled in full EMI experienced lesser speech anxiety, lesser uncertainty in speech, and lesser negative feelings toward learning English than those enrolled in partial EMI. More studies are needed to provide empirical evidence on this topic at hand.

Out-of-class anxiety

Out of class, communication breakdown could happen between Thai and international students when interlocutors are anxious, when an interlocutor asks difficult questions, when some words are unfamiliar, when the speaker or listener seems unwilling to communicate, when the speech is accented or when the speaker speaks a native-like accent (Wilang & Singhasiri, 2017). Among Asian students studying in Australia, interacting with native speakers was the most anxiety-provoking situation (Woodrow, 2006). Furthermore, in the Turkish context, out-of-class anxiety has been reported higher than in the in-class context as regards speaking (Karci et al., 2018).

Anxiety could affect successful communication when English is used as a lingua franca. MacIntyre and Gardner (1981) have reported the debilitating effect of anxiety on cognitive processes - input, processing, and output. Moreover, Matsuura (2007) has shown that intelligibility and perceived comprehensibility could be affected by anxiety negatively.

While there is a plethora of studies on foreign language anxiety research in in-class settings, few studies focused on anxiety situations outside the classroom where English is used as a lingua franca among students, teachers, and staff.

Research Objectives

Due to the prevalence of anxiety interfering with content lesson comprehension and contributing to communication breakdown, three objectives were set in this study: to know the extent of anxiety engineering students feel in in-class and out-of-class settings; to explore the relationships between the two anxiety constructs including other variables such as year level and specific and general English language proficiency; and, to elicit the factors of in-class anxiety and out-of-class anxiety. Thus, three questions are asked:

1. *To what extent do engineering students feel anxious when speaking English as lingua academia?*
2. *Are there significant relationships between and among year level, skill-specific and general perceived English proficiency level, in-class speaking anxiety, and out-of-class anxiety?*
3. *What are the in-class and out-of-class factors causing anxiety for engineering students when English is used as lingua academia?*

It is essential to keep exploring students' anxiety when English is used as lingua academia in various contexts to help them feel at ease since speaking English is unavoidable in today's globalized world and education. Furthermore, the findings would allow teachers and administrators to design less anxiety-provoking programs or activities for students enrolled in engineering programs in a country where English is not their first language and, in a setting, where it is not widely spoken outside and inside the academia.

METHOD

This study adopted quantitative design to know the extent of anxiety experienced by engineering students when English is used as a medium of instruction and the lingua franca outside the classroom. Moreover, it hopes to establish the relationships between and among both anxiety constructs, year level, and perceived specific and general English language proficiencies of the participants.

Participants of the study

Using convenience and snowball sampling, 145 engineering students participated in the study. They were enrolled in various international engineering programs in one of the most prestigious universities in Thailand. Of the participants, 74 were first-year students, 15 were sophomores, 48 were juniors, 7 were seniors, and 1 was in his fifth year of study.

Instruments

The online survey questionnaire was designed using Google Form. It has four sections including consent to take part in the study, questions about the background information

of the participants (i.e., program of study and perceived proficiency levels), 29 items on in-class anxiety, and 21 items about out-of-class anxiety (see descriptions below). After submission, the participants were not allowed to modify their answers.

In-class Anxiety Scale

The scale was adapted from existing foreign language anxiety surveys (see Horwitz et al., 1986 and Paranuwat, 2011). In the EFL setting, three common factors causing anxiety are *communication apprehension, negative peer evaluation*, and *test anxiety* (see Horwitz et al., 1986). To suit the context of the study, two adaptations were made. First, items with English classes or tests were reworded into English-medium classes or tests to reflect the study context, in which English is used as the language of instruction and communication in international engineering programs. Second, it was adapted into a 4-point Likert scale survey. Without the neutral option, the participants would be obliged to indicate their level of in-class anxiety. The mean scores were calculated and interpreted as follows: 1.0 – 1.75 *Strongly disagree*; 1.76 – 2.50 *Disagree*; 2.51 – 3.25 *Agree*; and 3.26 – 4.0 *Strongly agree*. To ascertain the internal reliability of the instrument, Cronbach's alpha was calculated, and the internal consistency was found at 0.93, which means a high level of consistency.

