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Examining the Role of Language in Teaching Technology: A Comparative Analysis of English and Filipino Instructional Approaches

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ABSTRACT The study aimed to compare English and Filipino as mediums of instruction in technology courses based on students' perceptions. It explored students' language experience in learning technology subjects in English or Filipino and assessed the impact of the language of instruction on their perceptions. The study employed a mixed-method approach, using an online survey with open-ended questions to gather data from 84 college students enrolled in technology-related courses in the Philippines. The results indicated that students generally have a higher proficiency in Filipino than English, and the majority felt equally comfortable with both languages in technology courses. The students' perceptions showed that language impacts their understanding, engagement, and overall performance in technology classes. In conclusion, the study provides insights into the importance of language in technology education and recommends incorporating bilingual instruction to cater to students' preferences and enhance their learning experiences.

INTRODUCTION

The importance of education in moulding the future cannot be stressed enough in this age of rapid technological breakthroughs and globalisation (Kolade and Owoseni 2022). As technology becomes more integrated into people's daily lives, one must modify the educational techniques to guarantee that the pupils are appropriately prepared to succeed in the digital age. The digital era has revolutionised the education landscape, leading to increased utilisation of technology as a tool for instruction and learning (Truong and Diep 2023). Within this context, language becomes a critical factor influencing the effectiveness of technology-based educational practices. Language choice becomes particularly relevant in technology instruction in multicultural and multilingual societies like the Philippines (Pham 2022). This study explores the role of language in teaching technology by comparing two widely used languages, that is, English and Filipino.

The role of language in technology education has been a subject of interest for researchers and educators alike (Sato and Loewen 2022). In addition, according to Umarova (2023), language serves as a communication medium through which knowledge is transferred from teachers to students. According to Eugenio and Ferrer (2023), language is a means of communication, and educational institutions have strongly emphasised this. Furthermore, it plays a crucial role in shaping students' understanding and engagement with technological concepts.

Language choice becomes extremely important when teaching technology courses or programs because of its effects on idea comprehension, student engagement, and resource accessibility. It is essential for forming students' perspectives, promoting inclusivity, and putting them on the path to successful technological careers. Both English and Filipino hold unique positions in the context of technology instruction, and understanding their impact is vital to ensure an effective learning environment for students.

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English has emerged as a global language of communication and is widely used in technology education worldwide. Many technology-related terms and concepts are predominantly presented in English. As a result, using English as an instructional language in technology classrooms allows students to access a vast amount of resources and information available in this language. English has emerged as the *de facto* global language of technology and innovation. It enjoys widespread usage in scientific literature, technical documentation, and digital resources. As a result, adopting English as the instructional language in technology courses provides students access to an extensive pool of information, cutting-edge research, and the latest technological developments. This accessibility to resources enables students to stay updated with advancements in the field and fosters a deeper understanding of complex technological concepts.

The importance of native language in teaching and learning technology courses cannot be overstated. There are many advantages to using students' native languages in the educational process. When incorporating the native language, such as Filipino, it is crucial to maintain a balance. In some instances, technical phrases might not have direct translations in the original tongue, and hence, it could be necessary to use English terminology to conform to industry norms and widespread communication styles. Filipino, as the national language in the Philippines, holds significant importance in the educational system (Tupas and Metila 2023). Filipino is the medium of instruction in most schools across the country. While using Filipino in technology instruction allows for better accessibility for students whose primary language is Filipino (Alvarez and Galman 2023), it may pose challenges concerning the availability of resources and technical terminology in Filipino.

This paper aims to examine and compare the role of language in teaching technology, specifically focusing on English and Filipino instructional approaches. Through a comparative analysis, this study seeks to identify the potential advantages and challenges associated with each language in the context of teaching technology. By exploring the impact of language on technology instruction, educators and policymakers can make informed decisions to enhance the effectiveness of technology-based learning environments.

