

Need Analysis of an English for Specific Purposes (ESP) Course for Indonesian Vocational Tertiary Students

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ABSTRACT

The expanding use of English as a lingua franca for occupational, commercial, educational and industrial purposes has resulted in the global need for English for Specific Purposes (ESP) instruction in the English language teaching curriculum, especially in Indonesian context. However, most of the ESP courses offered are unable to address the students' specific needs. Hence, this study investigates the role of needs analysis in ESP courses in vocational tertiary education level before designing any English Language Teaching curriculum in Indonesian context. Different yet interrelated sources of data collection including a set of closed-ended questionnaires, semi-structured interviews and classroom observation protocol were used to collect the relevant data. A total of 85 second-year students from a state polytechnic in Bandung, West Java, participated in this study. The results reveal that although knowledge of the four English language skills was figured out to be important for the students for being successful in both academic (educational) and professional (working) contexts, proficiency in speaking and reading was deemed to be of vital importance. The fulfillment of their academic targets, preparation for a better future, and becoming global citizens are the three perceived overarching reasons for the students to learn English. Accordingly, although students' individual needs are basically subjective and unstable across contexts, this study's findings can serve as a possible aid to decision-making in the contexts linking English language learning in vocational tertiary education to the broader professional world.

KEYWORDS:

English for specific purposes (ESP);
Need analysis;
Course design;
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Introduction

Research on needs analysis for English for Specific Purposes (henceforth ESP) course design and implementation, particularly in the field of STEM (Science, Technology, Engineering, and Mathematics), has been consistently growing in the ASEAN higher education institutions

(Basturkmen, 2022; Chen et al., 2018; Petraki & Khat, 2020). In the context of this study, English for STEM purposes (STEM ESP) refers to English instruction designed to support students' discipline-specific academic and professional communication needs within technical and engineering-related fields. This focus is particularly relevant to engineering education, where English proficiency is increasingly required to understand technical documentation, access scientific and technological information, and participate in professional and industrial communication. This has become increasingly important as the ASEAN Community's Vision 2045 is to realize a developed ASEAN community as the epicenter of growth in the Indo-Pacific region (ASEAN, 2025). Therefore, the use of English as a lingua franca for occupational and industrial purposes, as well as an academic lingua franca for education and research, is highly imperative.

In response to this need, many universities, polytechnics, and other tertiary educational institutions developed undergraduate ESP courses without conducting a needs analysis of students' targeted English-language proficiencies (Petraki & Khat, 2020). Several studies have reported that ESP programs frequently emphasize institutional or occupational expectations while giving limited attention to students' perspectives, concerns, and actual learning needs (Chemir & Kitila, 2022; Talib et al., 2026). As a result, the teaching of ESP often remains insufficiently aligned with students' academic and professional communication demands and the linguistic realities of the workplace. Therefore, it is essential to investigate the current needs of targeted students to assess whether the objectives of an ESP program have been achieved or require revision or evaluation (Chatsungnoen, 2015).

Several studies have been conducted over the decades to investigate the various needs of ESP courses and teaching practices in many parts of the world (Alsamadani, 2017; Chemir & Kitila, 2022; Chen et al., 2018; Prikazchikov, 2024), especially in ASEAN contexts (Basturkmen, 2022; Chatsungnoen, 2015; Petraki & Khat, 2020). Mostly, the findings of the previous studies have implied that students may end up disappointed with their achieved English proficiency level once they enter the workplace because their individualized language needs and interests were neglected, and those specific language needs are not determined based on proper language use (Li & Fu, 2021; Xu et al., 2020). Traditional teaching methods, which focus mostly on translating terms and writing sentences, were among the problems found in ESP classroom practices, resulting in poor student performance (Yasmin et al., 2016). The above-mentioned points emphasize the importance of conducting a comprehensive needs analysis to identify students' target-language needs, learning preferences, and expected communicative competencies in academic and professional contexts.