Out-of-class Anxiety Scale

The 21-item 5-point Likert Anxiety Scale for Spoken Englishes as a Lingua Franca (ASSELF) was used to measure the participants' anxiety outside the classroom when English is used as the medium of instruction. It was adopted from Wilang and Singhasiri's (2017) study among students enrolled in the 'international' universities in Thailand, which is similar to the current study. Accordingly, three factors causing anxiety out-of-class are *interlocutor-induced difficulties*, *language-processing difficulties*, and *apprehension over interlocutors*. After the mean scores were calculated, the following interpretations were used: *Not anxious* (1.00-1.79); *Slightly anxious* (1.80-2.59); *Moderately anxious* (2.60-3.49); Very anxious (3.50-4.29); and, *Extremely anxious* (4.30-5.00). To compute the survey's internal consistency in this study, Cronbach's alpha was used, and the result was 0.95, which means a high level of consistency.

Data collection procedures

The researcher has asked lecturers and students to send the survey link to engineering students enrolled in international programs. The data was collected from December 2021 to March 2022.

Data analysis

In line with the questions in the study, descriptive statistics was used to know the extent of in-class and out-of-class anxiety. Further, correlational statistics was utilized to calculate the relationship between and among year level, skill-specific and general English language proficiency, in-class anxiety, and out-of-class anxiety. Finally, principal component analysis was used to determine factors of in-class and out-of-class anxiety. To ensure the construct validity of factors of in-class and out-of-class anxiety,

the following criteria were considered: eigenvalue of >1.0, sampling adequacy of above .60, factor loadings of >.40, and the interpretability of the factor structure (Field, Miles & Field, 2012).

FINDINGS AND DISCUSSION

To what extent do engineering students feel anxious when speaking English inside the classroom?

Based on table 1, out of 31 items, engineering students generally feel anxious with 21 situations in the English-medium class. The item with the highest anxiety was 25 - *I feel pressured to prepare very well for the English-medium class*. They disagreed with ten items, of which item 12, "*I feel like not going to my English-medium class,*" received the lowest mean score.

Table 1
Descriptive statistics for in-class anxiety in the English-medium class

Item	Statement	M, SD *Interpretation*
25	I feel pressured to prepare very well for the English-medium class.	3.41, 0.78, *Agree*
18	I start to panic when I have to speak English without preparation in the English-medium class.	3.08, 0.78 *Agree*
27	I get nervous when the teacher asks questions I haven't prepared in advance in the English-medium class.	3.00, 0.71 *Agree*
15	I can feel my heart pounding when I'm going to be called on in the English-medium class.	3.00, 0.76 *Agree*
17	I always feel that the other students speak English better than I do in the English-medium class.	2.97, 0.77 *Agree*
29	I'm often afraid that my score in the English-medium class will be less than what I expected.	2.96, 0.78 *Agree*
6	I keep thinking other students are better than me in the English-medium class.	2.91, 0.78 *Agree*
24	I get nervous when I don't understand every word the teacher says in the English-medium class.	2.84, 0.70 *Agree*
3	It frightens me when I don't understand what the teacher is saying in the English-medium class.	2.84, 0.79 *Agree*
21	Even if I am well prepared for the test, I feel anxious about it.	2.81, 0.75 *Agree*
23	I get nervous when speaking English in the English-medium class.	2.73, 0.62 *Agree*
1	I never feel quite sure of myself when speaking in an English-medium class.	2.73, 0.72 *Agree*
10	I feel worried about the differences between what I have prepared for a test and the test in the English-medium class.	2.68, 0.80 *Agree*
4	I feel very self-conscious about speaking English in front of other students in the English-medium class.	2.68, 0.74 *Agree*
14	I usually get nervous during tests in my English-medium class.	2.64, 0.69 *Agree*
8	I worry about the consequences of failing in English-medium class.	2.60, 0.91 *Agree*
13	I don't feel confident speaking English in the English-medium class.	2.59, 0.74 *Agree*
26	I feel overwhelmed by the number of pronunciation rules I must learn to speak English in the English-medium class.	2.55, 0.76 *Agree*
22	I don't feel comfortable around good speakers of English in the English-medium class.	2.55, 0.69 *Agree*
2	I tremble when I know I will be called on in the English-medium class.	2.54, 0.72 *Agree*
16	I feel worried about learning content and language in the English-medium class.	2.51, 0.77 *Agree*
30	I feel overwhelmed by the number of content words I must learn to speak in the English-medium class.	2.49, 0.83, *DA*
9	It embarrasses me to volunteer answers in my English-medium class.	2.46, 0.74 *DA*
19	I feel more tense and nervous in my English-medium class than in my other classes.	2.45, 0.90 *DA*
20	I am afraid the other students will laugh at me when I speak English in the English-medium class.	2.42, 0.86 *DA*
5	The English-medium class moves so quickly that I worry about getting left behind.	2.39, 0.81 *DA*
28	I feel unhappy when I go to my English-medium class.	2.33, 0.65 *DA*
11	The more I study for the English-medium test, the more confused I get.	2.31, 0.79 *DA*
31	It bothers me to take more English-medium classes.	2.31, 0.78 *DA*
7	I feel overwhelmed by the number of rules I have to learn to speak English.	2.29, 0.77 *DA*
12	I feel like not going to my English-medium class.	1.78, 0.76 *DA*

