

Research Article

ENGLISH FOR SPECIFIC PURPOSES, ENGLISH PROFICIENCY, AND ACADEMIC ACHIEVEMENT IN ENGLISH-MEDIUM INSTRUCTION: A MEDIATION ANALYSIS

Syariful Muttaqin¹, Hsueh-Hua Chuang²¹Universitas Brawijaya, Malang, Indonesia²National Sun Yat-sen University, Kaohsiung City, Taiwan**Abstract.**

The implementation of English-Medium Instruction (EMI) at higher education institutions pose challenges for the students in achieving content mastery and improving English proficiency as the two most expected outcomes. English for Specific Purposes (ESP) is designed to provide English and learning support for EMI students in achieving the EMI “dual benefits.” This study aimed to examine the relationship between ESP, English proficiency, and academic achievement of EMI students at a university in Indonesia and the mediating effect of English proficiency on the relationship between ESP and academic achievement. This quantitative study employed empirical institutional data about ESP course grades, English proficiency scores, and the overall grade point average of 246 EMI students at a faculty of social science at a state university in Indonesia. A regression analysis using a process by Hayes was performed as the analytical tool. It was found that ESP positively predicted both EMI students’ academic achievement and English proficiency. English proficiency was shown to partially mediate the relationship between ESP and the academic achievement of the EMI students. Both ESP and English proficiency is crucial in enhancing the EMI students’ disciplinary knowledge understanding. Recommendations for more collaborations and language and learningsupports and further studies are provided.

Keywords: *English for Specific Purposes, English proficiency, academic achievement, English-Medium Instruction, higher education*

1. INTRODUCTION

English medium instruction (EMI) has been widely applied at higher education institutions around the world (Dearden, 2014) in response to higher education internationalization (Doiz, Lasagabaster, & Sierra, 2011; Dafouz & Smit, 2020) and increasing English role as a lingua franca (Crystal, 2003). EMI is defined as “The use of the English language to teach academic subjects in countries or jurisdictions where the first language (L1) of the majority of the population is not English” (Dearden, 2014). It is a dual-benefit teaching approach, aimed for both disciplinary knowledge and English language proficiency improvement (Macaro, Curle, Pun, An, & Dearden, 2018). Professionally,

Corresponding Author: Syariful Muttaqin; email: smuttaqin@ub.ac.id

Published 27 April 2023

Publishing services provided by Knowledge E

© Muttaqin, Chuang. This article is distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use and redistribution provided that the original author and source are credited.

Selection and Peer-review under the responsibility of the IICB Conference Committee.

 OPEN ACCESS

EMI can be a means to enhance students' future careers (Dearden, 2014; Wanphet & Tantawy, 2018). Socio-culturally, EMI policy has encouraged international co-operations and interactions in various fields of education and has also helped the students to develop their intercultural awareness and learning abilities (Crystal, 2003). Therefore, more universities worldwide have turned their policy into EMI with different degrees of implementation specific to their contexts (Macaro et al., 2018).

Some benefits have been observed from taking EMI in different learning contexts. In Europe, Coleman (2006) found that using English in teaching contents has improved subject knowledge and English language proficiency among students in Austria. In addition, EMI students in Taiwan reported experiencing improvement in their English proficiency (Wu, 2006; Chang, 2010), while those in the United Arab Emirates (UAE) reported some improvements in their reading skills and vocabulary (Wanphet & Tantawy, 2018). Further, Haagen-Schützenhöfer and Mathelitsch (2001) found that the students instructed with EMI showed an enhanced flexibility in foreign-language communication and were able to talk about a large variety of subject-specific topics. In addition, EMI instruction often increases students' motivation and clarifies the confusion between everyday and scientific concepts. However, due to the complexity of EMI in its implementation (Dafouz & Smit, 2020) and the status of English as a second or foreign language in EMI implementation, considerable challenges have been observed, such as dealing with the lecturers and students' language proficiency (Aizawa & Rose, 2019; Floris, 2014; Mirizon, Wadham, & Curtis, 2019), limited institutional supports (Airey, 2017; Byun et al., 2011; Nguyen, Walkinshaw, I., & Pham, 2017), deficient teaching and learning strategies in EMI classes (Evans & Morrison, 2011), and different perceptions of the lecturers and the students (Jiang, Zhang, & May, 2019; Joe & Lee, 2012; Kuteeva, 2020).

