

Undergraduate Electrical Engineering Student's Perspectives on Lecturers' Teaching Methodologies at President University as EMI University

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Keywords:

English-Medium Instruction (EMI);
Teaching Methodologies;
Student Perception;
Engineering Education;
Reliability Analysis.

Abstract

English-Medium Instruction (EMI) has become increasingly important in higher education, particularly in engineering programs where English is widely used as the medium of instruction. This study aimed to investigate undergraduate Electrical Engineering students' perceptions of lecturers' teaching methodologies in EMI classrooms, particularly in the Control Systems course at President University. A quantitative descriptive survey design was employed, involving 21 undergraduate students. Data were collected using a 20-item questionnaire measured on a 6-point Likert scale. Instrument reliability testing demonstrated excellent internal consistency (Cronbach's alpha = 0.979). Data were analyzed using descriptive statistics, including frequencies, percentages, mean scores, and standard deviations. The findings revealed generally positive student perceptions of EMI teaching methodologies, with all questionnaire items obtaining mean scores above 4.00. Students reported that clear explanations, opportunities for interaction, and the use of supportive learning media enhanced their understanding and engagement in the learning process. Nevertheless, several students continued to experience challenges related to English language proficiency and technical terminology. These findings suggest that adaptive and student-centered teaching methodologies play an important role in maximizing learning effectiveness within EMI engineering classrooms.

INTRODUCTION

In an era characterized by globalization and Industry 4.0, acquiring globally recognized technical competencies has become increasingly imperative as they represent essential requirements for engineering graduates (Khan & Mourad, 2025). This demand has encouraged many higher education institutions worldwide, including those in Indonesia, to implement English-Medium Instruction (EMI) to prepare students for the global job market (Ahmed, 2025; Bolton et al., 2023; Glle, 2024; Luu et al., 2023; Sadiq, 2022; Simbolon, 2023). As an internationally oriented institution, President University implements full EMI in its Electrical Engineering program to bridge the gap between academic curricula and the requirements of multinational industries. In engineering education, EMI may take various forms, including full English instruction, selective translanguaging for concept clarification, or hybrid instructional models that combine English with limited native-language support. In this context, English functions not only as a communication medium but also as the primary medium for delivering complex engineering concepts. Previous studies have shown that EMI enhances global competitiveness while simultaneously presenting cognitive challenges for non-native English

speakers (Aldemir & Gülcan, n.d.). Overall, EMI represents a double-edged approach that requires careful pedagogical adaptation.

English-Medium Instruction (EMI) is defined as the use of English to teach academic subjects in countries where English is not the primary language (Ekoç, 2020). In the context of technical courses such as Control Systems, the primary challenge lies not only in understanding complex engineering principles and mathematical concepts (Kim et al., 2017; Schvarcz et al., 2024) but also in students' ability to process and absorb information delivered in a foreign language. The effectiveness of EMI depends heavily on the teaching strategies employed by lecturers to overcome language barriers (Aldemir & Gülcan, n.d.; Aznar-Mas et al., 2021). Effective teaching methodologies in EMI environments include the use of supportive learning media (Cho et al., 2021; Crisol-Moya et al., 2020), clear communication strategies, and material adaptation to enhance comprehension. Previous research has demonstrated that when lecturers provide clear explanations and utilize appropriate learning media, students' understanding of course materials improves despite language-related barriers (Cho et al., 2021; Crisol-Moya et al., 2020). These findings align with the view that adaptive and well-designed teaching methodologies are essential for effective EMI implementation (Aldemir & Gülcan, n.d.; Aznar-Mas et al., 2021). Student engagement in EMI classrooms is influenced by their confidence and comfort in interacting in English (Ayish, 2022; Schvarcz et al., 2024). Students tend to participate more actively and confidently in discussions when they are consistently exposed to an EMI environment supported by inclusive teaching practices (Ayish, 2022). However, adaptation levels vary, as students with lower English proficiency often experience difficulties in understanding technical terminology and following rapid explanations (Ekoç, 2020; Schvarcz et al., 2024).

Although EMI generally provides positive outcomes, it does not benefit all students equally (Sahan & Şahan, 2024). Differences in English proficiency remain key determinants of individual learning experiences (Ekoç, 2020; Kim et al., 2017). Common challenges reported in EMI contexts include difficulties understanding complex explanations delivered in English, limited confidence in speaking or asking questions during classroom interactions, and barriers to mastering specialized technical terminology (Schvarcz et al., 2024). These challenges highlight the need for additional support for students experiencing linguistic difficulties to ensure that they achieve comparable learning outcomes. Overall, existing literature suggests that while EMI provides significant opportunities to enhance global competitiveness, its effectiveness in engineering education depends on implementing adaptive teaching strategies that address both linguistic and cognitive demands. These strategies include interactive methodologies, visual learning support, and inclusive classroom practices that accommodate varying levels of English proficiency among students.