*DA means Disagree

Concerning in-class anxiety, item 25, *I feel pressured to prepare very well for the English-medium class*, which could be the most anxiety-provoking in the classroom as students are expected to have a higher level of English proficiency to understand the content taught in class. Previous studies have shown that one of the difficulties students face in EMI programs is low proficiency in English, which affects the student's ability to understand the content of lesson (Galloway, 2017; Kirkgoz, 2005; Pomat et al., 2022; Rose & Rose, 2021; Sert, 2008; Wilang & Nupong, 2022; Yildiz et al., 2017). In this case, lower proficient students may put much effort into finding resources to help them prepare for the English-medium class. However, it is possible that they thought that what they had prepared may not be enough to comprehend the content lesson. Other anxiety-provoking situations are in line with preparation - when they have to speak without preparation (Item 18) and when the teacher asks questions they have not prepared in advance (Item 27).

Though learning in English-medium class is generally anxiety-provoking, students are not embarrassed to volunteer to answer questions or not worried that the other students will laugh at them when they speak English in the English-medium class (see items 5, 7, 9, 11, 19, and 31). This finding is somewhat surprising compared to the anxiety in Thai EFL settings, where students are very anxious about peer negative evaluation (Paranuwat, 2011). Unlike students in EFL classes, studying an EMI program or course is a choice among students in Thailand. Students enrolled in English-medium programs are expected to improve their English proficiency along with having their degree (Jiang et al., 2016).

Item 12, *I feel like not going to my English-medium class,* was the lowest mean score because students knew they were enrolled in an international engineering program where English is the medium of instruction and communication in the classroom. Despite the difficulties students face, such as panicking when they have to speak English without preparation in the English-medium classroom (item 18) or being afraid that their score in the English-medium class will be less than what they expect (Item 29), they are self-obliged to attend the class probably due to their study and life goals.

Results have also indicated the need for students to prepare whenever a speaking engagement is required, for example, when answering a question or speaking in front of the class. Thus, there is need for teachers to introduce content-related vocabulary to help students comprehend the lesson. Students need to boost their self-esteem, so they do not need to compare themselves or their performance to their peers. Also, test-related anxiety should be decreased. Like previous FLA studies, engineering students enrolled in EMI programs experienced physiological effects of fear, for instance, a pounding heart.

To what extent do engineering students feel anxious when speaking English outside the classroom?

Based on Table 2, engineering students were very anxious with 11 items and were moderately anxious with ten items. The highest anxiety-provoking situation was item 21,

The interlocutor seemed unwilling to communicate, while the item with the lowest score was item 6, *The interlocutor speaks a non-native accent*.

