



Effects of English-Medium Instruction on Students' Willingness to Communicate in L2 in EMI Universities

Jiayi Mai¹

Received: 30 October 2022 / Accepted: 5 February 2023 / Published online: 15 April 2023
© The Author(s), under exclusive licence to Springer Nature Singapore Pte Ltd 2023

Abstract

Immersive language experiences have been proven to help foster a stronger willingness to communicate (WTC) in the second language (L2). The study investigated the predictability of communication apprehension (CA) and perceived competence (PC) predictors to WTC, and changes in WTC by comparing the analysis results for year-1 and year-3 students from an English medium instruction (EMI) university in China. Quantitative and qualitative data were collected through online questionnaires and semi-structured interviews. Data analysis shows that only perceived competence was the predictor for WTC. The WTC and perceived competence were positively correlated, while there was a negative correlation between WTC and communication apprehension, perceived competence, and communication apprehension. Only the WTC differs significantly across groups, with freshmen having a much higher WTC than juniors. The results of the above statistical analysis were inconsistent with the conclusions drawn from previous empirical studies, which were further explained by the quantitative data collected from the interviews. This study's finding that the EMI context may not be as conducive to L2 WTC as other language immersion programmes has important implications for educators to adjust their policies based on the identified issues. For starters, English proficiency tests can be administered before graduation, and only those who pass will be allowed to graduate. Additionally, students should be given more language immersion opportunities after class. Furthermore, teachers from EMI colleges can try to encourage students to talk in English in class or promote the usage of English during group discussions.

Keywords Willingness to communicate · Communication apprehension · Perceived competence · English medium instruction · Language immersion

Introduction

Since the effectiveness of French immersion education in Canada has been proven, short-term or long-term language immersion programmes have been established in many areas and regions around the world, and study abroad programmes that offer similar immersive experiences also become popular. English-medium instruction (EMI) refers to giving

instruction in English in educational contexts where English is not the native language [26].

As the previous emphasis on linguistic competence has generally switched to an emphasis on communicative ability, the linguistic pedagogical field shows great interest in improving the level of the willingness to communicate (WTC) to facilitate second language (L2) acquisition. Research so far has confirmed that the language immersion experience has a positive impact on learners' willingness to WTC in L2 [9, 20]. In addition, early research identifies communication anxiety (CA) and perceived competence (PC) as the main predictors of WTC [16]. Over the years, many empirical studies like Lu and Hsu's [15] and Grant's [7] establish support for several main WTC contributing factors, such as perceived competence and communication apprehension, as well as other newly identified variables containing international posture, motivation, L2 context [15, 18, 29].

This article is part of the topical collection "Open and Innovative Learning with Technology 2022" guest edited by Billy Tak-ming Wong, Jiyou Jia, Pedro Isaias and Maximus Gorky Sembiring.

✉ Jiayi Mai
maijiyi2022@163.com

¹ English Language and Literature Studies Programme, BNU-HKBU United International College, 2000 Jintong Road, Tangjiawan, Zhuhai 519087, Guangdong, China

Only one study to date investigates changes in WTC brought by immersion experiences within a Chinese context, where potential L2 WTC drivers remain unclear, and the focus group of this study was elementary school students from grades 4 to 6 [11]. There is no research involving adult students whose L1 is Chinese and L2 is English. Moreover, little research was carried out to explore how EMI as a language immersion context influences learners' WTC in L2, while the majority of them focus on studying abroad or long-term immersion programs.

Many second language learners in English as a foreign language (EFL) contexts like China probably do not have financial support to study abroad or participate in such overseas language programs that can offer immersive English-speaking communities. Therefore, this research aims to investigate whether an EMI context in Sino-Foreign universities can also be efficient in improving learners' L2 WTC level and what the possible influential factors are. Two research questions (RQs) have been formulated to create further insight into ways to increase WTC in L2 learning. The first one is: Are perceived competence and communication apprehension also predictors of L2 WTC in the EMI context? The second one is: What influences does an EMI context have on WTC, perceived competence, and communication apprehension? What are the possible reasons for the influences? The paper is divided into five sections.

The remainder of the paper is organized in the following order. The next section is “[Literature review](#)”, followed by “[Methodology](#)” section which clarifies the research design, as well as how data was collected and analyzed. Data analysis results and the main findings are placed in “[Results and discussion](#)” section, while the contributions of the study, its limitations as well as future research directions are presented in “[Conclusion](#)” section.

Literature Review

The notion of the willingness to communicate (WTC) has gained widespread attention among researchers in the field of communication as early as the 1980s. However, research on the WTC at that time was limited to the study of speakers using their first language (L1) for communication activities. Until the mid-1990s, a group of Canadian and American scholars with a background in social psychology, communication, and linguistics began to introduce the WTC into the research field of second language (L2) acquisition, forming the current interdisciplinary research background and trend involved in the L2 WTC. As foreign language learning has been more communication-focused [24], research into the WTC has received continuous attention. MacIntyre et al. [21] put forward a heuristic model incorporating

motivational, situational, and affective variables. The latest studies were designed based on the refined model that presents the scale of potential variables influencing the L2 WTC.

WTC in L1, CA, and PC

The willingness to communicate (WTC) was first defined as the possibility to engage in communication when there was a chance [23], and this concept was used to interpret the personality variables in the process of L1 communication. McCroskey and Baer believed that WTC in L1 was essentially a stable personality trait because the individual's choice of whether to participate in communication was the result of cognitive intervention, and cognitive intervention was affected by personality. Based on this understanding, MacIntyre [16] developed a path model to explain the factors that affect the WTC in L1, and then applied the model to communication in L2. He explained that the WTC was influenced by the combined effect of perceived competence (PC) and communication anxiety (CA). Communication apprehension refers to the level of fear or anxiety that people go through when dealing with real or anticipated communication with others (McCroskey 1977, as cited in [20], p. 591). Perceived competence refers to the self-reported communicative ability in a given situation (McCroskey 1982, as cited in [20], p. 591). Subsequent studies conducted in different second language learning contexts verified that PC and CA consistently predict L2 WTC [18, 20, 29]. This study will probe whether PC and CA can be predictive variables of L2 WTC in the EMI context using data collected from a Sino-Foreign university in China.