More strategic support is thus required to help the students follow EMI courses better, one of which is by providing English skills development through offering English for specific purposes (ESP) courses before or during taking their EMI courses. ESP is believed to provide more contextual language learning that is integrated and is able to utilize subject contents as the core materials of learning (Basturkmen, 2010). It also emphasizes the pragmatic use of English (Harvey, 2013), authentic learning (Danaye & Haghghi, 2014), and specialized-learning rather than generalized ones (Malcolm, 2013). Specifically related to EMI, ESP can be more directed for specific pedagogical purposes to eventually develop students' disciplinary knowledge through building their disciplinary terms, patterns of interaction language and certain genres (Basturkmen, 2010).

In addition, ESP can help the students improve their English proficiency as they are taught some skills in academic learning, communication skills, and intercultural awareness by integrating reading, speaking and writing (Costa & Mastelloto, 2022). Especially as some universities in Indonesia often require their students to achieve a minimum exit threshold for completing their bachelor's or master's degree, an English proficiency score can be a powerful trigger for the students to improve their English. Moreover, in EMI contexts English proficiency has been a vital and crucial condition that needs to be considered by both lecturers and policy makers so that their EMI courses can run well, one of which is with the support of effective ESP teaching. As in a higher education EMI setting students' English proficiency is a determining factor for the students' academic achievement (Muttaqin, Chuang, Lin, & Cheng, 2022), ESP therefore is expected to support EMI students to prepare them with necessary academic English skills to follow their EMI courses.

Some studies have shown how ESP has contributed to students' better English learning conditions and outputs. Compared to teaching general English, ESP teaching has provided the students with more advanced linguistic inputs and was much faster in English language processing (Kasper, 1997). Students' motivation was found to be increasing when learning ESP as they learn practical English with more involvement in task-based learning and disciplinary knowledge development (Banegas, 2018; Chen, 2005; Dudley-Evans & St John, 1998; Basturkmen, 2010). Further, Song (2006) found that ESP students achieved high scores in their ESL and achieved better long-term academic success as they were more involved in content-based learning. Therefore, it is of paramount importance that ESP courses be designed in such a way that is relevant to the EMI students' need either academically or professionally so that the students will be more motivated to take the ESP class (Arnó-Macià, Aguilar-Pérez, & Tatzl, 2020).

In supporting EMI teaching, ESP was found to enhance students' motivations to develop their English as ESP teaching is in line with the disciplinary content learning tasks and needs required in EMI learning as they were more assisted in developing their linguistic capacity and disciplinary knowledge especially in oral and written skills (Basturkmen, 2010). By taking an ESP course, EMI students were more prepared to take their courses delivered in English, though not as their native language and demanding in English language and learning skills, especially in dealing with writing assignments (Costa & Mastelloto, 2022). Furthermore, Rose, Curle, Aizawa, and Thompson (2020) found out that students' academic English skills obtained from following an ESP course, were predictive to their academic achievement. In addition to having improved academic skills, EMI students were more successful in their professional careers with the

support from the skills acquired through following ESP courses (Arnó-Macià et al., 2020). Therefore, a lot of EMI lecturers recommended that EMI students take ESP courses prior to taking EMI for them to have better preparation in following their EMI courses (Arnó-Macià et al., 2020).

In the Indonesian higher education institutions (HEIs) context, EMI has been gaining more attention as an effort to enhance their internationalization vision and at the same time an effort of the government to improve the quality of higher education in Indonesia (Dewi, 2017; Kemristekdikti, 2018; Lamb et al., 2021; Simbolon, 2018). This is further strengthened by the Ministry of Research, Technology, and Higher Education (MoRTHE, former name of MoEC) target in achieving at least four universities to be in the Top 500 World University Ranking (WUR) by 2018 (Kemristekdikti, 2018). The MoRTHE even projected that a compulsory bilingual curriculum would be enacted in all universities in Indonesia in 2016 to boost the quality of tertiary education through improved students' English (Dewi, 2017). In some universities in Indonesia, EMI has been implemented in a special program called International Class in which full EMI is applied. Some, however, still implement EMI in certain courses designed as voluntary programs by lecturers, which is often called as partial EMI, along with the regular Indonesian-medium instruction (IMI).

