8 Questionnaire Development and Analysis in EMI Research

A Study of EMI Learner Motivation and Attitudes

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Introduction

The emergence of English Medium Instruction (EMI) education attracts a group of language education scholars who adopt a wide range of research methodologies to investigate various EMI issues, including the effectiveness of EMI programs (e.g., Lo & Lo, 2014) and perceptions, experience, and characteristics of different stakeholders (e.g., Farrell, 2020; Pun, 2022). One popular research methodology, which is widely adopted in the current EMI literature, is questionnaire-based research (e.g., Macaro et al., 2019; Xie & Curle, 2022). While questionnaire findings depict certain features of a large population (e.g., EMI student motivation), questionnaire-based EMI research may be doubted regarding its validity and reliability. Such critiques are due to researchers' inadvertent negligence of important steps during questionnaire development, validation, and analysis procedures (Curle & Derakhshan, 2021). For example, many EMI researchers are not aware of the necessity of a pilot study, or the validity of the questionnaire is not well documented (Macaro et al., 2018).

To offer some suggestions on how to conduct questionnaire-based EMI research, this chapter reports an empirical study on Chinese EMI students' attitudes and motivation toward learning the content subject matter in English. With the EMI study as an example, the researchers intend to demonstrate specific steps in questionnaire development (Dörnyei, 2007) and methods of questionnaire validation and analysis in the pilot stage.

The Research Project

This research project is to examine and compare Chinese EMI students' motivation and attitudes toward EMI education. The role of different demographic variables (i.e., discipline, gender, study level) in EMI learner motivation is also investigated. Methodologically, it demonstrates how quantitative approaches and methods (mainly the questionnaire study) can be adopted in EMI research and how the quantitative data can be analyzed with inferential statistical analyses. The motivations behind the research project are multifold. First, along with the emergence of EMI as a vibrant research field (Macaro, 2022), a mushrooming literature has explored EMI policymaking and curriculum design as well as EMI teachers' classroom practice and continuing development (e.g., De Costa et al., 2020; Pun & Thomas, 2020; Yuan et al., 2022). While such a line of inquiry sheds light on the effective implementation and reforms of EMI in higher education, it is equally crucial to consider students' perspectives and experiences in diverse EMI programs. In particular, in view of the pivotal role of motivation in shaping students' learning choices and subsequent engagement and efforts (Gardner, 2004), there is a need to investigate students' motivation and attitudes as well as the influencing factors in EMI environments.

Second, a cluster of recent studies (e.g., Kim et al., 2017; Zhang & Pladevall-Ballester, 2022) has revealed students' positive attitudes toward EMI, their lack of self-confidence about English use, and their tendency to rely on first language (L1) in EMI classrooms. One notable limitation of these studies is their focus on students' general attitudes and motivation (e.g., about course experience and language use) without probing the complexities involved in their perceptions shaped by various demographic factors, personal dispositions, and contextual forces. For instance, Jiang et al. (2019) investigated students' motivation toward EMI in the Chinese context, and their research design and focus were primarily concerned with students' language learning needs as the major determinant of students' EMI motivation. In Macaro and Akincioglu's (2018) survey study, students' EMI motivation was examined in relation to different variables including gender, year group, and university type. Although the findings demonstrated the strong mediating effects of such factors on students' choices to enter EMI programs, the study cannot fully capture students' motivation influenced by intricate, dynamic sociocultural environments. Such a gap gives impetus to the present research project, which, informed by relevant motivational theories, looks into the complexities of students' EMI motivation in Chinese higher education settings. Particularly, our study not only focuses on the linguistic aspect of EMI (e.g., students' attitudes toward English and their language learning needs) but also treats EMI as a powerful form of educational experience, in which students' multiple types of motivation (e.g., integrative and instrumental motivation) may emerge and evolve in their situated institutional and sociocultural settings.