Objectives of the Study

The study aimed to compare English and Filipino as mediums of instruction in technology courses based on the student's perceptions. It also aimed to explore the students' language experience with learning technology subjects in English or Filipino. In addition, it aimed to assess the impact of the language of instruction based on the students' perception.

MATERIAL AND METHODS

The study employed a mixed-method approach using a survey checklist with open-ended questions to gather the necessary data for the study. The data was gathered through an online survey using a Google Form survey. Quantitative data gathered in the study were analysed using descriptive statistics. On the other hand, qualitative data were analysed through coding and thematic analysis.

Data Gathering Procedure

The data were gathered through an online survey. Students were identified and emailed with the link to the Google Form survey. The survey participants of the study were 84 college students enrolled in technology-related courses from two higher education institutions in Bicol, Philippines. Participants were identified as students taking technology-related courses to ensure diversity in terms of language proficiency and cultural background.

Instruments

The survey questionnaires, which include the respondent's profile, open-ended questions, and a rating checklist to explore the students' preference for using English and Filipino medium in learning technology courses, were used as research instruments in this report. The questionnaire consisted of an open letter informing the respondent of the purpose of the study. The questionnaire is structured with questions to gather the profile of the respondents and ques-

tions to elicit an in-depth understanding of the role of language in teaching technology courses.

Data Analysis

The language proficiency level of students is analysed using mean and standard deviation. Paired Sample t-tests were also used to determine if there was a significant difference between the students' proficiency in English and Filipino. Meanwhile, their rating on the impact of the language of instruction was analysed using a five-point Likert scale with one as the lowest, indicating a 'strongly disagree', and five as the highest, indicating a 'strongly agree'. Qualitative data from the open-ended questions were analysed using coding and thematic analysis.

RESULTS

Language Proficiency

Table 1 presents the language proficiency level of students in two different languages, that is, English and Filipino.

Table 1: Language proficiency level of students

Language	*Mean*	*Std. Deviation*	*Interpretation*
English	2.6667	0.57735	Good
Filipino	3.3333	0.57735	Excellent

Legend: 1.00 - 1.75: Poor; 1.76 - 2.50: Fair; 2.51 - 3.25: Good; 3.26 - 4.00: Excellent

The mean score for English proficiency is 2.67, which indicates that students' proficiency level in English is 'Good'. The students' English language proficiency is deemed satisfactory, which provides optimism for their future academic and professional prospects. The standard deviation of 0.57735 indicates that the scores are relatively close to the mean, suggesting a moderate level of consistency in proficiency among the students. A lower standard deviation indicates that the scores are less dispersed, which suggests that the students' English competence is moderately consistent. Meanwhile, the mean score for Filipino proficiency is 3.3333, which indicates that the students' language proficiency in Filipino is considered excellent. This shows that most students speak Filipino fluently and with a high degree of command, allowing them to converse successfully, understand challenging texts, and express themselves clearly in various settings. The standard deviation of 0.57735 suggests that the scores are relatively close to the mean, indicating a moderate level of consistency in proficiency among the students. The students' level of Filipino language proficiency appears to be relatively uniform based on the modest consistency in proficiency. Based on this data, the students have higher language proficiency in Filipino compared to English.

Table 2 presents the results of a paired samples t-test comparing the language proficiency of college students, that is, English and Filipino.

The results of the paired samples t-test indicate a statistically significant difference between the language proficiency scores of the students in the English and Filipino conditions. The negative mean of the paired differences (-0.66667) suggests that, on average, the students performed better in Filipino than in English. This might be because of several things, including the advantages of their home tongue, the language of instruction, or the curriculum's emphasis on Filipino language proficiency. The t-value of -4.641 is large and significant, and the p-value is extremely small (likely rounded to zero). This indicates that the observed difference in language proficiency scores between the two conditions is unlikely to have occurred by chance and is likely an actual effect. The substantial t-value adds more evidence to the conclusion that there is a noticeable difference in the student's performance in English and Filipino. This result