WTC in L2

MacIntyre et al. [21] turned the concept of the L2 WTC into a model for the first time and defined L2 WTC as the willingness to communicate with a specific person at a specific time using a second language. This effectively extended the research results on L1 WTC to L2 communication. In this six-layer pyramid-shaped model, MacIntyre combined the theories and research of linguistics, communication, and social psychology and analyzed the various factors influencing L2 WTC. It was found that WTC in L2 is both affected by more permanent factors like personality traits and the immediate effects of specific situational factors including the differences in interlocutors and familiarity with the topics. On this basis, scholars have carried out relevant empirical studies on learners' WTC in L2 in combination with different L2 learning contexts, revealing the close relationship between the learner's language immersion experiences, language learning motivation, international attitudes, and the

WTC in L2. These research results are relevant to the present study in that they explored the possible influence factors of L2 WTC in the EMI context.

Theoretical Framework of Willingness to Communicate

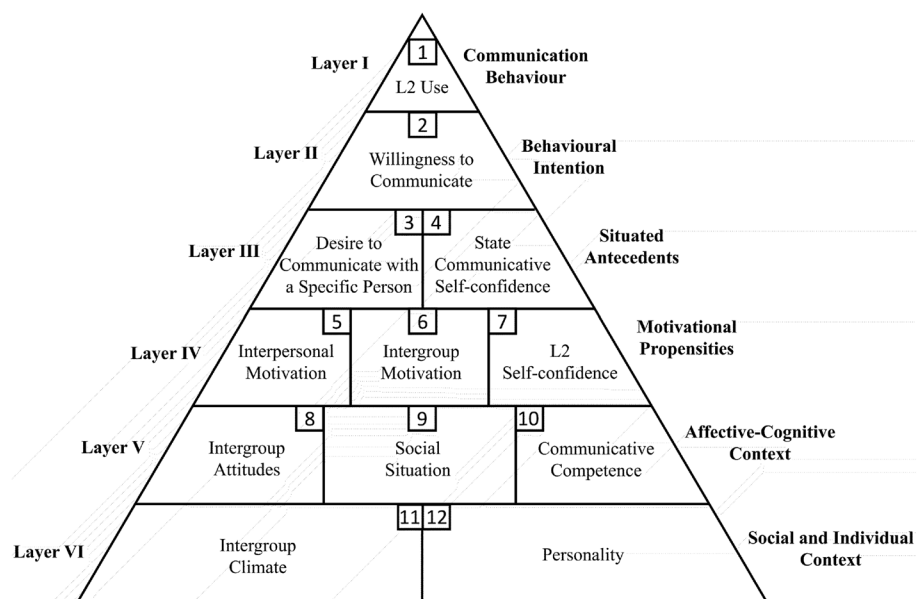
Heuristic Model of Variables Influencing WTC

MacIntyre et al. [21] proposed a six-layer pyramid model (see Fig. 1) that expanded McCroskey and Baer’s L1 WTC construct [23] and his previous study [16] from two aspects. On one hand, the WTC construct was modified to present the L2 and newfound variables were added. According to the research, more than 30 potential variables covering factors of psychology, society, communication, and linguistics are likely to affect L2 WTC. On the other hand, the authors adjusted the WTC construct to refer to an individual’s WTC at a given time. Different from the point that L1 WTC is recognized as a personality variable, WTC in L2 communication is considered a situational variable. In the EMI context, students only use English in class and mainly use their native language after school. In this case, the WTC is influenced by situational factors in the classroom setting. Twelve factors influencing L2 WTC are divided into two categories: situation-specific factors (first to third layers in Fig. 1) and stable, enduring factors (fourth to sixth layers). Situational influences refer to the impact of a specific time and a specific context on an individual, such as an individual’s desire to communicate with a specific person, or an individual’s understanding of the topic. The here and now is the focus of the sense of time [17]. Enduring and stable influencing factors refer to the sustained characteristics of

the context or individuals, which apply to almost all scenarios, such as inter-group relationships and learner personality characteristics.

Enduring Influences The sixth layer, “social and individual context”, at the bottom considers the context of communication from a broad perspective: how the relationship between society and individuals affects WTC. This layer contains two constructs, one is personality, and the other is intergroup climate. Individuals have little influence on these two factors rooted in genes [17]. The fifth layer of the model is the “affective-cognitive context”. This layer focuses on individual emotional differences, mainly involving the influence of the environment, social situations, and internal differences among groups on individual emotions, corresponding to intergroup attitudes, social situations, and communication competence. This implies that L2 learning motivation is affected by the desire of being incorporated into a language community and the social anxiety of the possible consequences of doing so, which provides a guiding direction for this study to explore the potential affective and cognitive factors of WTC that affect students in the EMI context. The fourth layer of the model focuses on motivational propensities, covering inter-individual motivation, intergroup motivation, and L2 self-confidence. Membership in the social group determines inter-group motivation, while interpersonal motivation comes from an individual’s social role in the group [17]. This part reveals the close connection within L2 self-confidence that indicates a low level of apprehension and self-perceived communication competence, motives, and roles. Issues of control and affiliation in the EMI context and how their effects function can be inferred. This section can also be used to explain how these factors

Fig. 1 Heuristic model of variables influencing WTC [21], p.156)



play a role in the WTC in a classroom situation among other factors. Situational classroom influencing factors in an EMI context may become more prevalent for learners as opposed to learners in a traditional EFL context.

Situational Influences The first three layers of the pyramid model show the situational factors at a specific time and place. Layer III focuses on situated antecedents of communication, which cover the desire to communicate with a particular individual who stands for a specific social group and state communicative self-confidence. It is the point where an individual “commits definitively to act in the L2” [17]. Clément [3] believes that self-confidence is mainly composed of two constructs: “state perceived competence” and “lack of anxiety”. MacIntyre considers state perceived competence to be the “feeling that one can communicate effectively at a particular moment” [21] and “perceived competence” in the remainder of this article has the same characteristics. State anxiety is a transient emotional reaction accompanied by tension and apprehension and is caused by autonomic nervous system arousal (Spielberger, 1983, as cited in [21], p. 549). The intensity and fluctuation of anxiety are unstable and will vary with the changes in the situation and the individual. It can be seen that language anxiety (or communication apprehension) and self-perceived communicative competence have a high correlation with WTC. In this research, this correlation will be further studied through the data collected from the questionnaire measuring students’ changes in CA, PC, and WTC in the EMI context and what leads to the result. Before the actual use of L2 on the top level, there is the last psychological preparation step represented by WTC (layer II). This level represents the choice to initiate the talk or remain quiet.

