

Technological University Students' Efforts in English-Medium Instruction (EMI) Classes

Chen-Lin Lo

Lecturer, Foreign Language Education Center, National Kaohsiung University of Science and Technology

PhD Student, Department of Education, National Taitung University

Chen-Li Huang (Corresponding Author)

Professor, Department of Education, National Taitung University

1. Introduction

In the wake of globalization and the increasing need for cross-cultural competencies, the National Development Council and the Ministry of Education in Taiwan (2023) have articulated a bold bilingual policy aimed at enhancing young professionals' English proficiency and international competitiveness. At the forefront of this educational revolution, the Ministry of Education (2022) has championed the implementation of English-Medium Instruction (EMI) within higher education institutions. This initiative is designed to augment students' English language capabilities, broaden their international outlook, and sharpen their competitive edge on the global stage.

Scholarly inquiries have delved into various facets of EMI, such as students' learning hurdles (Hua, 2019), pedagogical strategies (Huang, 2012), assessment methodologies (Chung & Lo, 2021), learners' attitudes (Wu, 2006), and the affordances of EMI environments (Huang & Jhuang, 2015). Despite these valuable insights, one area that remains veiled in obscurity is the exertion of student effort throughout the EMI educational experience. This preliminary exploration seeks to illuminate the commitment and endeavors of students within their EMI contexts, representing an inaugural step toward a comprehensive understanding of their scholastic diligence.

This study aims to outline student effort dimensions in EMI classrooms and explore variations across genders, intentions for overseas studies, and English proficiency levels. It lays the groundwork for future research, potentially influencing EMI pedagogy policies and curricula.

2. Literature Review

English, as a global lingua franca, is crucial in international business, tourism, education, and research, driving the rise of English-Medium Instruction (EMI) globally (Wu & Tsai, 2022). Responding to this, Taiwan aims for Mandarin-English bilingual education by 2030, led by the National Development Council (2021). This policy spans K-12, overseen by the Ministry of Education and K-12 Education Administration

(2022), and higher education, supported by the National Development Council and the Ministry of Education.

Amid the push for bilingual education, research by Yeh (2012) explored Taiwanese EMI instructors' perspectives, stressing the importance of assessing students' readiness for EMI. Gupta and Lin (2023) called for scrutiny of Taiwan's EMI policies, investigating motivations, methodologies, and beneficiaries. Hua (2019) identified challenges in EMI, suggesting educators develop coping strategies. Le and Tang's (2022) comparative study emphasized instructors' teaching styles as crucial for successful EMI implementation.

Moreover, there are differences in English learning between students at universities and technological universities. Traditionally, Taiwanese students have preferred universities over technological universities due to the perception that regular universities hold a higher reputation. This preference is partly due to stereotypes about the relationship between the labor market and technological universities, as well as the lower academic requirements, such as English proficiency, for enrollment in technological universities in Taiwan (Su, 2005). Furthermore, there is a noted lower motivation for learning English among students at technological universities (Yeh, 2015). As a result, faculty at technological institutions have had to employ additional facilitations, such as web resources, to motivate students' English learning (Hsu, 2005).

Despite extensive EMI research, the study of technological university students' efforts during an EMI semester remains largely unexplored. This gap offers an opportunity to investigate students' perspectives on their efforts in EMI classrooms. Such inquiry could provide valuable insights into student engagement and learning strategies, optimizing EMI program delivery and outcomes.

3. Research Method

To uncover the nuances of students' learning efforts within English-Medium Instruction (EMI) classrooms, this study employed an exploratory approach, leveraging an open-ended questionnaire to elicit reflective responses from participants regarding their exertions in EMI learning at the semester's conclusion. To distill meaningful insights from the qualitative data thus gathered, the research methodology incorporated text analysis and the chi-square statistical test as primary analytical tools.

This study adopted convenience sampling with the researcher's 123 college

students from a technological university in southern Taiwan. Analysis was based on 112 valid responses, including 21 females and 91 males, covering various academic disciplines and English proficiency levels.