Previous studies looking at EMI practices in Indonesian HEIs have been conducted to reveal perceptions of the lecturers, the students, and the policy makers that EMI was beneficial for their students' academic and professional careers in addition to strengthening HEI internationalization vision (Floris, 2014; Dewi, 2017). In addition, the EMI teachers were more motivated to teach their EMI courses as they were challenged to have in-depth knowledge about their field of study, to apply different teaching approaches, to provide some enrichment for content mastery of the students, to apply more student-centered approach than teacher-centered in class, and to use more various teaching media to facilitate students learn better in EMI class (Mirizon et al., 2019). Some challenges, however, were noted regarding students' and lecturers' lack of linguistic competence that hindered classroom interaction for disciplinary knowledge understanding (Floris, 2014). Simbolon (2018) further revealed how EMI teachers still struggled to fully use English in EMI class, thus preferring to apply translation and code switching due to their lack of English familiarity to explain concepts in English. However, lack of studies have been conducted in Indonesian higher education institutions to see the academic and linguistic supports to help the students follow their EMI courses better. This study therefore is worth taking as it examined how the ESP course, as a form of learning and language support, was associated with the development of

their English proficiency and overall academic achievement of the EMI students at an Indonesian university. Theoretically, this study would contribute to the provision of wider perspectives in the role of ESP courses in EMI implementation. Practically, EMI policy makers would get more empirical evidence on the important role of ESP towards assuring the students well prepared to cope with the linguistic challenges in their EMI courses. This study therefore was conducted to address the following questions:

1. Is there any relationship among ESP, English proficiency, and academic achievement of the EMI students at a university in Indonesia.
2. Is there any mediating effect of English proficiency on the relationship between ESP and academic achievement at a university in Indonesia?

Based on the research questions above, the hypotheses were formulated as follows:

Hypothesis 1: ESP is positively associated with academic achievement of the EMI students.

Hypothesis 2: ESP is positively associated with English proficiency of the EMI students.

Hypothesis 3: English proficiency when combined with ESP significantly predicts EMI students' academic achievement.

Hypothesis 4: There is a mediating effect of English proficiency in the association between ESP and academic achievement of the EMI students.

The stated hypotheses are thus modeled in Figure 1.

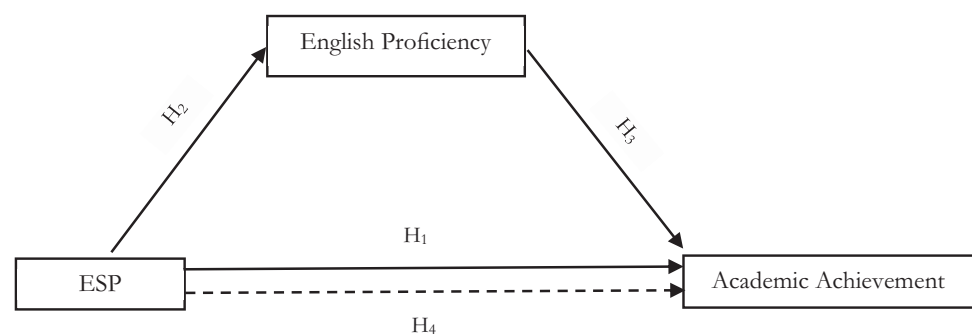


Figure 1: Research Model.

2. METHOD

2.1. Data Source and Collection

This current study aimed to examine the relationship between the ESP score, English proficiency, and academic achievement and to investigate the mediating effect of English proficiency on the relationship between ESP and academic achievement of the EMI students. The data were in the form of empirical data comprising ESP score, English proficiency (TOEFL) scores, and cumulative GPA of the EMI students at a university in Indonesia. After a formal letter requesting permission to conduct the study was sent to the university academic office, an approval was granted by the university. The data consisted of 246 students from different years of enrollment (2008–2016) who already completed their undergraduate degree (Table 1). Participants’ confidentiality was assured by removing students’ personal information. Meanwhile, reliability was obtained by checking for accuracy, completeness, and consistency of the resulting complete data without any missing data of 246 participants by using the listwise technique in SPSS 24 software.

TABLE 1: Summary of the Participants.

Variables	N	%	M	SD
Study Program				
Communication Science	121	49.2		
International Relations	125	50.8		
Intake Years				
2010	75	30.5		
2011	42	17.1		
2012	78	31.7		
2013	32	13.0		
2014	19	7.7		
Gender				
Female	142	57.7		
Male	104	42.3		
TOEFL Score			489.50	59.512
ESP Score			3.43	.520
GPA			3.35	.214
Gender				
Female	142	57.7		
Male	104	42.3		
Total	246	100		

2.2. Measurement and Analyses

English for specific purposes was measured by the EMI students' final score after completing the course and then converted into the scores ranging from 1 – 4 based on the academic handbook of the university. Their English proficiency was measured using the TOEFL score (310–677), as a common measure for English proficiency for non-English speaking students (Graham, 1987; Johnson, 1988), which was taken at the end of their study as the requirement for their graduation. Their academic achievement was measured using the overall GPA of the students ranging from 2.00 – 4.00, as suggested by Fan and Chen (1999) and Oliver, Vaderford, and Grote (2012), which were the passing grades for undergraduate degrees at the Indonesian higher education system.