Recent Research on Willingness to Communicate

Studies Exploring Predictors and Influences of WTC in Various Contexts

Subsequent empirical studies establish support for the models and identify several predictors and a variety of influences of WTC. Grant [7] summarized WTC predictors from early studies, which argues that communication apprehension and perceived competence are high-evidence predictors of L2 WTC. These two variables were also measured in this study to check their predictability of L2 WTC in the EMI context. MacIntyre and Charos [18] and MacIntyre et al. [19] investigated students whose first language was English and whose second language was French and found that communication anxiety and perceived competence were key predictive variables of WTC. Research carried out among three groups of Korean students with different demographic characteristics suggested that in the classroom, language learning

motivation, perceived confidence, and language anxiety were important predictors of WTC [12]. In another study based on Korean students with no overseas experience, grit (perseverance of effort) and classroom enjoyment were verified to be predictors of L2 WTC [13]. A qualitative study [1] based on Bangladeshi English language learners concluded from an analysis of data collected through semi-structured interviews and classroom observations that students believed that the emphasis on grammar learning hindered the development of their oral communication skills in English and that the classroom environment significantly influenced learners’ WTC.

In addition to empirical studies, a meta-analysis of 22 selected sample papers [6] reported that language anxiety, motivation, and perceived communicative competence had a significant influence on WTC, and perceived communicative competence was identified to be the greatest predictor. Another similar study [8] adopting meta-analytic structural equation modeling drew the same conclusion and found that the relationship between L2 WTC and its high-evidence factors were greatly influenced by contexts (inside vs. outside classrooms) as well as the proficiency level.

From the foregoing, a large number of empirical studies have been conducted abroad on the predictors and influencing factors of WTC, however, the research in this area in China is still in its initial stage. The present study is expected to fill this part of the gap by exploring the predictors in the EMI context in China and the factors influencing WTC through a case study of an EMI university.

The Positive Impact of Immersion Experiences on WTC in L2

Baker and MacIntyre [2] found that students who studied in an immersive environment were more willing to communicate in L2 when given a chance than students who studied in a non-immersive French as a second language (FSL) context in Canada. A significantly higher level of PC coupled with lower language anxiety was also observed. MacIntyre et al. [20] conducted similar research and compared perceived competence, speaking anxiety, communication frequency, and WTC between immersion and non-immersion students. Components of integrativeness, motivation, and attitudes were also measured. It was verified that previous language immersion experience promoted the development of perceived competence, frequency of communication, and WTC. From the perspective of intercultural interaction, Lu and Hsu [15] investigated the differences in WTC between Chinese and American students in the US and China. Researchers found that students living abroad generally had higher levels of WTC than those living in their home countries, which again verified the beneficial effect of immersion experiences on WTC. The study conducted by Kang [9] also showed that study-abroad experiences in countries where English is the primary language led to significant improvements in EFL

learners' L2 WTC, speaking skills, and involvement in class discussions when taught by native English-speaking teachers. In Grant's research [7], he looked into the factors that contribute to and the changes in L2 WTC during a short-term intensive English programme held at a university in Macau. It was found that such programmes within the students' home country can be just as beneficial for improving L2 WTC as longer programmes that include immersion or studying abroad.

It is important to note that there is one significant difference between the overseas immersion experience and the EMI context in this study. Students involved in the study abroad programmes use L2 in and outside of the classroom, however, in the EMI university where the study was conducted, students do not use L2 after class. This paper expects to explore whether the EMI context where English is used in the classroom only can also have a positive impact on students' L2 WTC by comparing previous empirical studies on language immersion programmes.

Methodology

Research Design

A total of 120 students from four divisions, Division of Business and Management (DBM), Division of Culture and Creativity (DCC), Division of Humanities and Social Sciences (DHSS), Division of Science and Technology (DST) under an EMI University in mainland China participated in this study. The QR code of the online questionnaire was posted on WeChat moment and forwarded by students from UIC. Respondents completing and returning the questionnaire indicated their voluntary participation in the study. The sample consisted of 62 year-1 students, ten participants from each division, and 58 year-3 students, ten from each division. The two focus groups created insight into the changes in the WTC and its potential predictors, PC, and CA, after 2 years of study in the EMI context. The participants' first language (L1) is Chinese and their second language (L2) is English. This study included quantitative and qualitative data collection for answering two research questions. Quantitative data were collected by a questionnaire that measures the WTC, perceived competence, and communication apprehension of participants. Of the subjects involved in the online who volunteered to participate in the follow-up interview, eight freshmen and eight juniors were approached to complete a semi-structured interview in Mandarin to further explore and explain the factors influencing students' willingness to communicate in English in the classroom in the EMI context. The reason for combining quantitative and qualitative research was that mixed methods research can offer a more insightful meaning of the phenomena [4]. Since the courses

at the EMI University are taught in English only to provide an EMI context, the questionnaire and interview questions are designed to focus on the WTC of the students in the classroom setting.

Data Collection

Quantitative Data

The online questionnaire covered the measurement of WTC, and its expected predictors, communication apprehension, and perceived competence. All the question items were adapted from scales in the previous studies, which have been verified to show high reliability and validity, and were translated into Chinese to reduce errors due to understanding problems. Terminology that was directly related to the research focus of the study was replaced with layman's terms to avoid data bias caused by misunderstanding. For instance, the statement "the following scale is going to ask you questions about how you see your English language proficiency" was given in the perceived competence section for clarification. The five-point Likert Scale (from 1 = strongly disagree to 5 = strongly agree) is utilized in all the answers (except questions 18 and 19). Before the formal data collection procedure, a pilot test was conducted in advance. Individuals who were not in the target sample group had completed the questionnaire and answered interview questions. Then they provided feedback for future modifications of the study.

Instrumentation

- (a) Willingness to communicate: The 10 question items about WTC level in part 1 were taken from Weaver's WTC within the classroom scale [27].
- (b) Communication apprehension: Part 2 covers seven question items adapted from the work of Santos et al. [25].
- (c) Perceived competence: Question items for assessing PC apply the "self-perceived communication competence scale" from McCroskey and McCroskey [22], which covers scenarios that students may encounter in the classroom setting: four everyday communication contexts (group discussion, meetings, interpersonal conversations, public speaking), and three kinds of receivers (stranger, acquaintance, friend). Also, two questions were taken from the self-assessment grid of the Common European Framework of Reference for Languages (CEFR).