Table 2: Comparison of the language proficiency level of students

	Paired differences						*Sig.*
	Mean	*Std. Deviation*	*Std. Error Mean*	*95% confidence interval of the difference*		*t*	*(2-tailed)*
				Lower	*Upper*		
English Filipino	-0.66667	0.65828	0.14365	-0.96631	-0.36702	-4.641	0.000

strengthens the conclusion that students routinely perform better in Filipino. The 95 percent confidence interval of the difference provides a range within which one can be 95 percent confident that the actual difference in language proficiency scores lies. In this case, the CI ranges from -0.96631 to -0.36702. Since the CI does not include zero, it confirms that the difference is significant. It supports the conclusion that the Filipino condition led to higher language proficiency scores than English. The statistical analysis suggests a significant difference in language proficiency scores between the English and Filipino conditions, with the students performing better in the Filipino state.

Language Preference in Technology Classes

Table 3 shows the proportions of students who feel comfortable with different language options (Filipino and English) when learning technology courses and those who feel equally comfortable with both options.

Table 1: Language proficiency level of students

Language	*Mean*	*Std. Deviation*	*Interpretation*
English Filipino	2.6667 3.3333	0.57735 0.57735	Good Excellent

Legend: 1.00 - 1.75: Poor; 1.76 - 2.50: Fair; 2.51 - 3.25: Good; 3.26 - 4.00: Excellent

When taking technology courses, most students (71%) reported feeling equally at ease with Filipino and English as language alternatives. This shows that they have a low preference for one language over another and are confident in their abilities to understand the subject regardless of the teaching language. The finding underscores the necessity of understanding and respecting students' linguistic preferences and degrees of comfort. This inclusive approach can result in more effective teaching, increased student involvement, and a more profound learning experience in technology classes. Regarding learning technology courses, 19 percent of the students picked Filipino as their preferred language option. These students feel more at ease learning technology-related topics in Filipino. Furthermore, the research showed that 10 percent of students picked English as their preferred language option when pursuing technology courses. These students learn technology-related topics in English more easily.

Based on students' answers to the open-ended questions in the study, it revealed that some students believe that using the Filipino language, including Taglish (a mix of English and Filipino), is beneficial. Reasons include ease of understanding, comfort, and the idea that it is the native language. The familiarity and comfort of using one's language are considered advantages. The Filipino language is deemed more accessible and can be easily understood.

In addition, many respondents lean towards English as the preferred language for learning technology concepts because they see English as the international language and the language of technology, making it easier to communicate and understand globally. Also, some terms and concepts in technology may translate poorly into Filipino or lose depth in translation. The necessity of knowing English for formal communication and international interactions is emphasised. English is considered more suitable due to its prevalence in technical terminology.

However, several participants suggest a balanced approach, using both languages to cater to a broader audience. This approach could involve teaching in English but providing explanations or translations in Filipino for those who may struggle with the language barrier.

In conclusion, the data presents a diverse range of perspectives. While some lean towards Filipino due to its familiarity and accessibility, others emphasise English's global reach and technical terminology. A few participants suggest a middle ground, advocating for a bilingual approach. The underlying theme in most responses is the desire to ensure students can effectively understand and learn technology concepts, regardless of the language used. Ultimately, the choice between English and Filipino could depend on the target audience's comfort level, language proficiency, and the balance between international exposure and local accessibility.

Perception of Language Impact

Table 4 reflects students' perceptions of the impact of language in teaching technology. The

data indicates the students' responses to different statements related to the impact of language on their learning experiences in technology classes. The responses were rated on a scale from 1.00 to 5.00, and higher scores indicate more substantial agreement with the statements.

Most students agreed that the language used in technology instruction affects their understanding of technical concepts (mean = 4.00). The standard deviation of 0.70711 indicates that the responses are moderately consistent. Similarly, most students agreed they feel more engaged and motivated in technology classes when the instruction is in their preferred language (mean = 4.10). The standard deviation of 0.70034 suggests a moderate level of consistency in responses. Students also agreed that the choice of language in technology classes affects their overall performance and learning outcomes (mean = 4.10). The slightly higher standard deviation of 0.88909 indicates more response variability than the previous indicators. Most students strongly agreed that proficiency in both English and Filipino is beneficial for learning technology (mean = 4.67). The standard deviation of 0.48305 indicates that responses are relatively consistent. The overall average of all indicators is 4.22, which indicates that students "Strongly Agree" that language impacts learning technology courses.

