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Navigating Challenges in Technical English: Insights from Learners at a Malaysian Polytechnic

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Abstract: *This paper investigates the challenges faced by learners of DUE10062 Technical English1, a specialized form of English used in professional and academic contexts, in a Malaysian Polytechnic. Through this study, the key obstacles such as limited vocabulary, comprehension difficulties with technical texts, and the lack of practical application in real-world scenarios are of key concerns. The findings reveal that learners often struggle with the jargon and nuanced language specific to their fields, which can hinder their language learning performance and understanding. The implications of these challenges must be addressed for curriculum development and teaching strategies, emphasizing the need for targeted instructional materials and practices that bridge the gap between theoretical knowledge and practical usage. This research contributes to a deeper understanding of the complexities of Technical English and offers recommendations for improving learner outcomes in this critical area of communication.*

Keywords: ESP (English for Specific Purposes), language learning, content and language integration

1. Introduction

English language learning in the higher education institution in this era pose a different landscape to help learners navigate in the current wave of globalized workforce. Several research studies have shown that the acquisition of language is most effective if it is to be allied in the learners' field of study (Abdul Raof & Masdinah, 2006; Racca & Lasaten, 2016; Watzinger-Tharp et al., 2018; Fitria, 2023). The study by Poedjiastutie (2017) further strengthen the notion that learning English for Specific Purposes (ESP) has become essential, particularly for students in technical fields who must navigate complex industry-specific terminology and concepts.

Pedagogically, the primary goal of ESP is to equip learners with communication skills tailored to their specific professional fields. More specifically, integrating content and language is essential, as this approach is believed to optimize learners' language application in realistic, simulated contexts (Bui, 2022). However, for this to be achieved, there is a need to close the gap of proficiency of the language acquisition and understanding in the shift from learning general English (GE) for daily use in their secondary school to learning the language in integration of complex industry-specific terminology and concepts in their higher education institution.

2. Literature Review

To further understand the implementation of ESP in the Malaysian education context, there is a need to scale back from its root, when the Dual-Language Programme (DLP) was implemented in 2016, in place of the previously executed policy in 2002, The Teaching of Science and Mathematics in English (PPSMI) policy. With the PPSMI policy proven to be a failure after a decade of its implementation on various levels, and in response to the resistance from schools and stakeholders, the Ministry of Education (MOE) was forced to revert the policy in 2012 (Ha et al., 2013). The introduction of DLP was the direct response from MOE to cater the persistent request of some groups that these subjects are to be taught in English (Ashairi et al., 2020).

The DLP was introduced in the teaching and learning of Science and Mathematics (STEM) subjects, in which the system advocated the use of both Malay and English languages. Even though this is, theoretically, a well- rounded system, a preliminary study by Ashairi et al. (2017) stated that while language proficiency does play a role in shaping the moderate levels of readiness and confidence among DLP students, the findings also revealed that students faced difficulty in understanding scientific terms, questions, and explanations in English, due to their limited vocabulary and basic English skills. The following years, Ashairi et al. (2018 & 2019) observed a positive attitude positive attitudes toward their language abilities and their willingness to learn using English. Though the students recognize the importance of learning Science and Mathematics in English for future careers and global communication, the struggle in vocabulary skills is still evident. Students struggle to understand technical vocabulary, terminologies and sentence structures that are rarely encountered in everyday conversation. They too expressed frustration with their inability to quickly grasp and remember terms, which hindered their overall understanding of content. Therefore, greater efforts are needed to enhance students' vocabulary, which could ultimately make learning these subjects more accessible.

As schools in Malaysia is implementing DLP, one common misconception was that the transitioning from secondary school to learning English for specific purposes (ESP) for students enrolled in technical field of study will not pose any challenges to the students. Several research studies have shown findings contradicting to this misconception. Fang & Liu (2020) in their research, stated that the separation of the English language and the STEM classroom hinders the student’s vocabulary comprehension. The use of the ESP language is confined only to the STEM classroom and not enriched in the English classroom; hence the opportunity to polish on the jargon, terms and vocabulary is very limited (Junaini et al., 2019; Sabirin et al., 2020).

3. Methodology

This study utilizes a descriptive research design that aims to explore the students’ challenges in learning Technical English. A public technical institution in Sarawak was selected as the venue for the study. The study was conducted at the end of the semester, after which the respondents had completed their DUE10062 Technical English 1 course.