Qualitative Data

The possible reasons for the influences of EMI context on the WTC, perceived competence, and communication

Table 1 Multiple regression results for the WTC with its potential predictors, communication apprehension, and perceived competence (all data)

Model		Coefficients ^a							
		Unstandardized coefficients		Standardized coefficients	<i>t</i>	Sig.	Collinearity statistics		
		<i>B</i>	Std. error				Beta	Tolerance	VIF
1	(Constant)	1.517	0.604		2.511	0.013			
	Communication apprehension	- 0.075	0.114	- 0.055	- 0.656	0.513	0.876	1.142	
	Perceived competence	0.620	0.105	0.499	5.912	0.000	0.876	1.142	

^aDependent variable: willingness to communicate

apprehension were further explored through a semi-structured interview that asked about personal experiences of willingness to communicate in English (participants' L2) in a classroom setting at the end of the questionnaire data collection. Sixteen interviewees (two students from each division in year 1 and year 3 to ensure a representative sample) from the list of participants who agreed to participate in a follow-up interview were contacted based on the results of qualitative data with different types of characteristics. Participants signed an informed consent form before the interview, and the interview was recorded throughout. They answered questions in a given classroom setting like "When the lecturer explained the views on the topic and you have doubts about some ideas, are you willing to ask questions? Why or why not?" Juniors needed to answer three more questions about their changes in WTC, PC, and CA after 2 years of studying in the EMI context. Each interview lasted for 15 to 20 min.

Data Analysis

Quantitative data analysis was run in SPSS to manage descriptive and inferential statistics. For reliability analysis, Cronbach's alpha of WTC, perceived competence, and communication apprehension measured the consistency and reliability of the data. Multiple regression analysis was conducted to reveal the predictability of perceived competence and communication apprehension to WTC. Research question 1 was answered by the statistical results. Pearson correlation was applied to explore the relationship among the aforementioned variables and whether they were positively correlated or negatively correlated. The significance of the differences between WTC, CA, and PC among divisions was determined by one-way ANOVA. Changes in the WTC perceived competence, and communication apprehension throughout 2 years of study in the EMI context will be determined by calculating repeated *t* tests. The first part of research question 2, which asks about the influences of EMI context on WTC, perceived competence, and communication apprehension can be answered.

Qualitative data collected from the interview was managed following the procedure below. Recordings of interviews were first transcribed, then qualitative content analysis [5] was used and there were two coding phases. NVIVO was used for organizing data and presenting patterns. The initial coding phase involved reading and categorizing the raw data. In the second-tier coding phase, the data was re-evaluated and organized into themes to identify patterns from the segments that were labeled during the initial coding stage. Possible themes were inducted from the data and referenced MacIntyre's heuristic model [21]. Lastly, the categories that emerged from the second-tier coding were compared to the survey data to offer explanations for the changes in WTC, perceived competence, and communication apprehension. The second part of research question 2 which looked for reasons for influences was answered after the work.

Results and Discussion

Quantitative Data Analysis

The Predictability of CA and PC for WTC

Multiple regression analysis showed the predictability of perceived competence and communication apprehension for WTC. The results indicated that only the significance levels for perceived competence derived from the total data (see Table 1, beta = 0.620) as well as the year-1 data (beta = 0.417) and year-3 data (beta = 0.740) were lower than 0.05 (see tables of year-1 and year-3 data analysis results in Appendix), which made PC the only predictor of WTC in the EMI context. This finding answered the first research question which intends to figure out whether perceived competence and communication apprehension can still predict WTC in the EMI context.

Table 2 Correlation results for the WTC with its potential predictors, communication apprehension, and perceived competence (all data)

	Correlations		
	Willingness to communicate	Communication apprehension	Perceived competence
Willingness to communicate			
Pearson correlation	1	- 0.231*	0.518**
Sig. (2-tailed)		0.011	0.000
<i>N</i>	120	120	120
Communication apprehension			
Pearson correlation	- 0.231*	1	- 0.352**
Sig. (2-tailed)	0.011		0.000
<i>N</i>	120	120	120
Perceived competence			
Pearson correlation	0.518**	- 0.352**	1
Sig. (2-tailed)	0.000	0.000	
<i>N</i>	120	120	120

* $p < 0.05$, ** $p < 0.01$

Correlation Between WTC, CA, and PC

The statistical results of all data (see Table 2) and year-1 data (see “Appendix”) report that communication apprehension was negatively correlated with WTC ($p < 0.05$, $R = - 0.231$ and $p < 0.05$, $R = - 0.311$) and perceived competence ($p < 0.01$, $R = - 0.352$ and $p < 0.01$, $R = - 0.456$), indicating that the lower the communication apprehension, the higher the perceived competence and the WTC. On the other hand, there was a significant positive correlation between perceived competence and WTC ($p < 0.01$, $R = 0.518$ and $p < 0.01$, $R = 0.418$), which meant that the level of the WTC rose as PC went up.

According to year-3 data analysis results (see “Appendix”), perceived competence and WTC were also positively correlated ($p < 0.01$, $R = 0.613$), and perceived competence and communication apprehension were negatively correlated ($p < 0.05$, $R = 0.267$). However, unlike the previous two sets of results, communication apprehension was not correlated with WTC here ($p > 0.05$).

Significance of the Differences Between WTC, CA, and PC Among Divisions

One-way ANOVA was conducted to see whether there is an impact of the curriculum of different divisions on WTC, perceived competence, and communication apprehension. The significance levels for WTC, communication apprehension, and perceived competence among divisions in both statistical analyses of year-1 and year-3 data sets (see “Appendix”) were greater than 0.05. This meant that the levels of WTC, communication apprehension, and perceived competence did not differ significantly among the divisions.

Significance of the Differences Between WTC, CA, and PC Between Years

t-Test results for the WTC, communication apprehension, and perceived competence between year-1 and year-3 students (see Appendix) confirm that only WTC differed significantly between groups and that freshmen had a considerably higher WTC level than juniors (mean = 3.5532 > mean = 3.0466). Moreover, there was no significant difference in communication apprehension and perceived competence between freshman and junior students since the significance levels for the measured factors were all higher than 0.05.

Those findings did not meet the expectations that 2 years of English immersive study in the EMI context could contribute to the improvement in WTC, lower communication apprehension level, and higher perceived competence. The reasons behind the phenomenon will be further elucidated in the qualitative analysis section.