DISCUSSION

The mean language proficiency scores for English and Filipino are 2.67 and 3.33 respectively, which indicates that students have a good level of language proficiency in English and an excellent level of proficiency in Filipino. The research highlights how crucial it is to acknowledge and support students' fluency in English and their native language, such as Filipino. Recognising their strengths and offering individualised support can improve their linguistic capabilities, cognitive capacities, and general educational experience. The standard deviation for both languages is the same, indicating that the scores are relatively consistent around the mean, suggesting that the language proficiency levels are relatively uniform among the students in both languages. Overall, these indicate that the students have a higher level of language proficiency in Filipino compared to English, which may affect their academic performance and communication skills in the respective languages.

These findings align with the study of Altay et al. (2022), which demonstrated that students' language proficiency levels directly influence their academic performance, with more vital language skills leading to better outcomes in language-related subjects. Additionally, Morales et al. (2022) and Khaydarova and Afruza (2023) explored the significance of bilingualism in a multicultural society, emphasising how different language proficiency levels can shape an individual's communication abilities within various communities. Furthermore, a study by Protacio (2022) examined language learning strategies and identified that tailored approaches to each language could lead to more effective language acquisition among students.

Table 2 presents the results of a paired samples t-test comparing the language proficiency of college students in English and Filipino. The t-test examines whether a significant difference exists between the proficiency levels of the two languages within the same group of students.

Table 4: Students' perception of language impact on teaching technology

Indicator	*Mean*	*Std. Deviation*	*Interpretation*
The language used in technology instruction affects my understanding of technical concepts.	4.00	.70711	Agree
I feel more engaged and motivated in technology classes when the instruction is in my preferred language.	4.10	.70034	Agree
The choice of language in technology classes affects my overall performance and learning outcomes.	4.10	.88909	Agree
I believe proficiency in both English and Filipino is beneficial for learning technology.	4.67	.48305	Strongly agree
Average	4.22		Strongly agree

Legend: 1.00 - 1.80: Strongly Disagree; 1.81 -2.60: Disagree; 2.61 - 3.40: Neutral; 3.41- 4.20: Agree; 4.21- 5.00: Strongly Agree

The mean paired difference between English and Filipino language proficiency is -0.66667. The negative value suggests that students have higher proficiency in Filipino than English. The t-value is -4.641, and the p-value is 0.000. The extremely small p-value indicates high statistical significance. This means that the language proficiency difference between English and Filipino is unlikely to have occurred by chance, supporting the conclusion that the difference is real and significant. Based on the findings, it can be inferred that Filipino language proficiency is significantly higher than English language proficiency among the students in this study. The outcome indicates a significant skill gap between Filipino and English among students. This conclusion emphasises the necessity for deliberate strategies to improve English language competence while preserving the robustness of Filipino language abilities. The competence gap can be addressed, and students can be guaranteed to flourish in both languages using tailored instructional methodologies, curriculum modifications, and targeted support.

Table 3 shows the proportions of students who feel comfortable learning technology courses with different language options (Filipino and English). Most students (71%) feel equally comfortable with both languages, indicating no strong preference for one language in technology education. However, 19 percent of students prefer Filipino as their preferred language option, while 10 percent prefer English. This suggests that some students have a language preference when studying technology-related topics.

Most students feeling equally comfortable with Filipino and English languages indicates that a flexible bilingual approach to instruction could be effective in technology education. Such an approach allows students to access learning materials and engage with course content in their preferred language, fostering a positive learning environment and promoting better learning outcomes. The study's findings highlight how adaptable students are and how willing they are to learn about technology in both Filipino and English.