Needs analysis (NA) is the initial stage in designing any language course (Li & Fu, 2021). This approach has become associated with the field of ESP rather than general English language teaching (ELT) because its primary purpose is to determine the target students' needs in a specific domain of English usage. According to Flowerdew (2012), needs analysis refers to techniques for gathering and assessing information pertinent to course design; it serves as the foundation for determining the what and how of a course (its effectiveness). In ESP research, NA commonly involves two major dimensions: Present Situation Analysis (PSA) and Target Situation Analysis (TSA). PSA focuses on learners' current language proficiency, existing communicative abilities, and learning difficulties, whereas TSA examines the language skills and competencies required in future academic, occupational, or workplace contexts. To obtain comprehensive information regarding these aspects, multiple stakeholders, including students, lecturers, course designers, and professionals, are often involved in NA research, providing diverse yet complementary perspectives. This enables

researchers to identify both the needs of students and lecturers, as students are not always aware of their future needs, and lecturers may not always be aware of the challenges their students face (Chiu et al., 2021; Fitria, 2023).

ESP refers to an English language course tailored to address the specific learning needs of a specific learner or group of learners within a defined timeframe, where general English instruction is inadequate (Orr, 2015). Therefore, certain matters need to be considered before designing an ESP course. As Dudley-Evans and St. John (1998) suggest, course designers should be aware of the students' linguistic disciplines and the particular 'study skills' necessary for their academic program and, later, their work. In engineering education, for instance, such study skills may include understanding technical documentation, interpreting scientific information, writing project reports, and communicating technical ideas in academic and workplace settings. Accordingly, ESP courses should focus on developing the language and communicative competencies necessary for students to succeed in both formal educational environments and industry-related contexts. This emphasis on discipline-specific needs distinguishes ESP from English as a Foreign Language (EFL) and general English Language Teaching (ELT), particularly in instructional approaches and the prioritization of students' academic and occupational requirements.

One reason for the growing popularity of ESP in recent years is that broad methodologies for English language instruction have not demonstrated significant effectiveness for students or working professionals with specialized academic or occupational language requirements. In the context of Indonesian vocational tertiary education, little empirical research (Fitria, 2023; Y. I. H. Sari et al., 2020; Syakur et al., 2020) has examined the specific needs of ESP courses and the relationships among majors, students' needs, and English language proficiency. Most of the previous studies focused only on the (vocational) high school education level (Kaharuddin. et al., 2019; Kamaruddin et al., 2021; F. P. Sari & Wirza, 2021). Hence, the purpose of this study is to investigate the key reasons and needs for learning English (for engineering purposes) at the vocational tertiary education level, based on the present and target situation analysis. The findings of this study can contribute to the discourse of improving the quality of ESP teaching practices. Thus, the present study addresses the following research inquiry: (1) What are Indonesian vocational tertiary students' overall perceptions and attitudes toward the ESP course they recently took? (2) What specific English language skills (listening, reading, speaking, and writing) and activities do Indonesian vocational tertiary students need to develop in both their academic and professional contexts?

Method

Research Design

This study employed an explanatory sequential mixed-methods design to provide significant insights and perspectives from participants regarding the needs and reasons for learning ESP at the vocational tertiary education level. An explanatory sequential mixed-methods research design is a two-phase approach in which quantitative data are collected and analyzed first, and the resulting findings guide the collection of qualitative data to provide a deeper explanation of the results and a more comprehensive understanding of the phenomenon under investigation (Ary et al., 2010). It integrates paradigms and philosophical and theoretical perspectives, allowing researchers to collect, analyze, and interpret both numerical (quantitative) and descriptive (qualitative) data (Creswell & Creswell, 2023). Accordingly, this

method was appropriate for this study, as it encompasses the complexity of multiple data levels and analyses from divergent perspectives (Huang et al., 2022; Park, 2021).

Research Site and Participants

Aiming to gain insights into the ESP needs of vocational tertiary education students, this study involved 85 second-year (third-semester) students majoring in Automation Engineering at a state polytechnic in Bandung, West Java, Indonesia. These participants represented the entire third-semester Automation Engineering cohort enrolled during the data collection period. The cohort comprised four classes, with 69 male and 16 female students, aged 18 to 21 years (see Table 1 for demographic details). Second-year (third-semester) students were purposively selected for several reasons. Having completed approximately two years of English instruction for engineering purposes, they were expected to have developed fundamental competence in the four language skills and to have shaped perceptions of their English proficiency and learning needs. At the same time, some students may still experience limitations in their English language abilities. Therefore, their feedback was considered particularly valuable for evaluating and improving the existing ESP course.