Qualitative Data Analysis

Table 3 summarizes the factors mentioned by the subjects in the interview that influenced their willingness to communicate and the reasons that result in the influence of the factors in the EMI classroom, which gave answers to the second question that tries to identify what influences an EMI context have on WTC, perceived competence, and communication apprehension and what are the possible reasons for the influences. The impact factors involved in the subjects' responses can be roughly divided into two categories: intrinsic and extrinsic factors, indicating that both more stable personality traits or other psychological effects and less permanent situational scenarios make a difference in the learners' L2

Table 3 Factors influencing the WTC in classroom settings and the reasons that lead to the effect of the factors in the EMI context (year 3)

Categories	Factors	Reasons	Examples
Intrinsic factor	Personality traits	Introversion	Interviewer: why don't you want to talk in English very actively? No. 1: I think it's due to my personality. I don't like to interact with others
		Extroversion	I am a person who loves sharing ideas and interacting with others (no. 12)
	Foreign language learning motivation	Academic performance	I want to practice my oral skills so that I may get a higher GPA or higher score in IELTS (no. 5) My GPA has been relatively stable. I don't bother to spend my time and effort in classroom interaction (in English) (no. 2)
		The need to have good oral skills in future study or career	Practicing English speaking will benefit me when studying abroad or working in a company later (no. 8)
		Leaving a good impression on the teachers	I want to impress the teachers in class (no. 12)
		Little need to use English outside the classroom	My speaking level can meet the basic need, and we don't need to use English after class (no. 17)
	Self-confidence	Perceived competence	My English is not that good, so I am afraid of not being fluent or making mistakes (no. 16)
		Master of content knowledge	I'm more active if I'm doing well in class, and I don't speak much if I'm not (no. 7)
		Time to get prepared	I have no problem speaking after a group discussion, but impromptu speech is challenging for me because there is no time to get prepared (no. 11)
	Respect	Respect for the teachers	I don't speak because I don't want to interfere with the pace of the teacher's teaching (no. 4)
		Respect for the classmates	I don't usually ask questions of my classmates. I don't want to seem prickly and mean (no. 1)
	Responsibility	Responsibility as a Member of the Team	(When the representative of the group does not give a good answer,) I will stand up and help her because as a member of the group I have a responsibility to help my group member (no. 3)
	Extrinsic factor	Immersive language environment	English medium instruction
English material reading requirements			There are always lots of reading assignments after class and the language input is rich (no. 9)
Focus on communicative competence			After I came here, I found that the teacher didn't care so much about grammar, as long as you express your meaning clearly. This makes me more courageous to answer questions (no. 15)
Opportunities for oral practice			Presentations are quite helpful in practicing English speaking (no. 16)
Little help from content course to improve communicative competence			The content courses have little to do with improving my speaking skills, so I feel that my oral skills do not change much (no. 8)
Teaching style		No mandatory requirement to communicate in English	Because it is not mandatory to speak English except in class, so more often than not we speak Chinese (no. 13)
		Supportive and encouraging teaching style	Foreign teachers seem to be better at encouraging students. I would be more active in their classes (no. 6)
		Strict and critical teaching style	Some teachers are so strict that I do not dare to speak at all in their classes for fear of being scolded by them (no. 11)
Conversational environment		Familiarity	After I become familiar with my classmates, I am less nervous to speak in English and answer more questions (no. 16) I think I am more courageous to answer questions in the free elective classes because I am not afraid of making mistakes if I don't know anyone (no. 2)
		Ease of conversation	The atmosphere is very relaxing (in English speaking corner), and I feel that I can chat casually, so I dare to talk more (no. 14)
		Number of audiences/interlocutors	I'm sure I'll be nervous to speak in front of the class, but if I just speak in front of the group, I'll be fine (no. 15)
Topic		Difficulty	Some topics are very abstract and difficult to understand, such as the topics of ethics courses, and I don't know how to answer (no. 7)
		Importance	If it is a discussion in a major course that can benefit me in my future career, I will participate more actively (no. 6)
	Personal interest	I will be more active if I am interested in the topic (no. 3)	

willingness to communicate. This is consistent with the current theoretical division of WTC in academia.

Extrinsic Factors

This category is the focus of the analysis because the purpose of this study is to explore the factors in the EMI context that can affect WTC. According to the qualitative content analysis, immersive language environment, teaching style, conversational environment, and topic were identified as extrinsic influential factors.

Changes in students' WTC, communication apprehension, and perceived competence could be observed mainly from their responses about language immersion in the EMI context. All of the junior participants reported that the language immersion provided by the EMI context, such as the language input from the instructors during class, the reading assignments they were given after class, and the English signs everywhere on campus, made them familiar with English and much less fearful of using it. Besides, speeches, presentations, and classroom interaction allow more opportunities for oral practice. The focus on communicative competence instead of pronunciation and grammar can also be effective in relieving students' anxiety. A participant (no. 15) made a very good comment by saying, "After I came here, I found that the teacher didn't care so much about grammar, as long as you express your meaning clearly. This makes me more courageous to answer questions. (我来了之后发现这边的老师其实没有很在乎语法, 只要你能表达清楚意思就行。这让我更敢于回答问题了). Overall, students' communication apprehension levels decreased significantly due to their increased familiarity with English. However, nearly half of the year-3 subjects felt that the language input was not very helpful in improving their English communicative skills because there was always one-way output in the classroom and most students were reluctant to take the initiative to speak in the absence of a mandatory requirement to speak English. Little communicative practice resulted in them not feeling a significant improvement in their speaking skills after two years of study in the EMI context. The perceived competence level of students generally did not grow much. When asked about the change in willingness to communicate, subjects also tended to answer that there was no remarkable increase for the same reasons mentioned above, though they were indeed less anxious about English language use. This explains why communication apprehension fails to predict year-3 students' WTC and why communication apprehension was not correlated with WTC in the year-3 data set.

The difficulty and importance of the topic and students' personal interest in the topic may all have an impact on L2

WTC in class. If the content of the topic is not difficult, the topic is closely related to future development, or students have a strong interest in a specific topic, they are likely to show stronger WTC. Teaching styles also lead to changes in students' L2 WTC. Interviewee no. 6 mentioned that Western teachers are usually more encouraging and supportive in class, patiently guiding their students to participate in rich classroom interactions. However, Chinese teachers prefer more efficient instruction, which may lead to neglect of interaction. In addition, strict, demanding teachers can put a lot of pressure on learners and lower their WTC. In the conversational environment, familiarity with the class environment, ease of conversation, and numbers of audiences or interlocutors are the possible influencing variables of the WTC in L2. Regarding familiarity with the conversational environment, a significant number of respondents stated that they were more active in speaking in unfamiliar classroom settings, such as in free elective classes, because they were less afraid of making mistakes in front of strangers and more willing to speak up. This is an interesting finding, as we usually subconsciously assume that students are more willing to communicate in a familiar environment.