Before the statistical analyses were conducted, the obtained data were screened in order to check the normality using Kolmogorov–Smirnov and Shapiro–Wilk which was also required to conduct the mediation analysis. Then, to ensure the reliability of the analysis results, as mediation analysis applies regression analysis, assumptions proposed by Osbourne and Waters (2002) were met, namely normal distribution shown by the scatterplot, linearity shown by P-P Plots showing points falling in the line (Figure 2), no multicollinearity using the variance inflation factor (<10), and homoscedasticity (Cook's distance of min. .000, max .048). No multicollinearity was present, as shown by there being no strong correlations between the predictor variables ($<.9$). The model fit and analysis of variance were also checked as both were significant ($p <.001$), showing a good model fit acceptable for further analysis.

Regression analyses were conducted using Process 3.5 by Hayes in SPSS 24 to examine the correlations among ESP score, English proficiency score, and overall GPA, as well as the mediation analysis followed by bootstrapping to test whether the mediation effects were significant. Mediation assumptions by Baron and Kenny (1986) were applied, which include path a in which the independent variable (IV) has a causal relationship with the dependent variable (DV), path b in which the IV has a causal relationship with the mediator (M) variable, path c in which the M significantly affects DV, and path c' in which the M variable significantly mediates the IV–DV relationship, with the effect of IV on DV controlling for M should be zero. To test a significant mediation, the Sobel test was used to provide “an approximate significance test for the indirect effect of the independent variable on the dependent variable via the mediator” (Baron & Kenny 1986). Finally, to check whether the mediation was complete or partial, Preacher and Hayes's (2004) assumptions were applied.

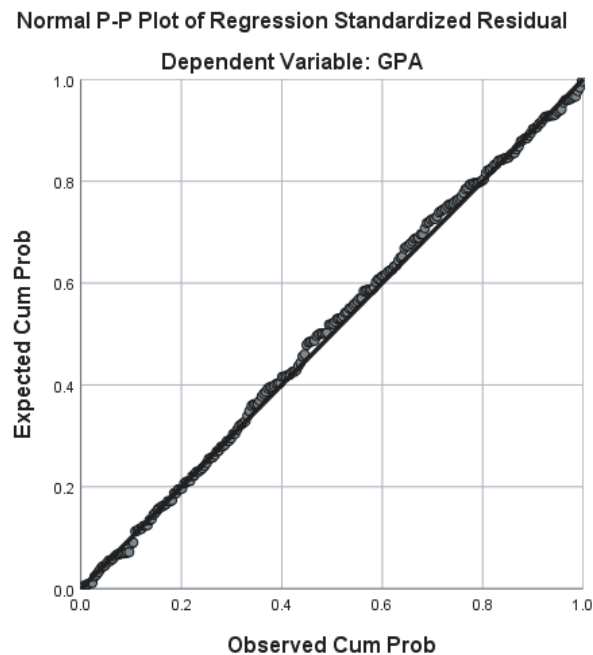


Figure 2: Normal P-P Plot of the Regression Standardized Residual.

3. FINDINGS AND DISCUSSION

3.1. Findings

3.1.1. Correlation Among SES, English Proficiency, and Academic Achievement

The first aim of the study was to examine the relationship among ESP, English proficiency, and academic achievement of the EMI students at a university in Indonesia. From Table 2 on the results of the Pearson correlation analysis, significant relationships were found among the variables. A significant positive correlation ($r = .335$, $p < .001$) was found between students' ESP score and their GPA, which indicates an increase in the GPA as their ESP score increased. Hypothesis 1 of this study, therefore, was supported. Then, a significant positive correlation between ESP score and English proficiency ($r = .401$, $p < .001$), meaning that as their ESC score increased their TOEFL score increased as well. Hypothesis 2 of this study was also supported. Finally, there was a significant positive correlation between the TOEFL score and the GPA ($r = .342^*$, $p < .001$), which means that the higher the students' English proficiency, the higher their GPA. So, Hypothesis 3 of this study was also supported. As the findings were in accordance with the mediation assumptions by Baron and Kenny's (1986) principles, a mediation analysis could then be conducted.

