11th International Conference on Higher Education Advances (HEAd'25)
Universitat Politècnica de València, València, 2025
DOI: https://doi.org/10.4995/HEAd25.2025.20095

Coping with the challenge from English-medium instruction (EMI): What learning strategies matter and how?

Cecilia Ka Wai Chun[1], Kwok Wing Sum[1], Cathy Wing Hoi Shiu[2]
[1]Centre for Learning Enhancement And Research, The Chinese University of Hong Kong, Hong Kong,
[2]Department of Curriculum and Instruction, The Chinese University of Hong Kong, Hong Kong.

How to cite: Chun, C. K. W.; Sum, K. W.; Shiu, C. W. H. (2025). Coping with the Challenge from English-Medium Instruction (EMI): What Learning Strategies Matter and How? In: 11th International Conference on Higher Education Advances (HEAd'25). Valencia, 17-20 June 2025. https://doi.org/10.4995/HEAd25.2025.20095

Abstract

English-medium instruction (EMI) has witnessed an exponential growth in university education worldwide, especially in East Asian countries and regions in the past two decades. Previous studies have shown that students' learning of academic content might be adversely affected due to limited English proficiency. To overcome the challenges from EMI, students' first language is regarded as one of the resources to facilitate learning. Artificial intelligence (AI) technology is another tool which is increasingly popular yet controversial in teaching and learning. Based on the findings of a survey study conducted in a university in Hong Kong, this paper provides evidence on the effectiveness of the use of students' first language and AI tools in helping students cope with EMI in the university. It sheds light on how universities may respond to students' use of first language and AI in learning through English.

Keywords: *English-medium instruction (EMI); learning strategy; first language; artificial intelligence.*

1. Introduction

Over the past twenty years, there has been an increasing trend of using English as a medium of instruction (MOI) in the higher education sector in many non-Anglophone countries and regions, which is considered both an impetus and an outcome of internationalization (Curle *et al*., 2020). As defined by Macaro *et al*. (2018), EMI is "the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English". On the one hand, EMI is claimed to improve institutional ranking and foster the development of students' English competencies and employability. On the other hand, past studies have shown that learning through EMI may be challenging for students with limited English proficiency. For instance, Shepard and Rose

(2023) found that EMI posed academic challenges to Chinese-speaking students who constituted the majority of student population in Hong Kong.

To overcome the challenges from EMI, university students deploy different resources and learning strategies. For instance, Soruç and Griffiths (2018) identified 36 strategies used by students in a Turkish university for coping with EMI. Most of them were cognitive strategies such as asking questions, using prior experience and looking for main ideas. Another study by Yu *et al.* (2021) classified the learning strategies used by Mainland Chinese students in a Macau university into four categories, which were first language (L1)-mediated strategy, second language (L2)-related strategy, tool-mediated strategy, and community-mediated strategy. Among them, L1-mediated strategy was found to be a major learning strategy that students used in comprehending course materials. Examples were reading Chinese translations of the original textbooks and translating course PowerPoint slides from English into Chinese. Students also made use of resources from the Internet to facilitate their learning through EMI. Given the rapid technological advancement nowadays, it can be expected that students may rely on online tools and resources more than ever to overcome learning challenges in general and EMI in particular.

According to a review study by Curle *et al.* (2020), the use of first language in EMI settings is generally viewed by content lecturers and students as a useful resource for comprehension of academic content, though translanguaging is often viewed as undesirable in an EMI classroom because it might exclude and disadvantage international students. Despite this generally positive view, it is not conclusive in past literature regarding the effectiveness of first language usage in improving student learning outcomes. On the other hand, with the emergence of tools such as Grammarly and ChatGPT, AI has become one of the most popular yet controversial buzzwords in higher education in the last decade. Students and teachers have mixed perceptions towards the use of AI in EMI settings given its potential benefits and drawbacks (Kikuchi, 2024). More importantly, there is an apparent lack of empirical evidence on the effectiveness of AI usage in higher education, especially in EMI settings.

To address the aforementioned knowledge gap, this study aims to examine the effects of first language usage and AI usage on how university students cope with EMI. It was conducted in a university in Hong Kong, where about two-thirds of lectures and about 80% of tutorials of undergraduate courses are conducted in either English or both English and Cantonese. Three research questions are addressed: Does the challenge from EMI affect student learning outcome in university (**RQ1**)? Does students' use of their first language in coping with EMI affect their learning outcome in university (**RQ2**)? Does students' use of AI tools in coping with EMI affect their learning outcome in university (**RQ3**)?