Intrinsic Factors

The intrinsic contributing factors include personality traits, foreign language learning motivation, self-confidence, respect for others, and a sense of responsibility. In this section, freshman and junior subjects gave many similar answers. This is probably because the enduring factors covering personality traits and intergroup climate at layer VI, affective and cognitive factors at layer V, and motivation and L2 self-confidence at layer IV of the MacIntyre heuristic model [21] do not change significantly over time as a result of language immersion.

Here I would like to focus on the difference between the psychological state of junior students after two years of study in the EMI context and that of freshmen. During the interviews, the freshman participants demonstrated strong motivation to learn a foreign language. Although the interview data indicated that their communication apprehension was stronger than that of the juniors, they still mentioned several times that they were willing to overcome their fears to actively participate in classroom interactions to improve their speaking skills or to perform better academically. A freshman respondent (no. 5) mentioned, "I chose EMI university to improve my English proficiency level, so I always answer questions actively to practice in class" (我选择全英教学的学校就是想提升英语水平, 所以我上课总是很积极, 想着锻炼自己). In contrast, many of the juniors showed

a low willingness to communicate. They felt that since their grades were relatively stable and would not improve much with effort, and the need to use English after class was minimal, they simply did not need to take the trouble to actively communicate in English. A student (no. 7) believed that his speaking level could already meet the basic need, and he did not need to use English after class. This gives an answer to the question of why freshman students have a stronger WTC in L2 than juniors, and there is no evident enhancement in perceived competence. These details are different from the results obtained by other empirical research on short-term or long-term immersive language programmes and show some characteristics of WTC within this specific case study. From the responses indicating a significant increase in WTC, it is clear that students who are more motivated to learn a foreign language and more willing to take the initiative to speak have a significant increase in perceived competence after two years of study in the EMI context. This suggests that the language immersion environment provided by the EMI context is beneficial, however, the ultimate positive outcome depends on whether the students themselves can take advantage of the opportunities provided.

Conclusion

By comparing the analytic findings for year-1 and year-3 students from an EMI university in China, the study evaluated the predictability of communication apprehension and perceived competence to the willingness to communicate in L2, as well as changes in willingness to communicate and reasons for the changes. An online questionnaire and a semi-structured interview were used to collect quantitative and qualitative data. Only perceived competence was found to be a predictor of WTC in a multiple regression analysis. The WTC had a positive link with perceived competence, as well as a negative correlation with communication apprehension according to the Pearson correlation test. Perceived competence and communication apprehension were also found to be negatively correlated. Although the results of the statistical analysis were not entirely consistent with the findings of the previous studies, the qualitative analysis provided some possible explanations for the patterns presented. The language immersion provided by the EMI context was significantly helpful in reducing students' communicative apprehension, however, there was no significant positive effect on our expected enhancement of WTC, nor was there a significant increase in perceived competence. Referring to the extrinsic factors summarized, the long-term exposure to the English environment led to increased familiarity with English, so junior students generally reported that they were less nervous when speaking English compared to freshmen. However, the junior subjects did not show a stronger level

of perceived competence due to little actual classroom interaction. Regarding the intrinsic factors, the willingness to communicate in English was even lower among the juniors than the freshmen due to their relatively stable grades and less need to use English after class.

EMI institutions are advertised as fostering interest in learning English, increasing students' foreign language learning motivation, and improving speaking skills by providing language immersion, but in practice, this may not be the case because learners do not always actively engage in language interaction as expected. In addition, the effect of English language immersion on benefiting the WTC is not very significant as students are still basically in a Chinese context after class. The results of the data analysis and the issues mentioned above have pedagogical implications for EMI universities. The negative correlation between communication apprehension and L2 WTC in classroom settings highlights the need for lecturers to adopt a variety of teaching methods and approaches to help reduce L2 learners' anxiety [10]. This can include using engaging and interesting L2 activities and tasks or creating a supportive and enjoyable classroom environment [8]. For instance, some interviewees mentioned that they were more relaxed and more willing to ask or answer questions if the lecturers were friendly and supportive. A comfortable and non-intimidating atmosphere for L2 communication can help them shift from negative to positive mindsets [13]. Giving students an encouraging look or sincere praise in a timely manner can be an effective method. The results of the qualitative data analysis also indicated that enhancing language immersion and increasing students' familiarity with the second language could also reduce their anxiety levels. An example is changing all signs and notices on campus to English.

The important role of perceived competence in predicting L2 WTC implies that teachers should aim to make L2 learners feel confident and proficient in their L2 abilities and raise their self-confidence in communication by using different teaching strategies and skills [28]. Some students said that they might be hesitant to communicate in English in a class that strictly emphasizes English grammar and accent, worrying about being criticized by the teacher and ridiculed by their classmates. Studies have shown that excessive attention to grammatical knowledge in English learning is a major obstacle for students to use English [1, 14]. Therefore, lecturers should prioritize content and communication over pronunciation and fluency to create an environment where mistakes are accepted and even encouraged, as it will help students feel more comfortable and confident when communicating.

Students' learning needs are also identified an essential factor in driving them to increase the WTC level and the frequency of L2 use. Teachers may consider preparing more moderately difficult topics that meet students' interests and

needs before the class. Universities can provide students with specialized resources such as practicing speaking, guidance on overseas graduate school applications, and job searches that can support their L2 needs [28].

It is important to note that these findings should be considered in the context of the limitations of the study. Firstly, the sample size is relatively small since it is a case study, and the participants were only selected from one EMI University in China. Although the sample showed a certain degree of representativeness, a wider range of research subjects is not covered. Future studies might enlarge the sample size and expand the range of student samples to different regions and universities, so that the reliability and credibility of the research will be higher. Secondly, one limitation of the study's sampling method is that participation was voluntary, which could skew the results because the data were only collected from students with high WTC, while students with low WTC did not participate and their data were not included. Future research might consider direct sampling methods based on appropriate proportions as an alternative to voluntary participation. Thirdly, the questionnaire of this study was compiled on the basis of previous studies. Although the question items have been modified

according to the situation of Chinese students, they have not been tested many times and they may not be authoritative enough. In addition, since the question items were translated from English to Chinese, the respondents could encounter understanding bias when reading the questions, resulting in data errors. To reduce this risk, multiple pilot testing could be used for modifying the vocabulary choices based on the feedback of the subjects. Fourthly, this study only discusses the two most important predictors of WTC, perceived competence and communication apprehension, and excludes other important predictive variables such as motivation and international posture. Moreover, the WTC within the classroom is emphasized, and the WTC of the students after class is neglected. In future research, more predictors underlying WTC and WTC of students outside the classroom should also be covered.