TABLE 2: Correlation Coefficients.

		ESP	TOEFL	GPA
Pearson Correlation	ESP	1.000	.401***	.335***
	TOEFL		1.000	.342***
	GPA			1.000

*** Correlation is significant at the 0.001 level (2-tailed)

3.1.2. Mediating Effects of English Proficiency

Further, a mediation analysis was carried out using Process 3.5 by Hayes (2017) in SPSS 24 by testing the IV (ESP score), the M (TOEFL score), and the DV (GPA). The model summary shows a good fit ($r = .401, p < .001$). Meeting the first assumption (path c), it was found that ESP score significantly predicted GPA ($b = .0971, p < .001$). This means that for every 1 increase in ESP score, students' GPA increased by about 0.0971. Meeting the second assumption (path a), ESP score was found to predict the TOEFL score ($b = 45.8186, p < .001$). This means that for every 1 increase in ESP score, the TOEFL score increased by about 45.82. Finally, after testing the third assumption (path b) and fourth assumption (path c') by examining the regression analyses of the relationship between ESP score and GPA as well as the TOEFL score and GPA, it was shown that in path b , GPA was significantly predicted by the TOEFL score ($b = .0009, p < .001$). This shows that for every 1-point increase in the TOEFL score, GPA increased by about .0009. Further, the mediation analyses showed that after combining family income and the TOEFL score to predict GPA, ESP score still significantly predicted GPA ($b = .1379, p < .001$). The final mediation model, as presented in Figure 2, shows that English proficiency partially mediated the relationship between ESP score and academic achievement. The bootstrap confidence interval with 5,000 samples confirmed the significant mediation effect by the indirect effect of family income on GPA through the TOEFL score (Table 4) with no 0 in the interval between the lower level 95% confidence interval (CI) and upper level 95% CI.

Finally, regarding the mediation analysis, English proficiency was shown to mediate the relationship between ESP score and GPA. Based on the analysis it was found that the TOEFL score was the partial mediator of the relationship, which means that both ESP score and TOEFL score both when together could predict the EMI students' GPA. Hypothesis 4 of this study was thus supported. The mediation finding can be shown in the following graph. The mediation result is presented in the following Figure 2.

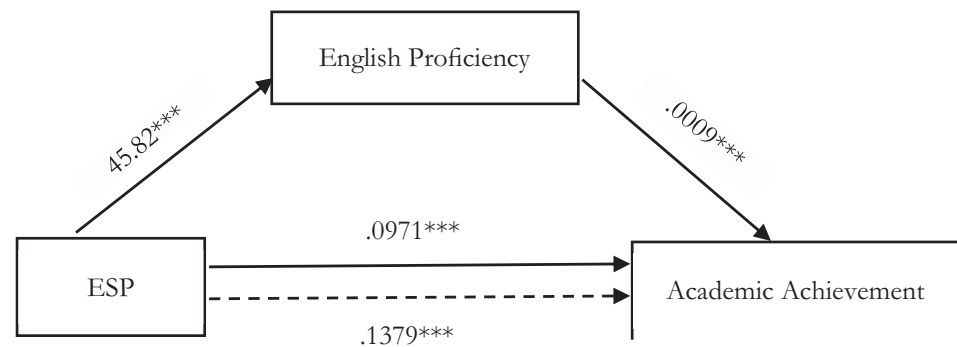


Figure 3: The Mediation Results.

3.2. Discussion

The current study has revealed the relationships among three variables, namely students' English for specific purposes (ESP), English proficiency, and academic achievement of the EMI students at a university in Indonesia. From the findings, both ESP score and English proficiency score were significantly related to the academic achievement measured by the EMI students' overall GPA. This is similar to Song's (2006) finding that indicated how important both ESP and English proficiency were to help EMI students succeed in their courses. This could be explained due to the nature of ESP course that is aimed to provide the specific field students some necessary English language skills that are directed to assist them in specific academic skills (Basturkmen, 2010; Malcolm, 2013), such as reading, through building strategies like skimming and scanning, writing, through paragraph or essay writing in such an organized way with coherence and unity components. This was also further confirmed by the course syllabus at the faculty under study that the aim of the course was to equip the students with reading comprehension strategies and listening skills and an emphasis on achieving a required TOEFL score.