2. Method

Data were collected from 1158 undergraduate students in a university in Hong Kong by online survey using Qualtrics from May to June 2024. The variables analyzed in this paper include students' English Language results in the university entrance exam, that is, the Hong Kong Diploma of Secondary Education Examination (HKDSE); their cumulative grade point average (CGPA); and their use of first language and AI tools in coping with the challenges from EMI.

Students' English Language results in HKDSE is measured in seven levels, with Level 1 being the lowest and Level 5** the highest. These results are converted into grade points of 1 to 7 respectively in the analysis. Students' learning outcome in the university is measured by CGPA on a 4-point scale, which is the average of all GPAs that students have earned until they take the survey. The challenge from EMI is gauged by a question which asks, "Overall speaking, the medium of instruction in the university has made my study more challenging". It is measured by a 5-point scale which ranges from 'strongly disagree' (1) to 'strongly agree' (5). Finally, students were asked whether they had used different strategies to cope with the challenges from EMI in the university. Among them, the two learning strategies analyzed in this paper are reading textbooks and course materials published in students' first language; and checking grammar mistakes in writing by using AI tools, e.g., Grammarly. Students' responses were converted into dichotomous scores, i.e., 1 (yes) or 0 (no).

3. Results and Discussion

3.1. Descriptive Analysis

Results show that the sample has slightly more females (52.2%) than males. It comprises more students in Year 1 (29.6%) than students in Year 2 (25.9%), Year 3 (21.3%), and Year 4 or above (23.1%). Most of the sample students are local students (85.9%), and the remaining are either Mainland Chinese students (8.7%) or international and exchange students (5.4%). Cantonese is the first language spoken by the most sample students (79.9%), which is followed by Putonghua or Mandarin (11.3%), other Chinese dialects (3.2%) and English (2.6%).

For HKDSE results, a vast majority of sample students have attained Level 3 or above in the English Language exam (97.9%), which is the minimum university entrance requirement. The mean HKDSE English Language grade point is 4.36 which is above average on the 7-point scale. The mean of CGPA is 3.23 which corresponds to an average of B or better in course grade. The mean of the EMI challenge is 2.60 which is below average on the 5-point scale, indicating that in general, students did not think the MOI in the university was particularly challenging to their learning. As for students' use of the two learning strategies, less than one-third of the sample students (29.2%) reported that they read textbooks or reading materials published in their first language. On the other hand, about two-third of the sample students

(63.3%) reported that they checked grammar mistakes in writing by using AI tools, which indicates its popularity among students in polishing writing.

3.2. Correlation and Kruskal-Wallis Test

Correlation analysis shows that the two achievement variables correlate significantly with each other and with the EMI challenge. Specifically, HKDSE English Language grade point correlates positively with CGPA (r = 0.29, p < 0.001). On the other hand, the EMI challenge correlates negatively with HKDSE English Language grade point (r = -0.21, p < 0.001) and CGPA (r = -0.14, p < 0.001).

Results from Kruskal-Wallis test show that students who read textbooks or reading materials published in their first language have a significantly lower HKDSE English Language grade point (4.15) than those who did not (4.45) (p < 0.01). Similarly, students who checked grammar mistakes in writing by using AI tools have a significantly lower HKDSE English Language grade point (4.26) than those who did not (4.55) (p < 0.01). These results imply that the less English-competent students are more likely to make use of their first language and AI tools in learning through EMI.

3.3. Structural Equation Modelling

To investigate whether and to what extent the EMI challenge and the two learning strategies impact on student performance, structural equation modelling (SEM) is used for analyzing the data. To begin with, a base model is constructed which comprises students' HKDSE English Language grade point and CGPA. Mediation models are then constructed by first incorporating the EMI challenge and then the two learning strategies into the base model.

3.3.1. Base Model (Model 1)

The base model is a linear regression model which predicts students' CGPA with their HKDSE English Language grade point. As shown in Figure 1, students' HKDSE English Language grade point has a significant positive effect on CGPA (R^2 = 0.09, F(1,779) = 72.87, b = 0.09, p < 0.001). This is consistent with the findings of previous meta-analyses that university entrance exam score is a significant predictor of college performance (Richardson *et al*., 2012; Westrick et al., 2015).