3.1 Population and Sample Size

For this study, respondents are students enrolled in DUE10062 Technical English 1 class. They were chosen through purposive sampling in which the respondents are in Semester 1 from 4 different engineering programmes, which are Civil Engineering, Mechanical Engineering,

Electrical Engineering and Petrochemical Engineering. Purposive sampling is employed as it can efficiently and effectively limit the pool of potential participants in a research study, focusing on those most relevant to the research objectives (Thomas, 2022). The total number of students enrolled in the course is 520 students and this research requires 15% or at least 78 students from the population. From that, the total number of respondents participating in this study are 137 or 26.3% of the population.

3.2 Data Collection and Analysis

The data collection method in this study is through a questionnaire form adapted from Enesi et al. (2021) and Solihah et al. (2023). Both previous research findings emphasized on the challenges faced in their respective institutions in terms of learning English for Specific Purposes (ESP), with the most predominant and critical challenge being vocabulary mastery. With the research findings and similar concern that exist in the researcher's institution, the questionnaire questions were then adapted and adopted to better suit the need and the environment of which this study is conducted.

The questionnaire for this research is divided into three parts. The first part of the questionnaire is on the respondents' demographic data. The data collected includes the respondents' field of study, and level of English proficiency. The second part is on challenges faced by the respondents, focusing on technical vocabulary, and the third part is on the respondents' learning strategies. The questionnaire was distributed online via Google Forms to the respondents, with the aim to answer the following research questions.

1) What are the specific challenges learners face with technical vocabulary in Technical English?
2) How do learners overcome difficulties with specialized terminology, precision, and context-specific meanings?

Data collected were analysed using the Statistical Package for the Social Sciences (SPSS) and findings are further discussed in the following chapter of this research.

4. Findings and Data Analysis

4.1 Demographic data

We started the data analysis by analysing the respondent's demographic data in terms of their technical field of study, their self-perceived level of English proficiency and the frequency of them encountering with unfamiliar terms in their Technical English course.

Table 1: Technical Field of Study

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Electrical engineering	24	17.5	17.5	17.5
	Mechanical engineering	50	36.5	36.5	54.0
	Civil engineering	38	27.7	27.7	81.8
	Petrochemical engineering	25	18.2	18.2	100.0
	Total	137	100.0	100.0	

As shown in Table 1 above, majority of the respondents are from Mechanical engineering department, with 50 respondents or 36.5% from the overall total. This is followed by respondents from Civil engineering department, with 27.7% or 38 respondents responding to the questionnaire. The last two engineering departments, which are Petrochemical engineering

and Electrical engineering, recorded only 18.2% or 25 respondents and 17.5% or 24 respondents respectively.

Table 2: Level of English Proficiency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Beginner	25	18.2	18.2	18.2
	Intermediate	92	67.2	67.2	85.4
	Advanced	19	13.9	13.9	99.3
	Expert	1	.7	.7	100.0
	Total	137	100.0	100.0	

Next, Table 2 indicates the respondents self-evaluation of their level of English proficiency. Majority, at 92 respondents or 67.2% rate their English proficiency as intermediate. 18.2% or 25 respondents acknowledged their proficiency are at the beginner's level, while 13.9% or 19 respondents deemed their English level is at an advance level. From this, only 1 out of 137 respondents, or only 0.7%, perceived their English proficiency is at an expert level.

Table 3: How do you encounter unfamiliar technical terms in your field of study?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	5	3.6	3.6	3.6
	Often	25	18.2	18.2	21.9
	Sometimes	81	59.1	59.1	81.0
	Rarely	24	17.5	17.5	98.5
	Never	2	1.5	1.5	100.0
	Total	137	100.0	100.0	

And lastly, Table 3 displays the frequency of the respondents encounter with unfamiliar technical terms throughout their course. 59.1% or 81 respondents mentioned that they sometimes encounter with unfamiliar technical terms, and 18.2% or 25 respondents responded often. 17.5% or 24 respondents said they rarely encounter unfamiliar terms, while 2 responded never.

4.2 Challenges Faced by the Students

In this second analysis, we investigated the respondents' difficulties in learning technical vocabulary compared to general English and what is the main challenge that they face in the Technical English course.

Table 4: Difficulties learning technical vocabulary compared to general English?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very difficult	5	3.6	3.6	3.6
	Somewhat difficult	22	16.1	16.1	19.7
	Neutral	78	56.9	56.9	76.6
	Somewhat easy	27	19.7	19.7	96.4
	Very easy	5	3.6	3.6	100.0
	Total	137	100.0	100.0	

As can be seen above in Table 4, the analysis result is to investigate if the students are having difficulties in learning technical vocabulary compared to learning general English. From the analysis, the majority of the respondents, at 78 respondents or 56.9%, indicated that they are

neutral on that statement. 19.7% or 27 respondents responded that it is somewhat easy for them to learn technical vocabulary, and this contradicts with 16.1% or 22 respondents stating that it was somewhat difficult for them to learn technical vocabulary compared to general English. The remaining respondents responded at both extreme scales with 5 respondents or 3.6% respectively, to the statements that they find it very difficult, and they find it very easy to learn technical vocabulary compared to general English.