In addition, the university language policy stipulated in the academic handbook requiring an exit level of English proficiency of at least TOEFL score of 450 for the undergraduate also could strengthen the ESP position and also enhance students' motivation to take ESP in order to be able to graduate. Though optional, some overseas programs like summer programs, exchange programs to overseas universities, also can be a factor that put ESP as an important precondition in following their EMI program. Thus, the requirement for their EMI programs, which are minimum exit proficiency level and overseas study opportunities could motivate the students to take the ESP course, as found by (Banegas, 2018; Chen, 2005; Dudley-Evans & St John, 1998)

Further, English proficiency was also related to EMI students' achievement as found in previous EMI studies (Muttaqin et al., 2022; Rose et al., 2020). The context of EMI that

places English as the language to deliver lectures and to construct disciplinary knowledge through interactions between the lecturers or the students undeniably implies that as the students' TOEFL score increases, their EMI achievement also increases. It is due to the fact that adequate English is needed by the EMI students to understand instructions from the lecturers, to read references that are in English, and to express their understanding either orally or in written form. Lack of proficiency in students' English will affect EMI teaching and learning and will hinder students' development of their disciplinary knowledge in which they are involved in specific discourse interaction and construction (Dafouz & Smit, 2020). Furthermore, to reveal the complexity of EMI as stated by (Baker, 2001; Dafouz & Smit, 2020) the mediation analysis finding showed that English proficiency played a partial mediator in the association between ESP score and academic achievement of the EMI students. This implies that both ESP and English proficiency contribute significantly and hand in hand affect the academic achievement of the students. Each of the variables plays their significant roles towards disciplinary knowledge construction, as ESP course is designed to enhance the students' academic skills involving English (Rose et al., 2020) and to provide more motivations in using English to learn content courses (Banegas, 2018; Chen, 2005; Dudley-Evans & St John, 1998; Basturkmen 2010), while English proficiency determines the degree of the students' interaction and participation in the EMI courses. It is therefore necessary to provide the EMI students with the English language skills and academic learning skills since both are prerequisites for the students' success in an EMI learning.

EMI policy makers thus have to assure that the ESP courses are designed to support the EMI program rather than merely teaching general skills, such as for achieving certain TOEFL score requirements. ESP should be more practical and more long-term oriented to fulfill pedagogical needs of the EMI students as they will be exposed to learning their courses in English and at the same time prepare them either to pursue their higher education or to get a prestigious job which often requires certain level of English proficiency either in the selection process or even after being accepted. This, therefore, needs to be conducted by collaboration with the English specialists from the university language center or the English department as they are the experts to design the ESP model or curriculum that fits both academic and professional needs of the EMI students; meanwhile, the content lecturers as the experts in the content areas can propose some skills required for the disciplinary knowledge development of the students and provide resources that can be utilized for reading, speaking, or writing activities.

4. CONCLUSION AND RECOMMENDATION

This current study has revealed the relationships among ESP score, English proficiency, and GPA and also the mediating effect of English proficiency on the relationship between ESP score and GPA of the EMI students. ESP score and English proficiency are both significantly related to academic achievement of the EMI students. EMI students' academic achievement is thus related to how they perform in their ESP course as it is supposed to equip the students with academic English and learning skills to support their EMI learning. At the same time, the students' English proficiency will be also enhanced by learned skills and their intensity of interactions using English in disciplinary knowledge construction. Due to its features geared toward academic English and learning skill development specific to their field, ESP courses thus can be regarded as "the pillar" for sustaining EMI learning. In addition, the partial mediating effect of English proficiency on the ESP score and GPA relationship can strengthen the position of ESP courses in higher education institutions especially in the EMI program to gain the dual benefits of EMI, namely mastery in disciplinary knowledge and English language. Looking at the crucial position of ESP and English proficiency for helping the EMI students to complete their EMI learning journey, more collaborations are suggested between content lecturers and English specialists to design better ESP teaching that fits the academic and professional needs of the EMI students during and after their study. In addition, EMI policy makers are expected to assure a supportive English learning environment, either by providing more access to references, such as English textbooks, journals, magazines in English that are specific to their fields and can support the EMI teaching and learning. In addition, providing more real exposure to English by international guest lecturers and international student exchange programs will also motivate them to develop both their English and their disciplinary knowledge as they will be required to use English in more real uses by following such activities. In order to provide more comprehensive and robust findings, as this study only used quantitative data to address the research questions, more qualitative data from the ESP lecturers and students through interview, questionnaire, or classroom observation will enrich the findings and provide a rigorous explanation for the importance of ESP to sustain EMI programs at higher education institutions.