Table 1. *Demographics of the participants*

Profile	Frequency	Percentage
Gender		
• Male	69	81.2%
• Female	16	18.8%
Total	85	100%
Age		
• 18 years old	1	1.1%
• 19 years old	40	47%
• 20 years old	34	40%
• 21 years old	10	11.7%
Total	85	100%

Research Instruments and Data Collection

To build upon the comprehensive understanding of language needs for practical use, this study used a set of questionnaires, semi-structured interviews, and a classroom observation protocol to collect the relevant data.

First, a set of 49 closed-ended questionnaire items was constructed. The questionnaire comprised several sections, including demographic information, self-perceived English proficiency, attitudes toward ESP, and students' current ESP needs. All items were measured using a five-point Likert scale. The instrument was adapted from several questionnaires employed in previous ESP needs-analysis studies (Alsamadani, 2017; Chatsungnoen, 2015; Hutchinson & Waters, 1987; Taillefer, 2007) and subsequently modified to suit the context of vocational engineering students at the polytechnic under investigation. The researchers extracted common features from these established instruments and adapted them to reflect the participants' specific educational and professional context. Although the source instruments had been previously validated in published studies, the internal

consistency of the adapted questionnaire was re-examined using the present dataset. The results indicated satisfactory reliability, with Cronbach's alpha coefficients ranging from .862 to .933 across the principal questionnaire sections. In addition, an Indonesian version of the questionnaire was also distributed to ensure participants' comprehension of the items and to facilitate accurate responses.

Next, the semi-structured interview served as one of the data-gathering instruments to support the questionnaires. The semi-structured interview can develop a relationship with respondents, provides opportunities for clarification to obtain additional information, and allows for the collection of both in-depth and broad data (Chemir & Kitila, 2022; Petraki & Khat, 2020). Following the preliminary analysis of the questionnaire responses, all 85 respondents constituted the sampling frame for the qualitative phase. From this cohort, 15 students were randomly selected and invited to participate in individual semi-structured interviews. The interview protocol was developed based on the questionnaire findings and focused on students' perceptions of the ESP course and their English-language needs in academic and professional contexts. Each interview lasted approximately 15 – 20 minutes and was conducted in a setting that allowed participants to express their views comfortably. To minimize anxiety and encourage candid responses, participants were informed of the study's objectives and assured that all information would be treated confidentially.

Lastly, the classroom observation protocol is required in the NA process to examine specific activities and tasks within specific learning contexts, thereby supporting the collection of clear and comprehensive data (Dudley-Evans & M.J, 1998). It is important to note that the classroom observation corroborated and enriched the interview findings; therefore, the results were integrated into the qualitative analysis. A total of 10 observation sessions were carried out during the ESP classes attended by the participating students. The observations focused on the students' engagement in classroom activities, the use of English during learning tasks, interactions between students and lecturers, and the implementation of ESP-related instructional practices. The observations were conducted by the researchers in a non-participant observer role and documented using an observation protocol accompanied by detailed field notes. The observation data were subsequently used to triangulate and corroborate the findings obtained from the questionnaires and semi-structured interviews.

Data Analysis

Descriptive statistics were employed to analyze the questionnaire data because the study's primary objective was to identify and describe students' perceptions, attitudes, and English language needs, rather than to examine differences between groups or test causal relationships. Although the participants were drawn from four classes, they were treated as a single cohort for analysis. Accordingly, frequencies and percentage distributions were considered appropriate and sufficient to address the research questions and provide an overall profile of the students' ESP needs.

To analyze the qualitative data consisting of interview transcripts, Braun and Clarke's (2006) six steps of thematic analysis were adopted to provide a rich, detailed, yet complex account of the data. The steps include 1) familiarization with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) writing the report. In addition, the researchers also worked with other experienced researchers in the related field of study to identify recurring themes with the inductive coding method. To enhance the trustworthiness and credibility of the analysis, the interview transcriptions were independently reviewed and coded by the researchers and two experienced qualitative

researchers. The coders subsequently compared their coding decisions, and any discrepancies were discussed and resolved through consensus until agreement was reached on the final coding categories and themes. The resulting themes were then interpreted and integrated with the quantitative findings to provide a more comprehensive understanding of the phenomenon under investigation.