However, the implementation of EMI in engineering education has encountered considerable challenges. Students often experience a dual cognitive burden because they must simultaneously comprehend complex technical concepts, such as circuit analysis and electromagnetics, while processing information in a foreign instructional language. Despite lecturers' technical competence, teaching approaches that rely heavily on English-only verbal lectures may cause students to feel disconnected from the learning material (Widarta et al., 2023). This mismatch between instructional language and students' linguistic readiness can reduce motivation and result in suboptimal learning outcomes (Aguilar et al., 2020).

Nevertheless, existing studies have primarily emphasized language-related challenges, such as anxiety and comprehension difficulties, while providing limited attention to the pedagogical adaptations required in full EMI engineering classrooms. These challenges indicate the need for further investigation into teaching methodologies that better align with students' linguistic and cognitive needs in EMI engineering education (Dart et al., 2025; Yuan et al., 2023).

Previous research has indicated that the adoption of active learning methodologies can help mitigate challenges within EMI classrooms (Crisol-Moya et al., 2020). The integration of visual aids, simulation tools, and strategic translanguaging or limited use of native languages to clarify complex concepts has been shown to significantly enhance engineering students' understanding (Cho et al., 2021). Furthermore, pedagogical innovations have been proposed to support the simultaneous development of technical and linguistic competencies, including collaborative teaching approaches involving language specialists and engineering faculty. Overall, these findings suggest that active and adaptive teaching methodologies represent promising solutions for improving EMI learning effectiveness (Boelt et al., 2022).

At its core, effective EMI in engineering education requires not only adequate English proficiency but also teaching methodologies that support the comprehension of complex technical concepts. While existing literature has extensively discussed language barriers in EMI and evaluated teaching methods individually, limited research has examined how teaching methodologies should be adapted specifically for full EMI environments in electrical engineering education. Most previous studies have focused primarily on language anxiety and comprehension difficulties rather than broader pedagogical adaptations from the student perspective. Despite extensive discussions regarding EMI implementation and language-related challenges, empirical research examining pedagogical adaptation strategies within full EMI electrical engineering programs remains limited. Therefore, this research aimed to address this gap by investigating undergraduate Electrical Engineering students' perceptions of lecturers' teaching methodologies at President University. The findings are expected to provide practical recommendations for educators in aligning instructional approaches with student needs within EMI learning environments.

METHOD

This research employed a quantitative descriptive survey design to investigate students' perceptions of lecturers' teaching methodologies in English-Medium Instruction (EMI) classrooms. The study was conducted in the Electrical Engineering Study Program at President University, focusing on students enrolled in the Control Systems course.

The participants consisted of 21 undergraduate Electrical Engineering students selected through convenience sampling. Among the participants, 11 students (52.4%) were male and 10 students (47.6%) were female. The respondents were aged between 18 and 21 years, with a mean age of 19.52 years ($SD = 0.75$).

Data were collected using a structured questionnaire consisting of 20 items measured on a 6-point Likert scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). The questionnaire was adapted from previous studies on student perceptions of EMI learning environments and was reviewed by the research supervisor and course lecturer to ensure content validity and clarity.

Instrument reliability was assessed using Cronbach's alpha before data analysis. The reliability test produced a coefficient of 0.979, indicating excellent internal consistency and confirming that the questionnaire was reliable for measuring students' perceptions of teaching methodologies in EMI classrooms.

The collected data were analyzed using descriptive statistics, including frequencies, percentages, mean scores, and standard deviations. These analyses were used to identify patterns in students' perceptions of teaching methodologies, learning engagement, and comprehension within EMI classrooms.

RESULTS AND DISCUSSION

This study aimed to examine students' perceptions of teaching methodologies in English-Medium Instruction (EMI) classrooms, particularly in the Control System course. The reliability analysis yielded a Cronbach's Alpha coefficient of 0.979, indicating excellent internal consistency of the questionnaire. The average mean score across the 20 questionnaire items was 4.44 on a 6-point Likert scale, indicating generally positive perceptions toward EMI teaching methodologies among undergraduate Electrical Engineering students.