References

- [1] Airey J, Lauridsen KM, Räsänen A, Salö L, Schwach V. The expansion of English-medium instruction in the Nordic countries: can top-down university language policies encourage bottom-up disciplinary literacy goals? *High Educ.* 2017;73(4):561–76.
- [2] Aizawa I, Rose H. An analysis of Japan's English as medium of instruction initiatives within higher education: the gap between meso-level and micro-level practice. *High Educ.* 2019;77(6):1125–42.
- [3] Arnó-Macià E, Aguilar-Pérez M, Tatzl D. Engineering students' perceptions of the role of ESP courses in internationalized universities. *Engl Specif Purposes.* 2020;58(1):58–74.
- [4] Baker C. *Foundations of bilingual education and bilingualism.* Clevedon: Multilingual Matters; 2001.
- [5] Banegas DL. Learning subject-specific content through ESP in a geography teaching program: an action research story in Argentina. *Engl Specif Purposes.* 2018;50(1):1–13.
- [6] Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J Pers Soc Psychol.* 1986 Dec;51(6):1173–82.
- [7] Bastürkmen H. *Developing courses in English for specific purposes.* London: Palgrave Macmillan; 2010. <https://doi.org/10.1057/9780230290518>.
- [8] Byun K, Chu H, Kim M, Park I, Kim S, Jung J. English-medium teaching in Korean higher education: policy debates and reality. *High Educ.* 2011;62(4):431–49.
- [9] Chang YY. English-medium instruction for subject courses in tertiary education: reactions from Taiwanese undergraduate students. *Taiwan International ESP Journal.* 2010;2(1):53–82.
- [10] Chen PC. Effectively implementing a collaborative task-based syllabus (CTBA) in EFL large-sized business English classes. *English for Specific Purposes World.* ESP-world. 2005;4(10). Available from http://esp-world.info/Articles_10/issue_10.htm
- [11] Coleman JA. English-medium teaching in European higher education. *Lang Teach.* 2006;39(1):1–14.
- [12] Costa F, Mastellotto L. The role of English for Specific Purposes (ESP) in supporting the linguistic dimension in English-medium Instruction (EMI). *CLIL Journal of Innovation and Research in Plurilingual and Pluricultural Education.* 2022;5(2):37–52.

- [13] Crystal D. English as a global language. 2nd ed. Cambridge: Cambridge University Press; 2003. <https://doi.org/10.1017/CBO9780511486999>.
- [14] Danaye TM, Haghighi S. Evaluation of ESP textbooks: evidence from ESP textbook of computer engineering major. *International Journal of Research Studies in Language Learning*. 2014;3(2):55–68.
- [15] Dafouz E, Smit U. Road-mapping English Medium Instruction in the internationalised university. London: Palgrave Macmillan; 2020. <https://doi.org/10.1007/978-3-030-23463-8>.
- [16] Dearden J. English as a medium of instruction-a growing global phenomena. Available from <https://www.teachingenglish.org.uk/article/english-a-medium-instruction—a-growing-global-phenomenon>
- [17] Dewi A. English as a medium of instruction in Indonesian higher education: A study of lecturers' perspectives. In: Fenton-Smith B, Humphreys P, Wilkinshaw I, editors. *English medium instruction in higher education in Asia Pacific: From policy to pedagogy*. Cham: Springer; 2017. pp. 241–58.
- [18] Doiz A, Lasagabaster D, Sierra JM. Internationalisation, multilingualism and English-medium instruction. *World Engl*. 2011;30(3):345–59.
- [19] Dudley-Evans T, St John MJ. *Developments in ESP: A multi-disciplinary approach*. Cambridge: Cambridge University Press; 1998.
- [20] Evans S, Morrison B. Meeting the challenges of English-medium higher education: the first-year experience in Hong Kong. *Engl Specif Purposes*. 2011;30(3):198–208.
- [21] Fan X, Chen M. Parental involvement and students' achievement: A meta-analysis. *Proceedings of the 1999 Annual Conference of American Association of Educational Researcher*. 1999. Available from <https://files.eric.ed.gov/fulltext/ED430048.pdf>
- [22] Floris FD. Learning subject matter through English as the medium of instruction: Students' and teachers' perspectives. *Asian Engl*. 2014;16(1):1–13.
- [23] Graham JG. English language proficiency and the prediction of academic success. *TESOL Q*. 1987;21(3):505–21.
- [24] Haagen-Schützenhöfer C, Mathelitsch L. English as a medium of instruction in science-teaching. Michelini M, Cobal M (Eds.), *Developing Formal Thinking in Physics*; 2001. pp. 293–296. Lithostampa: Forum, Editrice Universitaria Udinese srl.
- [25] Harvey L. EAP teachers' perceptions of learner motivation. *International Student Experience Journal*. 2013;2(1):14–9.
- [26] Hayes AF. *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guildford Press; 2017.