Results

The results of this study are presented in two categories: quantitative and qualitative. Both are presented to answer the research questions. The quantitative result was obtained from the set of questionnaires, whereas the qualitative result was obtained from both the interview and classroom observation protocols.

Quantitative Results

Students' English Proficiency Levels, Perceptions, and Attitudes

To begin with, the students were asked to rank their abilities in the four English language skills from very weak (1) to very good (5) as part of the survey. The descriptive statistics in Table 2 show that their self-evaluated English proficiency levels range from "weak" to "very good" across the four skills.

Table 2. *Students' self-evaluated English proficiency levels*

Item	Very Good		Good		Moderate		Weak		Very Weak		Total F	Total %
	F	%	F	%	F	%	F	%	F	%		
Listening	8	9.4	30	35.3	39	45.9	8	9.4	0	0	85	100%
Reading	21	24.7	38	44.7	24	28.2	2	2.4	0	0	85	100%
Speaking	5	5.9	18	21.2	36	42.4	26	30.6	0	0	85	100%
Writing	7	8.2	31	36.5	37	43.5	10	11.8	0	0	85	100%

Note: F = Frequency

In Table 2, it can be seen that most students acknowledged and felt confident that they had "very good" reading skills (24.7%), followed by listening (9.4%), writing (8.2%), and speaking (5.9%). On the other hand, it was also revealed that most of them acknowledged having "weak" speaking skills (30.6%), indicating that the students perceived productive oral skills as more challenging than receptive skills, which made them feel less confident about engaging in communicative activities in English. Nevertheless, these findings should be interpreted cautiously because they are based on self-assessment rather than standardized proficiency measures.

The disparity between receptive (reading, listening) and productive (speaking, writing) skills, as shown above, suggests an imbalance in students' present linguistic competencies. The relatively high self-ratings for reading proficiency may be attributable to students' frequent exposure to written English materials, including textbooks, technical manuals, and online resources related to their field of study. Notably, targeted vocational tertiary students tend to develop receptive skills (reading and listening), which, according to the classroom observation protocol, are practiced more in their classrooms than productive skills (writing and speaking). That is why productive skills often lag behind receptive skills in English (Alsamadani, 2017).

The disparity in students' English proficiency levels may be attributed to lecturers' perceptions and understanding of the significance of specific English skills for their students' learning objectives or future professional development.

Furthermore, the students were asked to rank the importance of the four English skills in both their academic/educational and professional/working contexts (Table 3) from 1 = unimportant to 5 = very important to assess their perceptions and attitudes toward learning English. The results are presented below.

Table 3. *Students' Perceptions and attitudes of the importance of English in both their academic and professional contexts*

Levels	Very Important		Important		Moderately Important		Less Important		Unimportant		Total F	Total %
	F	%	F	%	F	%	F	%	F	%		
Academic (Education) Context												
Listening	57	67.1	27	31.8	1	1.2	0	0	0	0	85	100%
Reading	56	65.9	27	31.8	2	2.4	0	0	0	0	85	100%
Speaking	60	70.5	21	24.7	4	4.7	0	0	0	0	85	100%
Writing	51	60	30	35.3	4	4.7	0	0	0	0	85	100%
Professional (Working) Context												
Listening	68	80	17	20	0	0	0	0	0	0	85	100%
Reading	64	75.3	21	24.7	0	0	0	0	0	0	85	100%
Speaking	71	83.5	13	15.3	1	1.2	0	0	0	0	85	100%
Writing	63	74.1	22	25.9	0	0	0	0	0	0	85	100%

Note: F = Frequency

In Table 3, speaking received the highest percentage of responses (70.5%), indicating its importance in students' academic context, followed closely by listening (67.1%) and reading (65.9%), while writing received the lowest percentage (60.0%). Similarly, in the professional context, speaking received the highest percentage (83.5%), followed by listening (80.0%), reading (75.3%), and writing (74.1%).

The findings reveal an interesting contrast between students' self-perceived proficiency and their perceived language needs. Although reading was previously reported as one of their stronger skills, speaking was consistently ranked as the most important skill in both academic and professional contexts. This suggests that students may perceive oral communication as increasingly important for presentations, discussions, and workplace interactions within engineering-related environments. As Alzahrani et al. (2022) stated, being proficient in English also signals professionalism, competence, and readiness for responsibility. Nevertheless, the differences in importance ratings among the four language skills were relatively small, particularly in the academic context. Consequently, the rankings should be interpreted as general indications of students' preferences rather than as evidence of substantial differences in perceived importance.