Table 2
Descriptive statistics for anxiety in the out-of-class setting

Item	Statement	M, SD *Interpretation*
21	The interlocutor seems unwilling to communicate.	3.93, 1.07, *VA*
9	I cannot understand the meaning behind an utterance.	3.75, 1.04, *VA*
4	I cannot decode the interlocutor's words/phrases.	3.67, 0.99, *VA*
7	The interlocutor speaks fast.	3.67, 0.94, *VA*
14	I am not familiar with the topic of the discourse.	3.66, 0.95, *VA*
17	The interlocutor shows signs such as facial expressions making me uncomfortable.	3.66, 1.06, *VA*
12	I don't know the answer to a question.	3.64, 1.03, *VA*
10	I don't know the word(s) for saying something.	3.64, 0.94, *VA*
19	The interlocutor asks me a difficult question(s).	3.62, 0.95, *VA*
11	The interlocutor asks me a question where I am not prepared to answer.	3.51, 1.02, *VA*
13	The interlocutor uses a word(s) or phrase(s) I am unfamiliar with.	3.50, 0.99, *VA*
5	I am not familiar with the interlocutor's accent.	3.43, 0.98, *MA*
16	I cannot use the word(s) correctly.	3.35, 0.93, *MA*
20	The interlocutors talk about a specific topic(s).	3.32, 0.95, *MA*
15	It is my turn to speak.	3.27, 0.93, *MA*
1	The interlocutor is a proficient speaker of English.	3.26, 1.00, *MA*
2	The interlocutor speaks with a native-like accent.	3.24, 0.96, *MA*
8	There are two or more interlocutors.	3.22, 0.99, *MA*
3	My accent is difficult for the other interlocutor to understand.	3.21, 0.95, *MA*
18	The interlocutor corrects my utterance(s).	3.03, 0.97, *MA*
6	The interlocutor speaks with a non-native accent.	2.86, 0.87, *MA*

*VA – Very anxious; MA – Moderately anxious

In this study, the item on 'interlocutor seems unwilling to communicate' was the highest anxiety situation out of class and was found to be different from what Wilang and Singhasiri (2017) reported in their study, in which students are apprehensive of interlocutors who speak fast and when they cannot understand the meaning behind an utterance. The contrasting result could be due to exposure to different people and their cultures. In the current study, the engineering students were from a university in Northeast Thailand. In contrast, the participants in the earlier study were Thai and international students enrolled in various programs in different universities in the capital city of Thailand. There is a high probability that universities located in Thai provinces are less likely to attract international students than those higher education institutions in cosmopolitan cities. Thus, universities may find ways to expose students to become culturally aware. With enough exposure, students as interlocutors make a better judgment when another interlocutor seems unwilling to communicate with them.

Other findings parallel with previous research are items 9, 'I cannot understand the meaning behind an utterance' and 4, 'I cannot decode the interlocutor's words/phrases' (see Wilang & Singhasiri, 2017). Similar to the above, this could be explained by a lack of exposure and familiarity with people's spoken English language. Content and language teachers could design in-class activities that may help students become more exposed and familiarized with Englishes. For example, listening activities include

authentic spoken recordings. Also, selected reading texts must consist of both native and non-native authors.

Are there significant relationships between and among year level, specific and general perceived English proficiency level, in-class speaking anxiety, and out-of-class anxiety?

Table 3 shows significant relationships among the variables except for year level and perceived speaking proficiency, year level and perceived writing proficiency, year level and perceived English language proficiency, year level and in-class anxiety, and year level and out-of-class anxiety.

Significant relationships were established between in-class anxiety and skill-specific English language proficiency, out-of-class anxiety and skill-specific English language proficiency, in-class anxiety and general English language proficiency, and out-of-class anxiety and general English language proficiency.

It is interesting to note the fact that in-class anxiety has higher significant levels than out-of-class anxiety in relation to PLP, PSP, PRP, PWP and PEP. This could be related with formal and informal assessments done in class to measure the students' English proficiency level. Earlier studies have indicated the prevalence of test anxiety in the foreign language classroom (Contreras-Soto et al., 2019; Horwitz et al., 1986; Paranuwat, 2011). Future studies may explore strategies to deal with domain-specific anxiety in listening, reading, writing and speaking.