- [27] Jiang L, Zhang LJ, May S. Implementing English-medium instruction (EMI) in China: Teachers' practices and perceptions, and students' learning motivation and needs. *Int J Biling Educ Biling*. 2019;22(2):107–19.
- [28] Joe Y, Lee HK. Does English-medium instruction benefit students in EFL contexts? A case study of Medical students in Korea. *Asia-Pac Educ Res*. 2013;22(2):201–7.
- [29] Johnson P. English language proficiency and academic performance of undergraduate international students. *TESOL Q*. 1988;22(1):164–8.
- [30] Kasper LF. The impact of content-based instructional programs on the academic progress of ESI students. *Engl Specif Purposes*. 1997;16(4):309–20.
- [31] Kemristekdikti. Laporan kinerja 2018. Jakarta: Kemristekdikti; 2019 Available from https://lkdikti7.ristekdikti.go.id/_renstra/LAKIN_2018.pdf
- [32] Kuteeva M. Revisiting the 'E' in EMI: students' perceptions of standard English, lingua franca and translanguaging practices. *Int J Biling Educ Biling*. 2020;23(3):1–14.
- [33] Lamb M, Kuchah H, Coleman H, Hadisantosa N, Waskita D, Ahmad NF. The state of English as Medium of Instruction (EMI) in Higher Education Institutions in Indonesia. Retrieved from https://www.britishcouncil.id/sites/default/files/the_state_of_english_as_medium_of_instruction_in_heis_in_indonesia_full_report_final.pdf
- [34] Macaro E, Curle S, Pun J, An J, Dearden J. A systematic review of English medium instruction in higher education. *Lang Teach*. 2018;51(1):36–76.
- [35] Malcolm D. Gulf Arab students studying medicine in English. In: Ushioda E, editor. *International perspectives on motivation: Language learning and professional challenges*. London: Palgrave Macmillan; 2013. pp. 98–116.
- [36] Mirizon S, Wadham B, Curtis D. Integrated content and language instruction: Lecturers' views and classroom instructional practices. *Aust J Teach Educ*. 2019;44(3):42–160.
- [37] Muttaqin S, Chuang HH, Lin CH, Cheng MM. When proficiency and education matter: the mediating role of English proficiency and moderating effect of parents' education in the SES–Academic achievement relationship during EMI. *SAGE Open*. 2022;12(2):1–13.
- [38] Nguyen HT, Walkinshaw I, Pham HH. EMI programs in a Vietnamese university: Language, pedagogy and policy Issues. In: Fenton-Smith B, Humphreys P, Walkinshaw I, editors. *English medium instruction in higher education in Asia-Pacific: From policy to pedagogy*. Cham: Springer International Publishing; 2017. pp. 37–52.

- [39] Oliver R, Vaderford S, Grote E. Evidence of English language proficiency and academic achievement of non-English-speaking background students. *High Educ Res Dev*. 2012;31(4):541–55.
- [40] Osbourne JW, Waters E. (2002). Four assumptions of multiple regression that researchers should always test. *Practical Assessment, Research and Evaluation*. 2022;8(2). <https://doi.org/10.7275/r222-hv23>.
- [41] Preacher KJ, Hayes AF. SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behav Res Methods Instrum Comput*. 2004 Nov;36(4):717–31.
- [42] Rose H, Curle S, Aizawa I, Thompson G. What drives success in English medium taught courses? The interplay between language proficiency, academic skills, and motivation. *Stud High Educ*. 2020;45(11):2149–61.
- [43] Simbolon NE. EMI in Indonesian higher education: Stakeholders' perspectives. *TEFLIN*. 2018;29(1):108–28.
- [44] Song B. Content-based ESI instruction: long-term effects and outcomes. *Engl Specif Purposes*. 2006;25(4):420–37.
- [45] Wanphet P, Tantawy N. Effectiveness of the policy of English as a medium of instruction: perspectives and outcomes from the instructors and students of university science courses at a university in the UAE. *Educ Res Policy Pract*. 2018;17(2):145–72.
- [46] Wu SW. Students' attitude toward EMI: Using Chung Hua University as an example. *Journal of Education and Foreign Language and Literature*. 2006;4:67–84.