Third, China presents an interesting and meaningful context for EMI research given its fervent pursuit of internationalization of higher education in the past decades. As reported by Jablonkai and Hou (2023) in their recent review article on EMI in China, around 98 percent of Chinese universities have made active attempts to launch bilingual or EMI programs, while some top universities even offer over 200 EMI courses in a variety of disciplines to attract international students and enhance their level of internationalization. On the other hand, EMI is not without controversy in China. For instance, given the status of English as a Foreign Language (EFL) in China, some university teachers and students may show resistance toward EMI because it may hinder students' comprehension and application of content knowledge. Some even hold the perception that English as a colonizing and imperialist language can pose threats to the local knowledge and culture in Chinese society (Yuan, 2020). Such beliefs speak to the complexities embedded in the provision of EMI, which not only is a matter of instruction language but also intertwines with diverse intuitional, social, and cultural issues. By exploring students' motivation and attitudes toward EMI against such a complex backdrop, the project can bring relevant and practical insights to EMI teachers and university managers in both China and similar EFL settings (e.g., Japan and Korea).

Quantitative Research Design

To shed light on university students' EMI motivations and attitudes in Chinese universities, the research team adopted a mixed methods approach, which involved a large-scale questionnaire survey and follow-up case study (e.g., interviews and observations). Given the scope of the book focusing on quantitative research methods in EMI research, this chapter presents and discusses the design and implementation of a questionnaire survey with practical implications and directions for future research.

We chose to conduct the questionnaire survey based on the following reasons. First, the questionnaire survey study is cost-effective (Dörnyei & Taguchi, 2009), and it enables the team to grasp a general understanding of motivation data from EMI students in a wide range of contexts and disciplines. Second, the researchers can conduct inferential statistical analyses to examine EMI motivation and attitudes and explore the role of demographic variables within the constructs. The researchers' bias can be avoided. Third, the questionnaire survey also serves as the first stage of a larger EMI research project. Based on the findings, the researchers interviewed and observed some of the questionnaire participants to capture in-depth information about their motivational constructs (cf. the explanatory sequential design in Creswell, 2015).

Method in Detail

The Participants

In this study, the scale was administered to 541 EMI students (mean age: twenty-one years old) from three universities in China who had been learning English for more than six years. All three universities are top-tier universities in China (among the top thirty-six in the list of Double First Class Universities in China). They are located one each in northern China, middle China, and southern China because the researchers intended to avoid the potential influence of geographic variables (cf. Qiu & Xu, 2023) and depict a complete picture of Chinese EMI students' attitudes and motivation. Among the participants, 290 were male and 251 were female. Also, 328 of them were from hard science disciplines (e.g., chemistry, mechanical engineering, computer science), while 213 were from soft science disciplines (e.g., philosophy, accounting, journalism) (Becher & Trowler, 2001). The population also consisted of 348 undergraduate students and 193 postgraduate students.

Questionnaire Adaptation

The questionnaire survey consisted of two sections: demographic information of participants and a scale on EMI student motivation and attitudes. Five question items were developed to collect the demographic information of the participants, including gender, age, the tier of the university they enrolled in, their study level (bachelor's degree program, master's degree program, or doctoral degree program), and discipline.

The scale on EMI motivation was developed based on the Attitude/ Motivation Test Battery (AMTB) developed by Gardner (2004), which is based on a socioeducational model in second language (L2) research. Underlying this model, Gardner and Lambert (1972) propose that learners' attitudes toward the L2 and its speakers affect their motivation, which, as a result, imposes an impact on learner achievement. The questionnaire has been proved to be effective to measure L2 learners' attitudes and motivation (AI-Hoorie & MacIntyre, 2019; Gardner & MacIntyre, 1991). Recently, a few studies also adapted the questionnaire into Content and Language Integrated Learning contexts (e.g., Isidro & Lasagabaster, 2022) and EMI contexts (e.g., Lei & Hu, 2014).

Three dimensions of the questionnaire were adopted: (1) attitudes toward English language learning, (2) integrative motivation, and (3) instrumental motivation. Attitudes are related to "the individual's reaction to anything associated with the immediate context in which the language is taught," such as positive (favorable) or negative (unfavorable) considerations for L2 learning (Masgoret & Gardner, 2003, pp. 172–173). Integrative motivation refers to learners' openness to integrate into the community of native speakers (e.g., to appreciate the culture of native speakers), while instrumental motivation is associated with the pragmatic driving force of learning (e.g., obtaining a better job). These concepts were adapted to the EMI context in this study. Students' attitudes toward learning content knowledge in English and their integrative and instrumental orientation to EMI education were the foci.