Appendix: Tables of Quantitative Data Analysis

See Tables 4, 5, 6, 7, 8, 9, 10 and 11.

Table 4 Multiple regression results for the WTC with its potential predictors, communication apprehension, and perceived competence (year-1 data)

Coefficients ^a								
	Model	Unstandardized coefficients		Standardized coefficients	<i>t</i>	Sig.	Collinearity statistics	
		<i>B</i>	Std. error				Beta	Tolerance
1	(Constant)	2.808	0.921		3.047	0.003		
	Perceived competence	0.417	0.158	0.348	2.648	0.010	0.792	1.262
	Communication apprehension	- 0.194	0.167	- 0.153	- 1.164	0.249	0.792	1.262

^aDependent variable: willingness to communicate

Table 5 Multiple regression results for the WTC with its potential predictors, communication apprehension, and perceived competence (year-3 data)

Coefficients ^a								
	Model	Unstandardized coefficients		standardized coefficients	<i>t</i>	Sig.	Collinearity statistics	
		<i>B</i>	Std. error				Beta	Tolerance
1	(Constant)	0.481	0.753		0.638	0.526		
	Perceived competence	0.740	0.132	0.621	5.624	0.000	0.928	1.077
	Communication apprehension	0.043	0.147	0.032	0.289	0.773	0.928	1.077

^aDependent variable: willingness to communicate

Table 6 Correlation Results for the WTC with its Potential Predictors, Communication Apprehension, and Perceived Competence (Year-1 Data)

	Correlations		
	Willingness to communicate	Communication apprehension	Perceived competence
Willingness to communicate			
Pearson correlation	1	− 0.311*	0.418**
Sig. (2-tailed)		0.014	0.001
<i>N</i>	62	62	62
Communication apprehension			
Pearson correlation	− 0.311*	1	− 0.456**
Sig. (2-tailed)	0.014		0.000
<i>N</i>	62	62	62
Perceived competence			
Pearson correlation	0.418**	− 0.456**	1
Sig. (2-tailed)	0.001	0.000	
<i>N</i>	62	62	62

* $p < 0.05$, ** $p < 0.01$

Table 7 Correlation results for the WTC with its potential predictors, communication apprehension, and perceived competence (year-3 data)

	Correlations		
	Willingness to communicate	Communication apprehension	Perceived competence
Willingness to communicate			
Pearson correlation	1	− 0.134	0.613**
Sig. (2-tailed)		0.315	0.000
<i>N</i>	58	58	58
Communication apprehension			
Pearson correlation	− 0.134	1	− 0.267*
Sig. (2-tailed)	0.315		0.042
<i>N</i>	58	58	58
Perceived competence			
Pearson correlation	0.613**	− 0.267*	1
Sig. (2-tailed)	0.000	0.042	
<i>N</i>	58	58	58

* $p < 0.05$, ** $p < 0.01$

Table 8 One-way ANOVA results for the WTC with its potential predictors CA and PC among divisions (year-1 data)

	Sum of squares	df	Mean square	F	Sig.
Willingness to communicate					
Between groups	2.789	3	0.930	1.463	0.234
Within groups	36.866	58	0.636		
Total	39.654	61			
Communication apprehension					
Between groups	0.193	3	0.064	0.153	0.927
Within groups	24.367	58	0.420		
Total	24.560	61			
Perceived competence					
Between groups	0.853	3	0.284	0.616	0.607
Within groups	26.736	58	0.461		
Total	27.589	61			

Table 9 One-way ANOVA results for the WTC with its potential predictors CA and PC among divisions (year-3 data)

	Sum of squares	df	Mean square	F	Sig.
Willingness to communicate					
Between groups	2.178	3	0.726	0.784	0.508
Within groups	50.026	54	0.926		
Total	52.204	57			
Communication apprehension					
Between groups	0.768	3	0.256	0.483	0.695
Within groups	28.618	54	0.530		
Total	29.386	57			
Perceived competence					
Between groups	0.676	3	0.225	0.337	0.799
Within groups	36.103	54	0.669		
Total	36.779	57			

* $p < .005$, ** $p < 0.01$

Table 10 Descriptive statistics for the WTC with its potential predictors, communication apprehension, and perceived competence between years

	Group statistics				
	Year	N	Mean	Std. deviation	Std. error mean
Willingness to communicate	Year 1	62	3.5532	0.80627	0.10240
	Year 3	58	3.0466	0.95701	0.12566
Communication apprehension	Year 1	62	3.2995	0.63452	0.08058
	Year 3	58	3.4335	0.71802	0.09428
Perceived competence	Year 1	62	3.3237	0.67252	0.08541
	Year 3	58	3.2685	0.80327	0.10547

Table 11 t-Tests results for the WTC with its potential predictors, communication apprehension, and perceived competence between years

	Independent samples test								
	Levene's test for equality of variances		t-test for equality of means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
								Lower	Upper
Willingness to communicate									
Equal variances assumed	1.274	0.261	3.144	118	0.002	0.50667	0.16118	0.18750	0.82585
Equal variances not assumed			3.126	111.777	0.002	0.50667	0.16210	0.18549	0.82786
Communication apprehension									
Equal variances assumed	0.441	0.508	-1.085	118	0.280	-0.13396	0.12351	-0.37855	0.11063
Equal variances not assumed			-1.080	113.901	0.282	-0.13396	0.12403	-0.37966	0.11174
Perceived competence									
Equal variances assumed	1.276	0.261	0.410	118	0.683	0.05526	0.13492	-0.21192	0.32244
Equal variances not assumed			0.407	111.473	0.685	0.05526	0.13572	-0.21366	0.32418

Acknowledgements This paper is a revised version of the final year project for the author's BA in English Language and Literature Studies (ELLS) Programme. The early version of this manuscript was presented at the 2022 International Conference on Open and Innovative Education (ICOIE2022). I would like to express my sincere gratitude to my supervisor, Dr. Freek Olaf de Groot, for his valuable instructions and great support. I greatly appreciate the help from Dr. Edith Mei-Yee YAN and Dr. Malila Carvalho de Almeida Prado from ELLS Programme, for their assistance with the language, organization and ideas.