Table 5: Which of the following aspects of technical vocabulary do you find the most challenging?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Limited knowledge of specialized terms	23	16.8	16.8	16.8
	Difficulty understanding precise meanings of terms	33	24.1	24.1	40.9
	Trouble remembering technical terms	33	24.1	24.1	65.0
	Acronyms and abbreviations	10	7.3	7.3	72.3
	Difficulty applying technical terms in real-world scenarios	21	15.3	15.3	87.6
	Struggle with the context-specific meanings of terms	17	12.4	12.4	100.0
	Total	137	100.0	100.0	

Table 5 shows the analysis on the most challenging aspect of learning technical vocabulary. Most respondents responded that in learning technical vocabulary, they encounter difficulties in understanding the precise meaning of technical terms and are having trouble remembering the terms, with 24.1% or 33 selecting these options, respectively. 16.8% or 23 respondents stated that they have limited knowledge of the specialized terms used in their technical field of study, and 15.3% of respondents mentioned that they find it difficult to apply the technical terms in real-world scenarios. Only 12.4% or 17 respondents struggle with the context-specific meaning of terms and 7.3% find acronyms and abbreviations to be challenging to them.

4.3 Learning Strategies

As we identified the challenges that the respondents faced, we too investigated how the students coped in overcoming these challenges in terms of their learning strategies.

Table 6: Learning strategies

	N	Mean	Std. Deviation
Looking up definitions in a dictionary or online	137	3.85	.944
By watching videos/tutorials	137	3.78	.945
Asking teachers or classmates for clarification	137	4.12	.805
Using context clues to infer meanings	137	3.50	.859
Writing down and revising new vocabulary regularly	137	3.64	.872
Relating terms to real-life examples	137	3.86	.917
Valid N (listwise)	137		

For this part, we employ the use of a five-point Likert scale. As the scale is an interval scale, the mean value will be employed in interpreting the result. With that, the mean value of 1–1.8 is presented as not effective, 1.81 – 2.6 are somewhat effective, 2.61 – 3.4 are considered as neutral, 3.4 – 4.2 are effective and 4.21 – 5 are very effective. As observed from Table 6, generally all the respondents responded within the range of 3.41 – 4.2, which is effective. The statement with the highest mean at 4.12 was that asking teachers or classmates for clarification on technical vocabulary was mostly preferred in assisting the learner grasp their lesson better.

Next, the respondents stated that relating the technical terms to real-life examples (M=3.86) and using the dictionary or seeking the definition online (M=3.85) helped them to better comprehend the technical vocabulary. The statement with the lowest mean at 3.50 was learning the technical vocabulary by using contextual clues to infer meaning.

5. Discussion

The findings of this research aligned with the findings of several previous research. Research by Maruyama (2006) in which, in his study with the electrical engineering students in Japan, acknowledged that the learners are lacking in terms of technical vocabulary, due to their limited knowledge of the specialised words as they were not common in general English. Also, due to this, the students struggle with applying the terms in a real-world context. On that note too, Suzini (2011) encounters similar trends of challenges faced by the learners in learning English for Specific Purposes (ESP) compared to general English. The need to bridge the gap between the respondent's schemata of general English and Technical English (TE), a form of ESP, must be addressed to help the learners comprehend and perform better in both language learning and the content of their field of study. As per the preferences in learning strategies, the respondents are more inclined towards engaging in a more social strategy by asking their peers and lecturers. This is consistent with the findings made by Noor & Amir (2009) and Al Zahrani & Chaudhary (2022) where in their research have shown similar results.

However, this research has its own limitations as we only investigated the challenges faced by the students. To further examine the effectiveness of the new DUE10062 Technical English 1 course, a future research opportunity to investigate the lecturer's perspective is worth looking into. Also, as the course stabilised, the assessment method and instruction too, is another window of opportunity to further address the issue of technical language comprehension of the subject-matter.

6. Conclusion

The findings of this research underscore the importance of addressing these challenges through curriculum enhancements and targeted teaching strategies. Thus, it contributes valuable insights into the intricacies of Technical English acquisition, proposing actionable steps to improve educational outcomes for students striving to master this vital form of communication.

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