In the 5-point Likert scale questionnaire, the researchers adapted the question items of Gardner (2004) from the context of English as a Second/Foreign Language to learning the content subject in English. To revise the question items, they first did a literature search and read through academic works related to EMI and Gardner's socioeducational model (e.g., Doiz et al., 2014; Gardner, 2010). Following the literature search, meetings were held to discuss how to adapt the question items of Gardner (2004) to the EMI context. For example, "Learning English is really great" was adapted as "Learning subject content in English is really great." Four items were developed for each dimension, and participants were asked to select whether they agreed or disagreed with each item (5 = strongly agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, 1 = strongly disagree). The question items were also translated into Chinese by the first author, and the translation was circulated among the research team for comments. One student assistant back-translated the Chinese items into English, which was compared with the original items. After revisions, the drafted questionnaire was sent to three experts in the fields of EMI and language education and two EMI teachers, who are familiar with questionnaire development, for feedback on questionnaire design, wording, and translation. Online meetings were held for researchers to clarify experts' confusion, and the questionnaire was finalized for the pilot study.

The Pilot Test

The questionnaire was piloted with 230 EMI students from a university in China, who held prior experience of attending at least one EMI course. They were recruited by their English course tutors and voluntarily participated in this study. Their consent was sought, and the research team also informed them that the data collected would be used for research purposes only and they could complete the questionnaire online anonymously. Exploratory factor analysis (EFA) and the Cronbach's alpha test were performed with the data collected. EFA is "one of a family of multivariate statistical methods that attempts to . . . identify the common factors that explain the order and structure among measured variables" (Watkins, 2018, p. 219). EFA measures the validity of a questionnaire, and the Cronbach's alpha test measures the reliability of the scale. According to Hair et al. (2010), if the Cronbach's alpha is larger than 0.9, the questionnaire demonstrates excellent reliability. Hence, the scale of this study (Cronbach's alpha = 0.956) was extremely reliable. Based on EFA, the researchers excluded one question item from each dimension because each was loaded on two different dimensions. The scale was finalized with nine question items, with three items for each dimension.

Data Collection

To collect the questionnaire data for the main study, we first contacted EMI or English course teachers who we knew about and who were working at the three universities via email. And those who were willing to help with data collection invited their students to complete the questionnaire online or sought their colleagues' help with the recruitment of participants. The research participants were expected to fulfill the following selection criteria. First, they should be full-time undergraduate or postgraduate students who had completed at least one EMI course or were taking EMI courses when the data were collected. Second, they should be learning English as their second/foreign language and speak Chinese as their first language. Before the data collection, the participants were briefed about the research project and informed of the confidentiality of their input. They were also informed that their input would not be sent to their teachers and thus would not affect their academic achievement. All participants completed the questionnaire online. We first collected the data of 561 students, but 20 were excluded after sorting out the data because their input was incomplete.

Data Analysis

The data analysis was conducted in three steps. The first one was to reconfirm the validity and reliability of the scale. Second, the correlations of the three dimensions were investigated. Third, the attitudes and motivation of EMI students with different demographic variables were examined.

Exploratory factor analysis and reliability analysis were performed with IBM SPSS Statistics software version 23 to investigate the validity and reliability of the scale. After validating the scale, we conducted a correlation analysis with SPSS software to explore the relationships between the three constructs. Independent *t*-tests were then conducted to explore the attitudes and motivation of EMI students with different demographic backgrounds, including gender (male versus female), level of study (undergraduate versus postgraduate), and disciplines (hard science versus soft science). The results are reported in the following section.