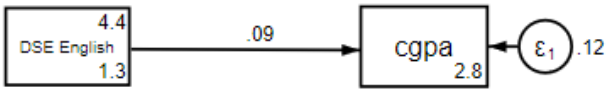

Figure 1. Model 1

3.3.2. Mediation Model (Model 2)

As shown in Figure 2, Model 2 is constructed by incorporating the EMI challenge into Model 1. Results show that students' HKDSE English Language grade point has a significant negative effect on the EMI challenge (b = -0.17, 95% CI [-0.227, -0.114]), and the EMI challenge has a significant negative effect on CGPA (b = -0.05, 95% CI [-0.074, -0.023]). The significance of the indirect effect is tested using bootstrapping procedures. The 95% confidence interval is computed for each of the 5000 bootstrap samples at the 2.5th and 97.5th percentiles. This results in a significant *positive* indirect effect on CGPA through EMI challenge (b = 0.01, 95% CI [0.003, 0.013]). In other words, students who were HKDSE high achievers perform better than HKDSE low achievers in the university partly because they perceive the university MOI as less challenging. On the other hand, students' HKDSE English Language grade point continues to have a significant positive direct effect on CGPA (b = 0.08, 95% CI [0.061, 0.103]). Overall, the results support a partial mediation model between HKDSE English Language grade point and CGPA through the EMI challenge.

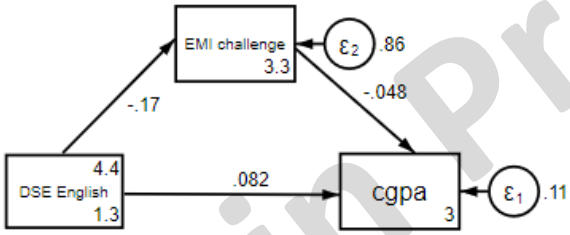

Figure 2. Model 2

3.3.3. Mediation Model (Models 3a and 3b)

Model 3a and 3b are constructed by incorporating the two learning strategies, i.e., the use of first language and AI tools respectively into Model 2. For Model 3a, results show that students with a higher HKDSE English Language grade point are less likely to use first language (relative-risk ratio (RR) = 0.79, 95% CI [0.690, 0.904]), but the use of first language has a significant positive effect on CGPA (b = 0.06, 95% CI [0.010, 0.113]) (Figure 3). By using the same bootstrapping procedures, a significant *negative* indirect effect is found on CGPA through the use of first language (b = -0.01, 95% CI [-0.033, -0.002]). On the other hand, students' HKDSE English Language grade point continues to have a significant positive direct effect (b = 0.08, 95% CI [0.063, 0.105]) on CGPA and a significant positive indirect effect through EMI challenge (b = 0.01, 95% CI [0.003, 0.014]). Hence, the results support a partial mediation model between HKDSE English Language grade point and CGPA through the EMI challenge and the use of first language.

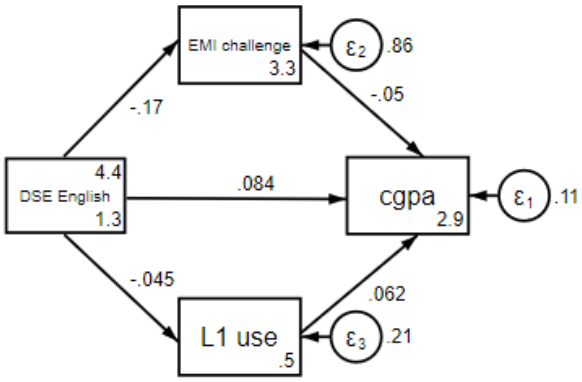

Figure 3. Model 3a

For Model 3b, results show that students with a higher HKDSE English Language grade point are less likely to use AI tools (relative-risk ratio (RR) = 0.80, 95% CI [0.711, 0.911]), but the use of AI tools has a significant positive effect on CGPA (*b* = 0.06, 95% CI [0.009, 0.108]) (Figure 4). By using the same bootstrapping procedures, a significant *negative* indirect effect is found on CGPA through the use of AI tools (*b* = -0.01, 95% CI [-0.028, -0.001]). On the other hand, students' HKDSE English Language grade point continues to have a significant positive direct effect (*b* = 0.09, 95% CI [0.064, 0.106]) on CGPA and a significant positive indirect effect through EMI challenge (*b* = 0.01, 95% CI [0.003, 0.014]). Hence, the results support a partial mediation model between HKDSE English Language grade point and CGPA through the EMI challenge and the use of AI tools.