Drawing on the findings presented in Table 3, it can be inferred that the participants, as both tertiary education students and future engineering professionals, recognize the value of English across academic and workplace contexts. In particular, the high emphasis on speaking suggests that students view English as a practical communicative resource for

participating in academic discussions, delivering presentations, collaborating with others, and engaging in professional interactions in engineering-related fields.

Students' Perceived Needs for ESP Course Design

The following results highlight the language needs of tertiary engineering students by asking them to rank the importance of the four language skills in different communicative activities they frequently engage in.

Table 4. *Students' perceived needs for ESP course design*

Communicative Activities	Very Important		Important		Moderately Important		Less Important		Un-Important		Total F	Total %
	F	%	F	%	F	%	F	%	F	%		
Listening												
Receiving spoken instructions/advice/comments	44	51.8	33	38.8	8	9.4	0	0	0	0	85	100%
Listening to lecturers	39	45.9	31	31.8	15	17.6	0	0	0	0	85	100%
Listening to your peers	29	34.1	33	38.8	22	25.9	1	1.2	0	0	85	100%
Listening to presentations and discussions in international meetings/seminars/conference	44	51.8	28	32.9	13	15.3	0	0	0	0	85	100%
Listening to television/radio program, movies, and other English media	39	45.9	32	37.6	14	16.5	0	0	0	0	85	100%
Reading												
Reading textbooks and PowerPoint presentations	37	43.5	41	48.2	7	8.2	0	0	0	0	85	100%
Reading scholarly articles/journals/publications	34	40	39	45.9	11	12.9	1	1.2	0	0	85	100%
Reading manuals, instructions, or technical description	47	55.3	32	37.6	5	5.9	1	1.2	0	0	85	100%
Reading signs, rules, and notices in a laboratory	48	56.5	30	35.3	7	8.2	0	0	0	0	85	100%
Searching for information from the internet	43	50.6	35	41.2	6	7.1	1	1.2	0	0	85	100%
Speaking												
Introducing yourself and others in a variety of situations	49	57.6	30	35.3	5	5.9	1	1.2	0	0	85	100%
Giving a presentation	38	44.7	37	43.5	10	11.8	0	0	0	0	85	100%

Asking-answering questions and stating ideas/opinions during the class discussions	35	41.2	38	44.7	11	12.9	1	1.2	0	0	85	100%
Speaking to foreigners/foreign guests	38	44.7	40	47.1	6	7.1	1	1.2	0	0	85	100%
Promoting and explaining a product	39	45.9	37	43.5	8	9.4	1	1.2	0	0	85	100%
Writing												
Writing examination answers	23	27.1	29	34.1	22	25.9	9	10.6	2	2.4	85	100%
Writing laboratory reports or assignments	26	30.6	27	31.8	26	30.6	6	7.1	0	0	85	100%
Writing research papers and scholarly articles for scientific journals	37	43.5	32	37.6	12	14.1	4	4.7	0	0	85	100%
Writing e-mails	29	34.1	36	42.4	16	18.8	4	4.7	0	0	85	100%
Writing a curriculum vitae or resume	42	49.4	36	42.4	5	5.9	1	1.2	1	1.2	85	100%

Table 4 indicates that reading obtained the highest aggregated importance score ($\Sigma = 209$), followed by speaking ($\Sigma = 199$), listening ($\Sigma = 195$), and writing ($\Sigma = 157$). However, these rankings should be interpreted with caution because the activities grouped under each language skill differ in scope, complexity, and communicative purpose. For example, reading activities ranged from reading signs and notices to reading scholarly articles and technical documents, while writing activities included both routine and specialized engineering-related tasks. Consequently, the aggregated scores should be regarded as indicative of general patterns of students' perceived language needs rather than definitive evidence that one language skill is inherently more important than another. Nevertheless, the findings suggest that English is perceived to play an important role across a wide range of academic and professional activities. For instance, among the speaking-related activities, "introducing yourself and others in a variety of situations" received the highest level of perceived importance, with 49 students (57.6%) rating it as "very important," highlighting the value students place on oral communication in both educational and workplace contexts.