Data Reporting

Descriptive Statistics

Table 8.1 depicts the means and standard deviations for the eight question items. One question item was removed after EFA because of the cross-loadings on different question items. In general, the research participants held positive

Table 8.1 *Descriptive statistics of the scale*

Item	Mean	Standard deviation
Attitudes	**3.52**	**1.04**
1. Learning subject content in English is really great.	3.54	1.15
2. I plan to learn as much subject content in English as possible.	3.65	1.07
3. I love learning subject content in English.	3.38	1.20
Integrative orientation	**3.55**	**1.04**
4. Studying subject content in English can be important to me because it will allow me to be more at ease with native speakers of English.	3.60	1.15
5. Studying subject content in English can be important for me because it will enable me to better understand and appreciate English culture.	3.61	1.10
6. Studying subject content in English can be important for me because I will be able to participate more freely in the activities of other cultural groups.	3.43	1.16
Instrumental orientation	**3.98**	**0.92**
7. Studying subject content in English can be important for me because I will need it for my future career.	4.02	0.94
8. Studying subject content in English can be important to me because I think it will someday be useful in getting a good job.	3.94	0.99

attitudes toward content subject learning in English (Mean = 3.52) and were motivated (Mean > 3.50). A significantly higher mean score was reported on instrumental motivation (Mean = 3.98) than on integrative motivation (Mean = 3.55), $t = -12.284$, $p < 0.001$, Cohen's $d = 0.44$, which indicates that the students' EMI motivation was more likely to be driven by pragmatic reasons (e.g., job hunting). According to Cohen (1988), the thresholds for small, medium, and large effect sizes are 0.20, 0.50, and 0.80. Therefore, a small effect size is observed.

Scale Validation

The data were first input into SPSS version 23 software for EFA, which aimed at examining the validity of the scale. Eight question items relating to EMI attitudes and motivation were factor analyzed using principal components analysis with varimax rotation. Kaiser–Meyer–Olkin measure of sampling adequacy was 0.91, above the commonly recommended value of 0.6, and Bartlett's test of sphericity was significant (χ^2 (28) = 3599.940, $p < 0.001$). Three factors were requested, based on the fact that these items were adapted from three constructs: attitudes toward learning content knowledge in English, integrative motivation of learning content knowledge in English, and instrumental motivation of learning content

Table 8.2 *Factor loadings from principal axis factor analysis with varimax rotation for a three-factor solution (*N *= 541)*

Item	Factor 1	Factor 2	Factor 3	Communalities
Attitudes				
1. Learning subject content in English is really great.	0.793			0.83
2. I plan to learn as much subject content in English as possible.	0.707			0.82
3. I love learning subject content in English.	0.770			0.86
Integrative orientation				
4. Studying subject content in English can be important to me because it will allow me to be more at ease with native speakers of English.		0.765		0.81
5. Studying subject content in English can be important for me because it will enable me to better understand and appreciate English culture.		0.782		0.83
6. Studying subject content in English can be important for me because I will be able to participate more freely in the activities of other cultural groups.		0.824		0.88
Instrumental orientation				
7. Studying subject content in English can be important for me because I will need it for my future career.			0.857	0.91
8. Studying subject content in English can be important to me because I think it will someday be useful in getting a good job.			0.865	0.91
Eigenvalues	2.495	2.272	2.083	
% of variance	31.18	28.40	26.04	

Note: Loadings < 0.50 are omitted.

knowledge in English. After rotation, the first factor accounted for 31 percent of the variance, the second factor for 28 percent, and the third factor for 26 percent. Table 8.2 displays the items and factor loadings for the rotated factors, with loadings less than 0.50 omitted to improve clarity.

The first factor, which seems to index attitudes toward learning subject content in English, had strong loadings on the first three items, with positive loadings. Item 1 had the highest loading, while Item 2 had the lowest. The second factor, which is related to the integrative motivation of learning the

Table 8.3 *Correlation analysis*

	Attitudes	Integrative orientation	Instrumental orientation
Attitudes	1	0.797**	0.692**
Integrative orientation	0.797**	1	0.656**
Instrumental orientation	0.692**	0.656**	1

Note: ** means $p < 0.001$.

subject matter in English, had high loadings on Items 4–6. Item 6 had the highest loading, but the loading on Item 4 was slightly lower than on the others. The third factor, which seemed to be the instrumental motivation of learning subject content in English, loaded highly on the last two items. The loadings were similar. One question item related to instrumental motivation was excluded because it was loaded on all three factors, which was unsatisfactory. Therefore, generally speaking, the scale was effective to measure EMI students' attitudes and motivation.