Table 3
Correlational statistics for year level, perceived skill-specific proficiency, perceived english proficiency, in-class anxiety, and out-of-class anxiety

	Year level	PLP	PSP	PRS	PWP	PEP	In-class anxiety	Out-of-class anxiety
Year level	-	.15	.63	.21**	.02	.07	.09	.07
PLP		-	.59**	.59**	.51**	.72**	.42**	.37**
PSP			-	.59**	.72**	.76**	.45**	.34**
PRP				-	.60**	.55**	.40**	.23**
PWP					-	.72**	.39**	.25**
PEP						-	.42**	.34**
In-class anxiety							-	.66**

PLP – Perceived Listening Proficiency; PSP – Perceived Speaking Proficiency; PRP – Perceived Reading Proficiency; PWP – Perceived Writing Proficiency; PEP – Perceived English Proficiency **Significant at p<.01 level*

The non-significant findings show that regardless of year level, students feel anxious at every stage of their study, where they are expected to speak English in and out of class settings. Only year level and perceived reading proficiency were found significant because of the difficulty of reading materials. As engineering students progress, they are expected to read complex and scientific texts in their final years.

Findings have also suggested that students who are anxious in-class feel the same in out-of-class settings. This could be due to similar speaking anxiety situations in both questionnaires, such as '*don't understand the teacher's words*' or '*not familiar with*

words the interlocutor is saying', '*when I am called to answer*' or '*when it is my turn to speak', speaking in front of the class*' or '*talking with two or more interlocutors*'. MacIntyre and Gardner (1981) insinuated that speaking in in-class and out-of-class settings involves cognitive processes, and with anxiety, the speaking ability of the interlocutors can be adversely affected.

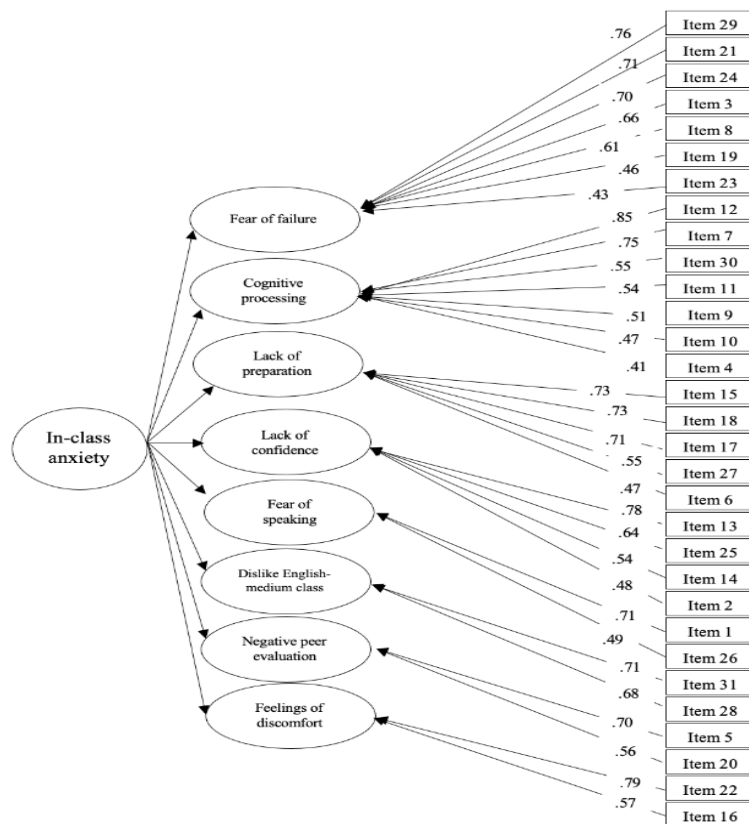**What are the factors of in-class anxiety among engineering students when English is used as medium of instruction?**

Figure 1
Factor analysis of in-class anxiety

The sampling adequacy based on the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was acceptable at .87, and Barlett's Test of Sphericity was p=.00, which is significant. Further, the cumulative variance was 67 percent, and all factor loadings were >.40. Eight factors with an eigenvalue of >1.0 were elicited from engineering students EMI context. These are: factor 1 - *Fear of failure* (Items 29, 21, 24, 3, 8, 19, and 23); factor 2 – *Cognitive processing anxiety* (Items 12, 7, 30, 11, 9,10, and 4); factor 3 –

Lack of preparation (Items 15, 18, 17, 27 and 6); factor 4 – *Lack of confidence* (Items 13, 25, 14 and 2), factor 5 – *Fear of speaking* (Items 1 and 26); factor 6 - *Dislike of the English-medium class* (Items 31 and 28); factor 7 – *Negative peer evaluation* (Items 5 and 20); and, factor 8 – *Feeling of discomfort* (Items 22 and 16).