Table 1. Respondent Characteristics

Variable	Category	n	%
Gender	Male	11	52.4
	Female	10	47.6
	Total	21	100.0
Age	18 years	2	9.5
	19 years	7	33.3
	20 years	11	52.4
	21 years	1	4.8
	Total	21	100.0

Source: Primary Data, 2024

The respondents ranged from 18 to 21 years old, with a mean age of 19.52 years (SD = 0.75). Most participants were 20 years old (52.4%), followed by 19 years old (33.3%)

Table 2. Reliability Analysis

Measure	Value
Number of Items	20
Number of Respondents	21
Cronbach's Alpha	0.979

Source: Primary Data, 2024

Table 3. Descriptive Statistics of Questionnaire Items

Item	Mean	SD
Q1	4.67	1.32
Q2	4.57	1.29
Q3	4.67	1.39
Q4	4.86	1.65
Q5	4.05	1.43
Q6	4.48	1.44
Q7	4.67	1.43

Item	Mean	SD
Q8	4.43	1.47
Q9	4.57	1.43
Q10	4.62	1.28
Q11	4.14	1.42
Q12	4.43	1.43
Q13	4.10	1.34
Q14	4.43	1.25
Q15	4.29	1.38
Q16	4.10	1.41
Q17	4.10	1.55
Q18	4.38	1.40
Q19	4.48	1.29
Q20	4.38	1.32

Source: Primary Data, 2024

The findings revealed that all questionnaire items obtained mean scores above 4.00, indicating favourable perceptions across different aspects of EMI learning. The highest mean score was recorded for Item 4 ($M = 4.86$, $SD = 1.65$), suggesting that students perceived lecturers as providing sufficient opportunities for classroom interaction and participation. Items 1, 3, and 7 also received relatively high mean scores ($M = 4.67$). These items indicate that students positively evaluated lecturers' clarity of explanation in English, the effectiveness of learning media, and the support provided when learning difficulties occurred. These findings support previous studies highlighting the importance of interactive and student-centred teaching methodologies in enhancing learning effectiveness within EMI environments (Aznar-Mas et al., 2021; Crisol-Moya et al., 2020).

Furthermore, students generally reported active engagement in classroom activities and confidence in participating in EMI learning. Most engagement-related items achieved mean scores above 4.40, this finding indicates that language-related difficulties remain evident among some students despite the generally positive perception of EMI. This finding is consistent with (Cho et al., 2021) and ('Ayish, 2022), who emphasised that supportive instructional strategies and interactive learning environments contribute positively to student engagement and confidence in EMI settings.

Nevertheless, positive perceptions toward EMI did not entirely eliminate language-related challenges. Item 16, which measured students' difficulties in understanding materials delivered in English, obtained a mean score of 4.10. This finding suggests that although students generally viewed EMI positively, some still experienced difficulties in comprehending course content when English was used as the primary medium of instruction.

Despite the overall positive perceptions, several students reported challenges associated with EMI learning. Item 5 obtained the lowest mean score ($M = 4.05$, $SD = 1.43$). Since this item measured students' perceptions of lecturers' explanations of technical terms in English, the result suggests that technical terminology remains one of the primary challenges experienced by students in EMI engineering classrooms. A similar pattern was observed in Item 17 ($M = 4.10$), which assessed students' ability to understand technical terms presented in English. Together, these findings indicate that technical vocabulary may represent a persistent barrier even when students generally perceive EMI learning positively. In addition,

the relatively large standard deviations observed across several items ($SD = 1.25\text{--}1.65$) suggest variations in students' learning experiences and adaptation to EMI instruction. These findings align with previous research demonstrating that differences in English proficiency may influence students' ability to fully benefit from EMI classrooms (Ekoç, 2020; Kim et al., 2017; Schvarcz et al., 2024).

Overall, the findings indicate that EMI is generally perceived positively among undergraduate Electrical Engineering students and can effectively support learning and engagement when accompanied by appropriate teaching methodologies. However, language-related challenges continue to affect a minority of students, highlighting the importance of adaptive teaching approaches, clear explanations, visual learning support, and inclusive classroom interaction to accommodate varying levels of English proficiency.

Limitations

This study was limited by its relatively small sample size and its focus on a single course within one university. Consequently, the findings may not be fully generalizable to other engineering programs or EMI contexts. Future studies should involve larger and more diverse samples and examine additional factors influencing students' perceptions of EMI teaching methodologies.

CONCLUSION

This research aimed to examine students' perceptions of teaching methodologies in English-Medium Instruction (EMI) classrooms, particularly in the Control Systems course. The findings demonstrated generally positive perceptions of EMI teaching methodologies, as reflected by an overall mean score of 4.44 across the 20 questionnaire items. Students reported that EMI supported their understanding, engagement, and overall learning experience, although some students still experienced challenges due to language barriers (Ekoç, 2020).

These findings suggest that effective teaching strategies play a crucial role in enhancing student learning in EMI contexts. The results highlight the importance of using clear explanations, appropriate instructional methods, and supportive learning media to accommodate students' learning needs. This study provides important implications for lecturers and educational institutions, particularly in engineering programs, to adopt more adaptive and inclusive teaching approaches in EMI classrooms. Future research is recommended to explore additional strategies that can support students with lower English proficiency and improve their learning experiences in EMI environments.

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