Participants were asked via a Google Form to detail extra efforts or changes made in their English class. The analysis occurred in two stages. Initially, two researchers independently identified themes and key ideas from responses, ensuring analysis reliability. Then, the frequency of learning effort dimensions was quantified based on thematic occurrences. A chi-square test, conducted using Python 3.12 and statistical libraries, determined statistically significant variations across gender, overseas study intentions, and English proficiency levels.

Due to the small size and convenience sampling, these findings are exploratory, but the research result is limited by the sample's scope. A larger-scale quantitative studies or qualitative interviews should be collected to validate student effort patterns in EMI settings, enhancing pedagogical strategies and support mechanisms.

4. Research Results and Discussion

(1) Overall Effort Dimension

The study analyzed students' learning efforts in EMI classrooms, with 146 valid entries from 112 participants. Student efforts were categorized into 11 groups, reflecting diverse strategies for improving English proficiency and academic performance in EMI settings (See Table 1 for details).

Table 1 Students’ Effort Dimensions Distribution and Percentage in EMI Learning

Effort Dimensions		Sub-category	Percentage	Main-category	Percentage
Main	Sub-category	n	%	n	%
4R	Speaking	25	17.12	44	30.14
	Listening	7	4.79		
	Reading	4	2.74		
	Watching (Read&Listen)	8	5.48		
Vocabulary		21	14.38	21	14.38
Create Video		11	7.53	11	7.53
Work Hard		25	17.12	25	17.12
Attitude	Active Learning	7	4.79	16	10.96

	Would Like to Try	9	6.16		0.00
Others		21	14.38	21	14.38
None		8	5.48	8	5.48
Total		146	100	146	100

Note: N=146, excluding 11 missing data.

Data analysis showed a significant focus on speaking practice and overall academic improvement, reported equally by 25 participants (17.12%). Vocabulary expansion efforts were noted by 21 students (14.38%), and educational video creation by 11 respondents (7.53%). Broader classifications revealed that efforts related to the 4Rs—listening, speaking, reading, and writing—accounted for 30.14% of items, while the attitude category, including active learning and embracing new challenges, comprised 10.96% of items.

The findings highlight a predominant focus on strengthening basic English literacy skills, with 65 mentions (44.52%) in the study sample. This includes both foundational 4R skills (30.14%) and vocabulary development (14.38%). This result echoes Su’s (2005) description of the low English proficiency of technological university students and needs improvement. There is also a significant improvement in positive learning attitudes, with 41 mentions (28.08%) indicating increased diligence, active engagement, and openness to experimentation and learning.

The study highlights the importance of English literacy and a growth mindset in students' academic journey within EMI courses. Students focus on improving English proficiency while also nurturing attitudes vital for effective learning and success. This dual emphasis promotes meaningful engagement and resilience, crucial for navigating EMI environments to fulfill the expectation of the Ministry of Education and K-12 Education Administration (2022).

(2) Effort Dimension in Gender

This section explores gender-specific differences in student efforts in the EMI classroom, analyzing how female and male students' exertions may vary. Due to the sample size disparity (female n=32, male n=114), a weighting approach was used. Female students' responses were weighted by a factor of 3.5625 to ensure balanced comparison and equitable representation in the findings presented in Table 2.

Table 2 Students’ EMI Effort Dimensions Distribution and Percentage in Gender

gender	Female Original	Female Weighted	Female Weighted	Male	Male Weighted	Sub- Total Weighted	Sub- Total Weighted
dimensions	n	n	%	n	%	n	%
Speaking	6	21.38	9.38	19	8.33	40.38	17.71
Listening	1	3.56	1.56	6	2.63	9.56	4.19
Reading	2	7.13	3.13	2	0.88	9.13	4.00
Watching	3	10.69	4.69	5	2.19	15.69	6.88
Read&Listen							
Vocabulary	3	10.69	4.69	18	7.89	28.69	12.58
Create Video	5	17.81	7.81	6	2.63	23.81	10.44
Work Hard	6	21.38	9.38	19	8.33	40.38	17.71
Active Learn	1	3.56	1.56	6	2.63	9.56	4.19
Would Like to Try	1	3.56	1.56	8	3.51	11.56	5.07
Others	4	14.25	6.25	17	7.46	31.25	13.71
None	0	0.00	0.00	8	3.51	8.00	3.51
Total	32	114.00	50.00	114	50	228.00	100.00