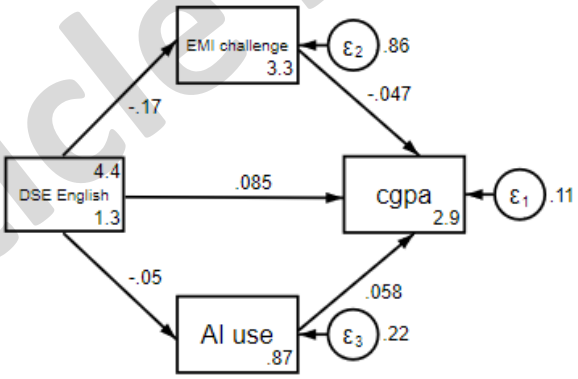

Figure 4. Model 3b

4. Conclusion

The present study provides empirical evidence on the relationships between students' prior achievement, university performance, EMI challenge and two learning strategies in coping with EMI, namely the use of students' first language and AI tools. On the one hand, it substantiates the role of prior achievement in student performance in the university, which has been well documented in past literature. On the other hand, it reveals how challenges from EMI may affect student learning in the university. In addition, the positive effect of the use of first language and AI tools on CGPA is paradoxical yet promising. While the low achievers in HKDSE are more likely to use first language and AI tools in coping with EMI, these two strategies are proved to play a supportive role in their learning. The positive effect of first language use is consistent with the findings of a review study by Chalmers (2019), which showed that systematic use of first language in teaching (e.g., translating key vocabulary into first language) could support student learning of content subjects and English. Chalmers (2019) therefore concluded by suggesting "a welcoming and inclusive attitude towards students' L1" and treating their L1 as "an asset rather than a liability". Regarding the use of AI in EMI settings, a finding in this study that warrants our attention is the high prevalence of use of AI writing tools among students, which reveals how student learning has been transformed by AI. Furthermore, the positive effect of AI usage on student performance as shown in this study may inform university policy and practice in the use of AI in teaching and learning. While the potential benefits of AI should not be neglected, university policymakers should set clear guidelines to delineate AI assistance and plagiarism in writing so that teachers and students can make optimal and effective use of AI. Given the fast-paced development of AI, it can be anticipated that the use of AI is unavoidable in university education. More concerted effort is needed to unveil the possibilities and complexities in using AI in higher education in future.

Acknowledgement

This research is supported by Teaching Development and Language Enhancement Grant funded by the University Grants Committee (2022-25).

References

Chalmers, H. (2019). *The role of the first language in English medium instruction*. Oxford University Press.

Curle, S., Jablonkai, R., Mittelmeier, J., Sahan, K., & Veitch, A. (2020). *English medium part 1: Literature review*. In N. Galloway (Ed.) *English in higher education* (Report No. 978-0-86355-977–8). British Council. https://www.teachingenglish.org.uk/article/english-higher-education-%E2%80%93-english-medium-part-1-literature-review

Kikuchi, H. (2024). Generative AI as a tool for enhancing English medium instruction. In Y. Choubsaz, P. Díez-Arcón, A. Gimeno-Sanz, J. Hriňák, X. Liashuk, S. Pokrivčáková & H. Vančová (Eds.), *CALL for Humanity - EUROCALL 2024 Short Papers.* https://doi.org/10.4995/EuroCALL2024.2024.19027

Macaro, E., Curle, S., Pun, J., An, J., & Dearden, J. (2018). A systematic review of English medium instruction in higher education. *Language Teaching*, *51*(1), 36–76. doi:10.1017/S0261444817000350

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin, 138*(2), 353–387. https://doi.org/10.1037/a0026838

Shepard, C., & Rose, H. (2023). English medium higher education in Hong Kong: Linguistic challenges of local and non-local students. *Language and Education, 37*(6), 788–805. https://doi.org/10.1080/09500782.2023.2240571

Soruc, A., & Griffiths, C. (2018). English as a medium of instruction: students' strategies. *ELT Journal*, *72*(1), 38-48. https://doi.org/10.1093/elt/ccx017

Westrick, P. A., Le, H., Robbins, S. B., Radunzel, J. M. R., & Schmidt, F. L. (2015). College performance and retention: A meta-analysis of the predictive validities of ACT® scores, high school grades, and SES. *Educational Assessment*, *20*(1), 23–45. https://doi.org/10.1080/10627197.2015.997614

Yu, S., Wang, Y., Jiang, L., & Wang, B. (2021). Coping with EMI (English as a medium of instruction): Mainland China students' strategies at a university in Macau. *Innovations in Education and Teaching International*, *58*(4), 462–472. https://doi.org/10.1080/14703297.2020.1784248