The reliability of the questionnaire was also measured. Cronbach's alpha for the whole scale was 0.937, indicating excellent reliability. We also measured the reliability of different constructs. Satisfactorily, high reliability was found (attitudes = 0.894, integrative = 0.900, instrumental = 0.901). Thus, the results demonstrated that the results obtained from the scale can be replicated.

Correlation of Different Constructs

Pearson's correlation analysis was conducted to explore the relations of the three constructs, and the results are reported in Table 8.3. There were strong positive correlations (larger than 0.50) among the three constructs, implying that enhancing one of the three aspects (e.g., attitudes) would lead to higher degrees of others (e.g., integrative motivation, instrumental motivation).

Demographic Information

Independent *t*-tests were conducted to compare the attitudes and motivation of EMI students of different genders, levels of study, and disciplines. Descriptive information on gender differences is reported in Table 8.4, and the inferential statistical analysis results suggested that female students held a higher degree of positive attitudes toward learning content knowledge in English than their male counterparts with a small effect size ($t = -2.812$,

Table 8.4 *Gender differences*

	Gender	*N*	Mean	Standard deviation
Attitudes	Male	290	3.41	1.02
	Female	251	3.66	1.04
Integrative motivation	Male	290	3.44	1.04
	Female	251	3.66	1.03
Instrumental motivation	Male	290	3.87	0.91
	Female	251	4.11	0.91

$p = 0.005$, $d = 0.24$). They also had higher levels of EMI integrative motivation than male students with a small effect size ($t = -2.467$, $p = 0.014$, $d = 0.21$). The same trend was observed for instrumental motivation with a small effect size ($t = -3.017$, $p = 0.003$, $d = 0.26$).

In terms of the independent *t*-test results for undergraduate students and postgraduate students in EMI attitudes and motivation, no significant differences ($p > 0.05$) were found for the attitudes ($p = 0.344$), integrative motivation of EMI learning ($p = 0.794$), and instrumental motivation of EMI learning ($p = 0.703$). It seems that both undergraduate and postgraduate students held similar levels of positive attitudes and motivation toward learning the subject matter in English, as shown in Table 8.5.

However, disciplinary differences were spotted from the independent *t*-tests. Table 8.6 presents the means and standard deviations for different constructs and different disciplines. Soft science students held more positive attitudes toward learning content knowledge in English than their hard science counterparts with a small effect size ($t = -1.970$, $p = 0.049$, $d = 0.17$). They were also integratively and instrumentally more motivated than hard science students

Table 8.5 *Differences of study levels*

	Level	*N*	Mean	Standard deviation
Attitudes	Undergraduate	348	3.49	1.05
	Postgraduate	193	3.58	1.01
Integrative motivation	Undergraduate	348	3.55	1.03
	Postgraduate	193	3.53	1.06
Instrumental motivation	Undergraduate	348	3.99	0.89
	Postgraduate	193	3.96	0.96

Table 8.6 *Disciplinary differences*

	Gender	*N*	Mean	Standard deviation
Attitudes	Hard	328	3.45	0.99
	Soft	213	3.63	1.10
Integrative motivation	Hard	328	3.46	1.03
	Soft	213	3.67	1.04
Instrumental motivation	Hard	328	3.88	0.89
	Soft	213	4.13	0.93

with small effect sizes (integrative orientation: $t = -2.354$, $p = 0.019$, $d = 0.20$; instrumental orientation: $t = -3.051$, $p = 0.002$, $d = 0.27$).

Summary

In this questionnaire-based study, we adapted a scale on EMI students' learning attitudes and motivation and administered it to 541 students in three Chinese universities. With quantitative analyses, we validated the scale and found that the learners' positive EMI attitudes were strongly correlated with high instrumental and integrative orientations of EMI motivation. The results also revealed gender differences and disciplinary differences in EMI attitudes and motivation.