Note: The weighting method was employed to balance the male and female responses for comparative analysis, using a ratio of Male/Female, 114/32=3.5625. Consequently, the female effort dimensions were adjusted by a factor of 3.5625 times, resulting in a total N of 228, comprising 114 male and 114 weighted female responses. The weighting method was employed to balance the male and female responses for comparative

The study notes complete engagement of female students in learning efforts, contrasting with a small proportion (3.51%) of males reporting no specific efforts in EMI learning. Female students showed higher involvement (7.81%) in creating English videos compared to males (2.63%). This trend continued with females surpassing males in Reading (3.13% to 0.88%) and Watching online materials (4.69% to 2.19%).

Conversely, male students demonstrated a stronger focus on vocabulary enhancement, with 7.89% of males engaging in vocabulary-related efforts versus 4.69% of females. Similarly, male students reported a greater improvement in their learning attitudes (6.14%) compared to female students (3.12%), indicating a nuanced gender divergence in the approach to and prioritization of EMI learning efforts.

Both genders are actively improving English proficiency and academic performance in EMI settings, but they differ in focus and effort. Females favor creative engagement like content creation, while males prioritize language acquisition. Understanding these gender-specific strategies informs tailored pedagogical approaches to support diverse student needs and implements the mission of bilingual policy of National Development Council (2021).

(3) The Numbers of Students’ EMI Effort Dimension in Gender, Overseas Study, and English Levels

The exploration of students' effort dimensions in English-Medium Instruction (EMI) environments provides valuable insights into how various factors such as gender, intention for overseas study, and English proficiency levels influence learning engagement and strategies. Utilizing chi-square tests, this study scrutinizes the distribution and association of effort dimensions across these variables.

A. Quantitative Measures of Effort Dimensions by Gender Difference

A chi-square test examined gender differences in engagement levels across five effort dimensions (0, 1, 2, 3, 4) in EMI contexts. The sample included 21 females and 91 males. Effort dimension levels were distributed as follows: level 0 (n=8), level 1 (n=78), level 2 (n=20), level 3 (n=4), and level 4 (n=2) (see Table 3 for details).

Table 3 Frequencies and Chi-Square Results for Students’ Effort Numbers by Gender

	0 effort	1 effort	2 efforts	3 efforts	4 efforts	Total
Female	0	13	6	1	1	21
Male	8	65	14	3	1	91
Total	8	78	20	4	2	112

N=112, Chi-Square: 5.11, P= .275, Effect size: 0.106

The chi-square analysis yielded a nonsignificant association between gender and the number of learning effort dimensions, $\chi^2(4, N = 112) = 5.11, p = .275$, accompanied by a Cramer's V of 0.106. This result suggests a small effect size, as delineated by Cohen's (1988) benchmarks for statistical power: a small effect size is indicated by $V < 0.1$, a medium effect size falls within the range of $0.1 \leq V < 0.3$, and a large effect size is marked by $V \geq 0.3$. Notably, the calculation of expected frequencies for the cross-tabulation exposed that the smallest expected frequency was 0.375, thus breaching the chi-square test's assumption which anticipates expected frequencies to exceed 5 in all cells. Consequently, this limitation beckons a cautious interpretation of the chi-square test outcomes.

The analysis highlights gender dynamics in EMI learning. While the chi-square test didn't show a significant relationship, the small effect size suggests subtle gender differences in EMI engagement. Further research into gender-specific behaviors can help tailor EMI programs to support all students' educational achievements.

B. Quantitative Measures of Effort Dimensions in Relation to Students' Intentions

for Overseas Study

This segment of the study employed a chi-square test of independence to probe the correlation between students' aspirations for studying or pursuing career development overseas (categorized as Yes or No) and their engagement across five delineated effort dimensions within the context of English-Medium Instruction (EMI) classes (refer to Table 4 for detailed distributions).