The factors are consistent with the challenges espoused by students in EMI contexts (Belhia & Elhami, 2014; Byun et al., 2011; Galloway, 2017; Kirkgoz, 2005; Rose & Rose, 2021; Sert, 2008; Vinke, 1995; Wilang & Nupong, 2022; Yildiz et al., 2017). Also, it is not surprising to find similar factors such as fear of speaking and negative peer evaluation with that of the EFL setting because the survey was an adaptation. However, what is notable in the above factor structure was *Fear of failure*. As shown in the recent literature, FLA debilitates language performance (Metwally et al., 2022; Salwa, 2020; Sulaiman & Altakhaineh, 2021). This shows that participants were worried primarily about the content and that the language aspect of the course or lesson was secondary. However, in reality, both content and language are intertwined.

What are the factors of out-of-class anxiety among engineering students when English is used as lingua franca?

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was acceptable at .93, the Barlett's Test of Sphericity was significant at p=.00, and the cumulative variance was 65 percent. Three factors with eigenvalue of >1.0 and factor loadings above >.40 are loaded in Table 5 and are labelled according to the keywords of items in the factor loading. Factor 1 consists of items 4, 7, 9, 10, 11, 12, 13, 14, and 17 and is known as *Language processing difficulty*. Factor 2 is labelled as *Accentedness of speech* (see items 1, 2, 3, 5, 6, and 8). The last factor has items 16, 18, and 20 and is named *Fear of being corrected*.

Unlike in an in-class setting, students worry about language processing difficulty when English is used as lingua franca outside the classroom due to difficulty understanding the meaning behind utterances, unfamiliar words or phrases, an inability to express their thoughts, and unfamiliar topics of discourse, among others. Such anxiety is aggravated by accentedness of speech provoked by native or non-native speakers of English (Karci et al., 2018; Woodrow, 2006). The results are congruent with Wilang and Singhasiri's (2017) study among Thai and international students.
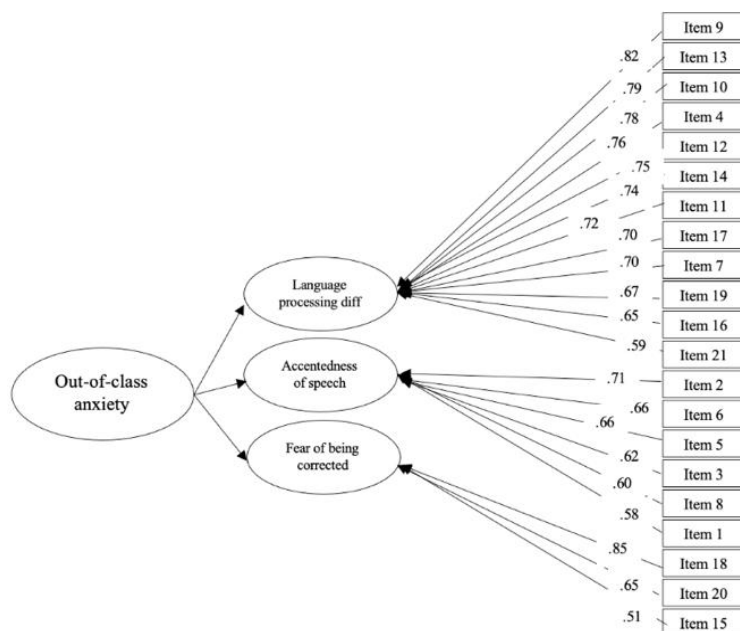
Figure 2
Factor analysis of out-of-class anxiety

CONCLUSION

The findings in the current study add to a growing body of literature pinpointing anxiety as one of the emotions that should not be neglected due to its prevalent pervasive effects, for example, content comprehension of EMI-led lessons or communication breakdown outside the classroom (Cheng, 2004; Contreras-Soto et al., 2019; Dogan, 2008; Elkhafaifi, 2005; Hewitt & Stephenson, 2011; Iscan, 2011; Kim, 2000; Liu, 2004; Metwally et al., 2022; Salwa, 2020; Sulaiman & Altakhaineh, 2021; Zhang, 2004). Specifically, the most anxiety-provoking situation in class was due to pressure to prepare very well in the English-medium class. On the other hand, out-of-class anxiety was due to the unwillingness of an interlocutor to communicate (see also Wilang & Singhasiri, 2017).