The research findings contribute to EMI research with empirical evidence of EMI students' attitudes toward learning content matter in English and two kinds of EMI motivation; these findings demonstrate the essentiality of considering learners' demographic information (i.e., gender, disciplinary backgrounds) in order to develop insights into their EMI attitudes and motivational constructs. Methodologically, this study reveals that it is possible to adapt English as foreign/second language scales to EMI contexts, but the adapted scales should be piloted and the validity and reliability need to be measured before they can be formally employed in EMI research. Pedagogically, given the positive correlations among attitudes, integrative motivation, and instrumental motivation of learning content knowledge in English, enhancing EMI students' integrative orientation of motivation may lead to higher levels of EMI attitudes and instrumental motivation and vice versa. The findings of this study also imply that there is a more urgent need to enhance the EMI attitudes and motivation of male students and those majoring in hard science disciplines because of their relatively lower attitude and motivation levels than female peers and soft science students.

Implications of Conducting EMI Questionnaire-Based Research

Questionnaire-based research is an appropriate research methodology for investigating various EMI research topics, including but not limited to EMI student motivation (Rose et al., 2020) and self-efficacy beliefs (Thompson et al., 2022). These questionnaire-based studies not only provide valid and reliable measurements for EMI scholars and language teaching practitioners but also depict a descriptive and generalizable picture of a large population. Correlation and causal relationships of different learner/teacher variables can also be examined (e.g., Soruç et al., 2022).

While the significance of questionnaire-based EMI research is acknowledged (Curle & Derakhshan, 2021), its effectiveness could be optimized by strictly following established guidelines in questionnaire development and employment (e.g., Dörnyei, 2007). This process should ideally include the creation of an item pool, selection of appropriate question items, piloting of these items, and conducting item analysis before questionnaire validation. Administering the questionnaire to different student populations and performing inferential statistical analyses on the data (e.g., EFA, the reliability test) are also necessary. It should be reminded that EFA is typically suitable for validating questionnaires in their pilot stage, as demonstrated in the current study, while confirmatory factor analysis (CFA) can be further conducted when testifying the validity of a scale in the follow-up stage. In addition, various analytical methods can be adopted to examine questionnaire data and/or investigate the relations of different variables and components. These methods include but are not limited to parametric and non-parametric tests (e.g., *t*-test, ANOVA [analysis of variance], path analysis, structural equation modeling, and facet Rasch measurement), with researchers selecting the method that is most appropriate for their specific research questions.

The questionnaire survey design can be an integral part of the mixed methods research design in educational studies (Creswell & Clark, 2017). Three models of mixed methods are proposed. The first model (the explanatory design) is that questionnaire data are collected first, which inform what kinds of qualitative data are needed to supplement and explain the quantitative results. In Qiu and Fang's (2022) mixed methods research on EMI students' perceptions of their native and nonnative English-speaking content subject teachers, the researchers first administered a questionnaire survey to 101 EMI students and 12 out of the 101 participants were interviewed on their perceptions of EMI teachers based on their input in the questionnaire survey. This is an example of the explanatory design where the interview findings reflected the reasons underlying the participants' questionnaire input.

In the second model (the exploratory design), for example, interview data with a small group of EMI students can be collected, which inform the development of larger-scale questionnaires on a related topic. Although this method is relatively rare in EMI research, Yuan and Qiu's (2023) design of their questionnaire on EMI teachers' language attitudes followed this pattern. Interviews with three EMI teachers were conducted, which served as an exploratory pilot study. The three teachers' attitudes toward L1 use in EMI classrooms also informed the development of the questionnaire survey, and the researchers integrated some of their views into the survey to explore whether the views were generally accepted by other EMI teachers in China.

The questionnaire data and the qualitative data (e.g., interview) may also be collected simultaneously (Creswell, 2015). In Baker and Hüttner's (2019) comparative study of EMI programs in Europe and Asia, the researchers surveyed 121 international students from different EMI programs in different countries (Thailand, Austria, United Kingdom) and interviewed four EMI lecturers and eight EMI students. The survey results and interview findings supplemented each other.

To conclude, this chapter discusses how questionnaire-based research can be designed in the context of EMI and how questionnaire data can be quantitatively analyzed to explore EMI students' attitudes and motivation and to reveal the different EMI attitudes and motivation degrees of students with different demographic information. It suggests that questionnaire-based studies are appropriate for EMI research, but their potential would be maximized if they could be supplemented by qualitative data.

References

AI-Hoorie, A. H., & MacIntyre, P. D. (2019). *Contemporary language motivation theory*. Bristol: Multilingual Matters.