Table 4 Frequencies and Chi-Square Results for Students' Effort Numbers by Overseas Study Intention

	0 effort	1 effort	2 efforts	3 efforts	4 efforts	Total
No	4	21	5	0	0	30
Yes	4	57	15	4	2	82
Total	8	78	20	4	2	112

N=112, Chi-Square=4.426, p=.351, Effect size= .099

The chi-square test's findings revealed no statistically significant correlation between the students' intentions for overseas study or career development and the range of their learning effort dimensions, $\chi^2(3) = 4.426$, $p = .351$. This result was further nuanced by the calculation of expected frequencies across the cross-tabulation of students' English proficiency levels by their learning improvement dimensions, uncovering the smallest expected frequency to be 0.535. This finding underscores a departure from the chi-square test's prerequisite that expected frequencies surpass 5 in all cells, thereby necessitating a cautious approach to interpreting these results. Additionally, the analysis yielded a Cramer's V of 0.099, indicative of a small effect size.

No significant statistical link was found between students' aspirations for international study or career development and their efforts in EMI classes. However, a small effect size suggests subtle variations in learning engagement associated with these intentions, though not statistically significant.

This insight suggests considering diverse motivations beyond career goals in EMI contexts. Educators and policymakers should design courses that cater to various aspirations and learning needs, fostering inclusivity and effectiveness. The collaboration between bilingual policy and international education would be a good policy (Huang et al., 2022).

C. Quantitative Measures of Effort Dimensions in Relation to Differences in Students' English Proficiency Levels

This investigation aimed to understand the impact of English proficiency levels on students' engagement efforts in EMI courses. Using a chi-square test, the study assessed the correlation between three proficiency categories (A1, A2, B1) and the variety of effort dimensions reported. Proficiency levels were distributed as follows: A1 (n = 25), A2 (n = 62), and B1 (n = 25) among participants (see Table 5).

Table 5 Frequencies and Chi-Square Results for Students' Effort Numbers by English Levels

	0 effort	1 effort	2 efforts	3 efforts	4 efforts	Total
A1	3	19	3		0	25
A2	5	41	13	2	1	62
B1	0	18	4	2	1	25
Total	8	78	20	4	2	112

N=112, Chi-Square=7.21, P=.514, Effect size=.179

The chi-square analysis concluded with no statistically significant relationship between students' English proficiency levels and the variety of their learning effort dimensions, evidenced by $\chi^2(8) = 7.21$, $p = .514$. The computation of expected frequencies underscored a violation of the chi-square test assumption, as the smallest expected frequency tallied at 0.428, falling short of the prerequisite greater than 5 for all cells. This discrepancy necessitates a cautious interpretation of the chi-square findings. Furthermore, the analysis calculated Cramer's V as 0.19, denoting a small effect size.

The lack of a significant link between English proficiency and learning effort dimensions suggests that proficiency doesn't strongly dictate students' efforts in EMI classes. However, minor variations in how students of different English levels engage with learning tasks are indicated by the small effect size noted by Cramer's V.

These findings urge reflection on how English proficiency subtly affects student engagement in EMI. Tailored support for individual effort dimensions can enhance course efficacy, making EMI accessible and beneficial for students at all proficiency levels. Moreover, this result denotes that EMI program could facilitate wide range of students with different English proficiency levels.

5. Conclusion and Implications

(1) Conclusion

This study investigated students' effort dimensions in EMI classes at a Taiwanese technological university, examining differences across genders, overseas study intentions, and English proficiency levels. Analyzing 112 valid responses, the research

highlighted students' efforts to improve English competency and academic performance. Key findings emphasized speaking practice, increased diligence, and vocabulary expansion as primary areas of effort, with gender differences noted but no significant variations found regarding overseas study intentions or English proficiency levels.

(2) Implications

Several implications are inferred. First, on pedagogical strategies, EMI educators should incorporate speaking practice, vocabulary expansion, and active learning strategies, catering to students' diverse effort dimensions. Second, on gender-sensitive approaches, gender differences in effort dimensions highlight the necessity for gender-sensitive pedagogical strategies. Addressing the unique challenges and preferences of male and female students promotes inclusive EMI classrooms. Third, support across proficiency levels, although no significant differences in effort dimensions were found across English proficiency levels, the small effect size suggests slight variations in engagement. Providing tailored support to students at different proficiency levels ensures all benefit from EMI courses. Fourth, on encouraging broad engagement, positive attitudes toward learning, seen in students' willingness to work hard and explore, show EMI programs' potential to foster a growth mindset. Encouraging broad engagement in learning activities enhances students' EMI experiences.