The findings align with previous research on bilingual education and language preferences in the classroom. Studies have shown that a flexible bilingual approach can benefit students, allowing them to access information in their preferred language, leading to better understanding and knowledge retention (Sandberg 2023; Wawire and Barnes-Story 2023). Research on language preferences in education has demonstrated that students' comfort and confidence in using a particular language can significantly impact their learning experiences and academic success (Sandberg 2023). This is evident in the current study, where students' comfort with Filipino and English is associated with a lack of strong preference for one language over the other when studying technology courses. Furthermore, studies on language attitudes and identity have indicated that cultural and sociolinguistic factors can influence students' language preferences (Turdaliyevich 2022; Pawlak et al. 2022). In this study, the preference for Filipino or English as the language of instruction in technology courses may be influenced by the students' cultural background and language identity.

Educators can use this information to tailor their teaching methods and course materials to accommodate students' language preferences. Providing bilingual resources and materials can ensure that all students, regardless of their language background, have equal opportunities to excel in technology courses. This inclusivity can help enhance students' motivation and engagement, leading to improved academic performance.

Table 4 provides insights into the students' perceptions of the impact of language on teaching technology. The students agree that the language used in technology instruction affects their understanding of technical concepts and enhances their engagement and motivation in technology classes. They also believe that the choice of language in technology classes has implications for their overall performance and learning outcomes. Furthermore, a significant majority of students strongly agree that having proficiency in both English and Filipino is beneficial for learning technology. Overall, Table 4 suggests that students have positive perceptions of the impact of language in teaching technology and recognize the importance of language proficiency in their academic success.

Table 4 suggests that students perceive language substantially impacts their learning experience in technology classes. Most students agreed that the language used in technology

instruction affects their understanding of technical concepts and influences their engagement and motivation in these classes. Furthermore, students believe that the choice of language in technology classes can affect their overall performance and learning outcomes. Additionally, there is a strong consensus among students that having proficiency in both English and Filipino is beneficial for learning technology.

These findings are consistent with the study of Lasagabaster (2012) and Karakus et al. (2022) that emphasises that the language of instruction can have a considerable impact on students' understanding of complicated technical topics (Lasagabaster 2012; Karakus et al. 2022). Students perform better and display higher levels of engagement and motivation when taught in a language they are skilled in and comfortable with (Sanusi et al. 2023; Sandberg 2023). Furthermore, research on bilingual education has stressed the advantages of students learning in both their native and second languages. Studies have shown that bilingualism improves cognitive capabilities, problem-solving ability, and academic accomplishment (Ibanez 2023; Charoenphon 2023). The fact that students strongly feel that knowing both English and Filipino is advantageous for studying technology is consistent with the benefits of bilingualism documented in the literature.

CONCLUSION

The study thoroughly overviews students' language skill levels and their perspectives on language effect in technology instruction. According to the research, pupils have a fair level of English proficiency and an exceptional level of Filipino proficiency on average. Furthermore, Filipino language proficiency appears to be much higher among the students in this study than English competency. Additionally, in technical classes, students often feel at ease with both languages, with only a tiny percentage expressing a preference for either Filipino or English. According to their perceptions of its impact on teaching technology, language favours students' understanding, engagement, and overall performance.

RECOMMENDATIONS

Given that students generally possess a strong proficiency in both English and Filipino, adopting a bilingual approach to instruction is recommended. This approach will cater to the diversity of language skills among students and help ensure that all students can effectively engage with technology concepts. In addition, by using both languages strategically, instructors can provide a more inclusive learning environment. Acknowledging the exceptional Filipino proficiency students demonstrate, instructors can consider incorporating more Filipino language explanations and examples into their technical instruction. This can enhance students' comprehension and engagement, as content delivered in a language students are highly proficient in can facilitate a deeper understanding. The study suggests that students generally feel comfortable with both languages. However, a small percentage may prefer either Filipino or English. Instructors should be flexible in accommodating these preferences whenever possible. This can create a more positive learning experience and enhance students' motivation to engage with technology concepts.

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