Among the reading-related activities, "reading signs, rules, and notices in a laboratory" received the highest proportion of "very important" responses (56.5%), indicating that students place considerable value on the ability to comprehend workplace and laboratory-related information. Regarding listening skills, "receiving spoken instructions, advice, and comments" and "listening to presentations and discussions in international meetings, seminars, and conferences" emerged as the two highest-ranked activities, each receiving 51.8% of responses in the "very important" category. These findings suggest that students perceive listening as essential for both immediate workplace communication and participation in broader professional and academic interactions. With respect to writing, "writing a curriculum vitae or résumé" obtained the highest proportion of "very important" responses (49.4%). This result may reflect students' awareness of the importance of English proficiency for employment-related purposes and future career development.

Qualitative Results

To support the existing data, the participants were asked for their viewpoints about the reasons for learning English (for engineering purposes) using semi-structured (interview) questions.

Table 5 presents the three overarching themes that emerged inductively from the interview data through the thematic analysis procedure proposed by Braun and Clarke (2006). The first theme, “fulfillment of academic targets”, was mentioned by 14 of the 15 participants. The second theme, “preparation for future life”, was mentioned by 11 participants, while the third theme, “becoming a global citizen”, was mentioned by 10 participants. The prominence of these themes suggests that students perceive English as an important resource for both their academic development and future professional engagement. In particular, the vast majority of students believed that learning English is beneficial for supporting their academic studies, especially in accessing engineering-related textbooks, technical documents, and other discipline-specific resources. The following excerpt illustrates this perception.

In my opinion, learning English will help me achieve better academically and in the future because most of the information and worldwide knowledge is in English; therefore, learning it (English) will open the window to the world, thereby opening the window to knowledge as well. (P3/male, personal communication, 2025)

The excerpt above shows that the students acknowledged English’s role as a global language and a tool for advancing their academic goals. Previous studies, such as Chemir and Kitila (2022) and Li and Fu (2021), also found that engineering tertiary students agreed that they studied English for better academic purposes. They suggest that English functions as the primary language of global academic communication, as a large proportion of textbooks, scholarly articles, key concepts, terminologies, and instructional materials are served in English.

Furthermore, most students believed that learning English provides a better future for them, particularly in advancing their career opportunities and professional status. The following is an excerpt from the interview session with one of the participants.

I personally want to work in one of the prominent, globally oriented industries. Without learning English well, I think it will be difficult and improbable for me to compete for those jobs. [...] As an engineering student aspiring to become a professional engineer, I am sure that English will help me interact with engineers from other countries in the future workplace. (P5/male, personal communication, 2025)

The above excerpt shows that the students acknowledged the role of English in providing access to a wider range of employment opportunities, particularly in multinational companies, as well as in facilitating participation in international training programs and professional certification schemes. This complements the questionnaire results presented in Table 4, “writing a curriculum vitae or résumé”. Taken together, these findings suggest that students perceive English not only as an academic requirement but also as an important asset for career preparation and professional advancement. This is in line with Kawsar (2023) and Rana and Shaikh (2024), who reported that English proficiency significantly expands employment opportunities and enhances career prospects across various international

industries and sectors. They further argued that individuals with advanced English proficiency are more likely to be considered for managerial and leadership positions in contexts where English is associated with professional competence and social prestige.

Moreover, the students believed that learning English could make them more confident about traveling around the world. The following is an excerpt from the interview session with one of the participants. "With good proficiency in English, I do not need to rely on others when traveling abroad because I feel more independent and confident exploring the targeted countries" (P12/female, personal communication, 2025).

The excerpt above suggests that students perceive English as a useful means of initiating conversations, building social relationships, and engaging in intercultural exchanges while traveling abroad. Since English functions as a global lingua franca, proficiency in English helps individuals reduce uncertainty and increase a sense of communicative control in unfamiliar environments when traveling abroad (Iglesias et al., 2024; Lasanowski, 2011). Interestingly, this finding extends beyond the immediate academic and professional requirements of engineering-related communication. While the ability to communicate internationally may support future engineering careers in multinational and cross-cultural settings, the students' responses also suggest a broader aspiration to engage with the global community through travel and intercultural interaction. Therefore, the theme of becoming a global citizen appears to reflect both discipline-specific professional needs and more general English-as-a-lingua-franca motivations.