Further findings have indicated significant relationships between out-of-class and in-class anxiety, out-of-class anxiety and skill-specific English language proficiency such as listening, reading, writing, and speaking, out-of-class anxiety and general English language proficiency, in-class anxiety and skill-specific English language proficiency such as listening, reading, writing and speaking, and in-class anxiety and general English language proficiency.

Several factors were also elicited. The factor structure of in-class anxiety includes (i) Fear of failure, (ii) Cognitive processing anxiety, (iii)Lack of preparation, (iv) Lack of

confidence, (v) Fear of speaking, (vi) Dislike of the English-medium class, (vii) Negative peer evaluation, and (viii) Feeling of discomfort. Regarding the factor structure of out-of-class anxiety, findings elicited (i) Language processing difficulty, (ii) Accentedness of speech, and (iii) Fear of being corrected.

Implications for Content Teachers

One pedagogical implication for content teachers is to provide enough time for students to prepare for the task. Perhaps when the teacher offers cues for students on what is expected in the classroom in their next lesson, students could become aware of what to prepare rather than rely on their intuition of what would happen. By doing this, students could predict what teachers may ask during the lesson and may volunteer to answer questions without the teacher calling out individual names, which is a very anxiety-provoking situation in the classroom.

Another implication is promoting comprehensibility of the content lesson by helping students overcome language difficulties. When content teachers provide language scaffold to students, it may help alleviate their fear of failure and cognitive processing anxiety. For example, content teachers may explore using a corpus to elicit a list of specific words needed to help students understand the terms before the lesson. With a corpus-based generated dictionary, students are given a set of specific wordlists in each unit of a course or a more general wordlist elicited from various required reading texts in the class. Even though the EMI program is international, content teachers may offer affordances, for example, translations of specific wordlist, to scaffold the students. As mentioned earlier, language and content are intertwined and cannot be separated.

To help students prepare for out-of-class interactions, content teachers may recognize and allow varieties of English in the classroom. Perhaps telling students not to worry about 'Standardized' English could encourage students to speak without fear of being evaluated due to their accented speech. In addition, cultivating openness could expose students in the classroom to 'authentic' speakers of the English language, thereby preparing them for a multilingual world.

Implications for EMI Program Administrators

Since students cannot learn complex English-medium content without an appropriate level of English proficiency, administrators of EMI programs may have to design activities or support programs for students with low proficiency in English. They may encourage students to test their English proficiency level at the end of every semester. Preparatory courses may be encouraged. With enough preparation, students become more confident and less worried about language and content.

Administrators may encourage content and language teachers to work collaboratively in designing a preparatory course. For example, specific vocabulary for the students may be elicited before teaching the class. First, the content teacher provides the learning materials to the language teacher. Next, the language teacher explores the most appropriate corpus tool to develop wordlists. Afterwards, the list would be shared with the content teacher for consideration. Both teachers may further agree to extend

language resources to be provided, for instance, the use of concordances, to help students know the function of a word or how words are used in written scientific reports. While teaching the course, the content teacher may share outputs, for example, written report outputs, with the language teacher. This could be a better option than co-teaching, as it could interfere with learning. After the course, both teachers could evaluate the students' content and language challenges to provide further support in their regular classes.

During preparatory courses, strategies to cope with in-class and out-of-class anxieties could also be introduced. For example, administrators of EMI programs may distribute online language anxiety surveys to know the situations that provoke the students. The list could be shared with content teachers as guidelines on how to boost students' self-confidence in using English inside and outside the classroom. For instance, when students "feel pressured to prepare very well for the English-medium class," in-class and out-of-class scaffolding activities can be designed and provided. Furthermore, when the "interlocutor seems unwilling to communicate," students can be given intercultural workshops to help them become culturally-sensitive individuals.

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