References

- Chung, C. L., & Lo, M. L. (2021). Do university EMI courses inevitably lead to worse teaching evaluations-A longitudinal case study. *Journal of Educational Research and Development*, 17(3), 41-70.
- Gupta, K. C. L., & Lin, A. M. (2023). English-medium instruction (EMI) in higher education in Taiwan: A review and critical reflection on why, how, and for whom. *Policies, Politics, and Ideologies of English-Medium Instruction in Asian Universities*, 63-76.
- Hsu, S. Y. (2005). Building language-learning environments to help technological university students develop English independent learning. *The Jalt Call Journal*, 1(2), 51-66.
- Hua, T. L. (2019). Understanding the Learning Challenges of English-Medium

Instruction Learners and Ways to Facilitate Their Learning: A Case Study of Taiwan Psychology Students' Perspectives. *Latin American Journal of Content and Language Integrated Learning*, 12(2), 321-340.

■ Huang, C. L., Liao, W. M., Tsai, I. H., Wang, H. Y., Huang, K. C., & Taylor, C. (2022). The feasibility, ideas, practices, and suggestions of implementing international education through English-medium instruction. *Tzu-Chi University Journal of the Educational Research*, 18, 69-108.

■ Huang, Y. P. (2012). Design and implementation of English-medium courses in higher education in Taiwan: A qualitative case study. *English Teaching and Learning*, 36(1), 1-51.

■ Huang, Y.-P., & Jhuang, W.-T. (2015). *Affordance of English-medium instruction contexts in Taiwan*. *Taiwan Journal of TESOL*, 12(1), 1-34. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1078935&lang=zh-tw&site=ehost-live>

■ Le, N. T., & Tang, C. W. (2022). Towards a comprehensive effectiveness scale for university students' perception of English medium instruction in Vietnam and Taiwan: an importance-performance analysis. *Journal of Multilingual and Multicultural Development*, 1-18.

■ Ministry of Education & K-12 Education Administration. (2022). *Implementation Project of Bilingual Instruction in Some Domains of Primary and Junior High School Education* (111 academic year). Retrieved from <https://www.tksh.ntpc.edu.tw/uploads/1641872193315K9MzpGm4.pdf>

■ Ministry of Education. (2023). *Bilingual study plan for college students*. Retrieved from <https://best.twaea.org.tw/webm/goodsimg/20230425184531.pdf>

■ National Development Council & Ministry of Education. (2022). Foresight infrastructure—Talent cultivation promotes employment construction: Bilingual nation policy by 2030 (2021-2024) (The first revision). Retrieved from https://www.edu.tw/News_Plan_Content.aspx?n=D33B55D537402BAA&sms=954974C68391B710&s=FB233D7EC45FFB37

■ National Development Council. (2021). 2030 Bilingual policy overall promotion

plan. Retrieved from https://www.ndc.gov.tw/Content_List.aspx?n=A3CE11B3737BA9EB&upn=5137965B2A81A120

- Su, M. H. M. (2005). A study of EFL technological and vocational college students' language learning strategies and their self-perceived English proficiency. *Electronic Journal of Foreign Language Teaching*, 2(1), 44-56.
- Wu, J. F., & Tsai, H. L. (2022). Research trends in English as a medium of instruction: A bibliometric analysis. *Journal of Multilingual and Multicultural Development*, 1-18.
- Wu, W. S. (2006). Students' attitudes toward EMI: Using Chung Hua University as an example. *Journal of Education and Foreign Language and Literature*, 4, 67-84.
- Yeh, C. C. (2012). Instructors' perspectives on English-medium instruction in Taiwanese universities. *Curriculum & Instruction Quarterly*, 16(1), 209-232.
- Yeh, H. (2015). Variations of Language Learning Strategy Use among Three Colleges at a Private Four-Year Technology University in Taiwan. *English Language Teaching*, 8, 183-196. <https://doi.org/10.5539/ELT.V8N11P183>.