Baker, W., & Hüttner, J. (2019). "We are not the language police": Comparing multilingual EMI programmes in Europe and Asia. *International Journal of Applied Linguistics*, *29*(1), 78–94. doi: https://doi.org/10.1111/ijal.12246

Becher, T., & Trowler, P. (2001). *Academic tribes and territories: Intellectual enquiry and the culture of disciplines* (2nd ed.). Open University Press.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York: Erlbaum.

Creswell, J. W. (2015). *A concise introduction to mixed methods research*. Thousand Oaks, CA: Sage.

Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research* (3rd ed.). Thousand Oaks, CA: Sage.

Curle, S., & Derakhshan, A. (2021). Trends in using questionnaires for EMI research: Suggestions for future improvements. In J. Pun & S. Curle (Eds.), *Research methods in English medium instruction* (pp. 32–45). New York: Routledge.

De Costa, P. I., Green-Eneix, C. A., & Li, W. (2020). Problematizing EMI language policy in a transnational world: China's entry into the global higher education market. *English Today*. doi: https://doi.org/10.1017/S026607842000005X

Doiz, A., Lasagabaster, D., & Sierra, J. M. (2014). CLIL and motivation: The effect of individual and contextual variables. *The Language Learning Journal*, *42*(2), 209–224. doi: https://doi.org/10.1080/09571736.2014.889508

Dörnyei, Z. (2007). *Research methods in applied linguistics*. Oxford: Oxford University Press.

Dörnyei, Z., & Taguchi, T. (2009). *Questionnaire in second language research: Construction, administration, and processing*. New York: Routledge.

Farrell, T. S. C. (2020). Professional development through reflective practice for English-medium instruction (EMI) teachers. *International Journal of Bilingual Education and Bilingualism*, *23*(3), 277–286. doi: https://doi.org/10.1080/13670050.2019.1612840

Gardner, R. C. (2004). *Attitude motivation test battery: International AMTB research project*. Canada: The University of Western Ontario. http://publish.uwo.ca/~gardner/docs/englishamtb.pdf.

(2010). *Motivation and second language acquisition: The socio-educational model*. New York: Peter Lang.

Gardner, R. C., & Lambert, W. E. (1972). *Attitudes and motivation in second-language learning*. Rowley, MA: Newbury House Publishers.

Gardner, R. C., & MacIntyre, P. D. (1991). An instrumental motivation in language study: Who says it is not effective? *Studies in Second Language Acquisition*, *13*(1), 57–72.

Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). *Multivariate data analysis: A global perspective* (Vol. 7). Upper Saddle River, NJ: Pearson.

Isidro, X. S., & Lasagabaster, D. (2022). Students' and families' attitudes and motivations to language learning and CLIL: A longitudinal study. *The Language Learning Journal*, *50*(1), 119–134. doi: https://doi.org/10.1080/09571736.2020.1724185

Jablonkai, R. R., & Hou, J. (2023). English medium of instruction in Chinese higher education: A systematic mapping review of empirical research. *Applied Linguistics Review*, *14*(6), 1483–1512. doi: https://doi.org/10.1515/applirev-2021-0179

Jiang, L., Zhang, L. J., & May, S. (2019). Implementing English-medium instruction (EMI) in China: Teachers' practices and perceptions, and students' learning motivation and needs. *International Journal of Bilingual Education and Bilingualism*, *22*(2), 107–119. doi: https://doi.org/10.1080/13670050.2016.1231166

Kim, E. G., Kweon, S. O., & Kim, J. (2017). Korean engineering students' perceptions of English-medium instruction (EMI) and L1 use in EMI classes. *Journal of Multilingual and Multicultural Development*, *38*(2), 130–145. doi: https://doi.org/10.1080/01434632.2016.1177061

Lei, J., & Hu, G. (2014). Is English-medium instruction effective in improving Chinese undergraduate students' English competence? *IRAL-International Review of Applied Linguistics in Language Teaching*, *52*(2), 99–126. doi: https://doi.org/10.1515/iral-2014-0005