Data availability The survey and interview data that support the findings of this study are available upon request from the corresponding author majiyai2022@163.com. Access to the data will be granted upon completion of a data access agreement, which outlines the terms and conditions of data use. The data are stored in a password-protected cloud disk OneDrive and are available in CSV and audio format. The survey and interview data can be used for research purposes only and cannot be shared with third parties without permission from the authors.

Declarations

Conflict of interest Author Jiayi Mai declares that she has no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

References

- Alam MR, Ansarey D, Abdul Halim H, Rana MM, Milon MRK, Mitu RK. Exploring Bangladeshi university students' willingness to communicate (WTC) in English classes through a qualitative study. *Asian-Pac J Second Foreign Lang Educ.* 2022;7(1):1–17.
- Baker SC, MacIntyre PD. The role of gender and immersion in communication and second language orientations: role of gender and immersion. *Lang Learn.* 2003;53(S1):65–96. <https://doi.org/10.1111/0023-8333.00224>.
- Clément R. Second language proficiency and acculturation: an investigation of the effects of language status and individual characteristics. *J Lang Soc Psychol.* 1986;5(4):271–90.
- Creswell JW. *Educational research: planning, conducting, and evaluating quantitative and qualitative research.* 4th ed. Pearson; 2012.
- Dörnyei Z. *Research methods in applied linguistics: quantitative, qualitative, and mixed methodologies.* Oxford: Oxford University Press; 2007.
- Elahi Shirvan M, Khajavy GH, MacIntyre PD, Taherian T. A meta-analysis of L2 willingness to communicate and its three high-evidence correlates. *J Psycholinguist Res.* 2019;48(6):1241–67. <https://doi.org/10.1007/s10936-019-09656-9>.
- Grant S. Effects of intensive EFL immersion programmes on willingness to communicate. *Lang Learn J.* 2020;48(4):442–53. <https://doi.org/10.1080/09571736.2017.1422274>.
- Jin S, Lee H. Willingness to communicate and its high-evidence factors: a meta-analytic structural equation modeling approach. *J Lang Soc Psychol.* 2022;41(6):716–45.
- Kang D. The effects of study-abroad experiences on EFL learners' willingness to communicate, speaking abilities, and participation in classroom interaction. *System (Linköping).* 2014;42:319–32. <https://doi.org/10.1016/j.system.2013.12.025>.
- Khajavy GH, Ghonsooly B, Hosseini Fatemi A, Choi CW. Willingness to communicate in English: a microsystem model in the Iranian EFL classroom context. *TESOL Q.* 2016;50(1):154–80.
- Knell E, Chi Y. The roles of motivation, affective attitudes, and willingness to communicate among Chinese students in early English immersion programs. *Int Educ.* 2012;41(2):66.
- Lee JS, Lee K. Role of L2 motivational self system on willingness to communicate of Korean EFL University and secondary students. *J Psycholinguist Res.* 2020;49(1):147–61. <https://doi.org/10.1007/s10936-019-09675-6>.
- Lee JS. The role of grit and classroom enjoyment in EFL learners' willingness to communicate. *J Multiling Multicult Dev.* 2022;43(5):452–68.
- Lou NM, Noels KA. Promoting growth in foreign and second language education: a research agenda for mindsets in language learning and teaching. *System (Linköping).* 2019;86: 102126.
- Lu Y, Hsu C. Willingness to communicate in intercultural interactions between Chinese and Americans. *J Intercult Commun Res.* 2008;37(2):75–88. <https://doi.org/10.1080/17475750802533356>.
- MacIntyre PD. Variables underlying willingness to communicate: a causal analysis. *Commun Res Rep.* 1994;11:135–42.
- MacIntyre PD. Willingness to communicate in the second language: Understanding the decision to speak as a volitional process. *Mod Lang J (Boulder, Colorado).* 2007;91(4):564–76. <https://doi.org/10.1111/j.1540-4781.2007.00623.x>.
- MacIntyre PD, Charos C. Personality, attitudes, and affect as predictors of second language communication. *J Lang Soc Psychol.* 1996;15(1):3–26. <https://doi.org/10.1177/0261927X960151001>.
- MacIntyre PD, Baker SC, Clément R, Conrod S. Willingness to communicate, social support, and language-learning orientations of immersion students. *Stud Second Lang Acquis.* 2001;23(3):369–88. <https://doi.org/10.1017/S0272263101003035>.
- MacIntyre PD, Baker SC, Clement R, Donovan LA. Talking in order to learn: willingness to communicate and intensive language programs. *Can Mod Lang Rev.* 2003;59(4):589–607. <https://doi.org/10.3138/cmlr.59.4.589>.
- MacIntyre PD, Clément R, Dörnyei Z, Noels KA. Conceptualizing willingness to communicate in a L2: a situational model of L2 confidence and affiliation. *Mod Lang J (Boulder, Colorado).* 1998;82(4):545–62. <https://doi.org/10.1111/j.1540-4781.1998.tb05543.x>.
- McCroskey JC, McCroskey LL. Self-report as an approach to measuring communication competence. *Commun Res Rep.* 1988;5(2):108–13. <https://doi.org/10.1080/08824098809359810>.
- McCroskey JC, Baer JE (1985) Willingness to communicate: The construct and its measurement. Paper presented at the annual convention of the Speech Communication Association, Denver, CO
- Rodgers TS, Brown JD. *Doing second language research.* Oxford University Press; 2002.
- Santos A, Gorter D, Cenoz J. Communicative anxiety in the second and third language. *Int J Multiling.* 2017;14(1):23–37. <https://doi.org/10.1080/14790718.2017.1258980>.
- Soruç A, Griffiths C. English as a medium of instruction: students' strategies. *ELT J.* 2018;72(1):38–48. <https://doi.org/10.1093/elt/ccx017>.
- Weaver C. Using the rasch model to develop a measure of second language learners' willingness to communicate within a language classroom. *J Appl Meas.* 2005;6(4):396–415.
- Xiao Y, Qiu X. A study of the relationship between students' global perspective and willingness to communicate in English at an English medium instruction university in China. *Front Psychol.* 2022;13:873766. <https://doi.org/10.3389/fpsyg.2022.873766>

29. Yashima T. Willingness to communicate in a second language: the Japanese EFL context. *Mod Lang J* (Boulder, Colorado). 2002;86(1):54–66. <https://doi.org/10.1111/1540-4781.00136>.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.