Lo, Y. Y., & Lo, E. S. C. (2014). A meta-analysis of the effectiveness of English-medium instruction in Hong Kong. *Review of Educational Research*, *84*(1), 47–73. doi: https://doi.org/10.3102/0034654313499615

Macaro, E. (2022). English Medium Instruction: What do we know so far and what do we still need to find out?. *Language Teaching*, *55*(4), 533–546. doi: https://doi.org/10.1017/S0261444822000052

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

Macaro, E., Akincioglu, M., & Han, S. (2019 online). English medium instruction in higher education: Teacher perspectives on professional development and certification. *International Journal of Applied Linguistics*. doi: https://doi.org/10.1111/ijal.12272

Masgoret, A. M., & Gardner, R. C. (2003). Attitudes, motivation, and second language learning: A meta-analysis of studies conducted by Gardner and associates. *Language Learning*, *53*(1), 123–163. doi: https://doi.org/10.1111/1467-9922.00212

Pun, J. (2022 online). Effects of prior English exposure on Hong Kong tertiary science students' experiences in EMI learning. *RELC Journal*. doi: https://doi.org/10.1177/00336882221079057

Pun, J. K. H., & Thomas, N. (2020). English medium instruction: Teachers' challenges and coping strategies. *ELT Journal*, *74*(3), 247–257. doi: https://doi.org/10.1093/elt/ccaa024

Qiu, X., & Fang, C. (2022). Creating an effective English-Medium Instruction (EMI) classroom: Chinese undergraduate students' perceptions of native and non-native English-speaking content teachers and their experiences. *International Journal of Bilingual Education and Bilingualism*, *25*(2), 641–655. doi: https://doi.org/10.1080/13670050.2019.1707769

Qiu, X., & Xu, J. (2023). Defining oracy: Second language listening and speaking motivation in higher education and the role of demographic factors. *Psychological Reports*, *126*(1), 332–360. doi: https://doi.org/10.1177/00332941211054775

Rose, H., Curle, S., Aizawa, I., & Thompson, G. (2020). What drives success in English medium taught courses? The interplay between language proficiency, academic skills, and motivation. *Studies in Higher Education*, *45*(11), 2149–2161. doi: https://doi.org/10.1080/03075079.1590690

Soruç, A., Pawlak, M., Yuksel, D., & Horzum, B. (2022). Investigating the impact of linguistic and non-linguistic factors on EMI academic success. *System*, *107*, 102794. doi: https://doi.org/10.1016/j.system.2022.102794

Thompson, G., Aizawa, I., Curle, S., & Rose, H. (2022). Exploring the role of self-efficacy beliefs and learner success in English medium instruction. *International Journal of Bilingual Education and Bilingualism*, *25*(1), 196–209. doi: https://doi.org/10.1080/13670050.2019.1651819

Watkins, M. W. (2018). Exploratory factor analysis: A guide to best practice. *Journal of Black Psychology*, *44*(3), 219–246. doi: https://doi.org/10.1177/0095798418771807

Xie, W., & Curle, S. (2022). Success in English medium instruction in China: Significant indicators and implications. *International Journal of Bilingual Education and Bilingualism*, *25*(2), 585–597. doi: https://doi.org/10.1080/13670050.2019.1703898

Yuan, R. (2020). Promoting EMI teacher development in EFL higher education contexts: A teacher educator's reflections. *RELC Journal*, *51*(2), 309–317. doi: https://doi.org/10.1177/0033688219878886

Yuan, R., & Qiu, X. (2023). Understanding EMI teachers' language beliefs and use in content-area classrooms at Chinese universities. In P. K. Sah & F. Fang (Eds.), *EMI and linguistic diversity in Asian universities (pp. 123-138)*. New York: Routledge.

Yuan, R., Li, M., Peng, J., & Qiu, X. (2022 online). English-medium instruction (EMI) teachers as "curriculum makers" in Chinese higher education: A textual analysis. *Journal of Multilingual and Multicultural Development*. https://doi.org/10.1080/01434632.2022.2061268

Zhang, M., & Pladevall-Ballester, E. (2022). Students' attitudes and perceptions towards three EMI courses in mainland China. *Language, Culture and Curriculum*, *35*(2), 200–216. doi: https://doi.org/10.1080/07908318.2021.1979576