Table 5. Summary of the analysis of students' perceived needs and attitudes towards learning English

Overarching Theme	Category	Descriptor
Fulfillment of academic targets	Learning English is beneficial	• To past examinations • Becoming a well-qualified student • Feeling smarter than others • To participate in international seminars/workshops • Feeling more confident • Feeling 'cool' • Having different flex
Preparation for future life	Learning English provides better future	• To graduate from the polytechnic • To get employed immediately • To apply for global industries • To continue to a higher level of education
Becoming global citizens	Learning English makes one confident to travel the world	• To communicate and interact with foreigners • To travel around the world with friends and family • To have a foundation for international communication

Discussion

Both the quantitative and qualitative findings indicate that vocational tertiary students place considerable importance on both reading and speaking skills, suggesting a need to balance receptive and productive language development. Nevertheless, the findings also highlight the continued importance of listening and writing skills for students' academic and professional purposes. This finding differs from that of Chiu et al. (2021), who argued that students should prioritize developing receptive skills before focusing on oral communication. One possible explanation for this divergence lies in the vocational engineering context of the present study.

As Automation Engineering students are expected to engage in presentations, discussions, project collaboration, and workplace interactions, they may perceive speaking skills to be as important as reading skills for their future academic and professional success. This interpretation is supported by the questionnaire results, which identified reading and speaking as the two most highly valued language skills, as well as the interview findings, in which students emphasized the role of English in achieving academic goals, preparing for future careers, and participating in global communities. These findings suggest that vocational engineering students require the simultaneous development of receptive and productive skills rather than a sequential progression from one skill set to another. More broadly, they reinforce the view that ESP needs are highly context-dependent and should be aligned with the specific communicative demands of students' academic disciplines and future workplaces.

In the teaching-learning context, the findings suggest that effective ESP instruction should incorporate collaborative learning activities that encourage students to exchange ideas, solve problems collectively, and communicate technical information with peers. Such activities may include engineering case presentations, peer-to-peer technical briefings, project progress reports, discussions of laboratory procedures, and simulated workplace meetings. Through these tasks, students can develop both their communicative competence and their ability to articulate engineering concepts in English. This recommendation is consistent with Li and Fu (2021) and Sari and Wirza (2021), who found that learning activities should move beyond self-directed learning toward collaborative and communicative approaches. Their studies further emphasized the need for ESP materials and tasks that promote oral interaction and productive language use. Furthermore, Chen et al. (2018) argued that technological resources should also be integrated into tertiary English instruction to facilitate interactive learning environments, such as online project presentations, virtual discussions, and technology-assisted collaborative tasks that mirror contemporary engineering workplace practices.

Furthermore, students with low levels of English proficiency require careful consideration and systematic support before implementing a targeted ESP course. Such proficiency gaps are commonly observed in EFL contexts, including Indonesia (Kaharuddin. et al., 2019; Renandya et al., 2018; Syakur et al., 2020). To address these disparities, institutions may consider administering diagnostic language assessments at the beginning of the program to identify students' strengths and weaknesses, followed by pre-ESP foundation modules or bridging courses focusing on core academic English, engineering-related vocabulary, and basic oral communication skills. Since current constraints may limit students' ability to meet the linguistic demands of their target academic and professional contexts, this study's findings highlight the importance of incorporating students' perspectives into ESP course design. Doing so may help ensure a more balanced development of receptive and productive language skills while better aligning instructional materials with students' actual needs and proficiency levels.

Conclusion

This study has examined the key reasons and needs for learning English for engineering purposes in vocational tertiary education, based on present situation analysis (PSA) and target situation analysis (TSA). The findings confirm the strong support for incorporating ESP courses into existing English language programs. Although all four language skills were perceived as important for success in both academic and professional contexts, speaking and

reading emerged as the two most highly valued skills. Furthermore, the qualitative findings revealed that the fulfillment of academic targets, preparation for a better future, and becoming global citizens constituted the three overarching reasons motivating students to learn English.

Despite these contributions, several limitations should be acknowledged. The study was conducted at a single state polytechnic and involved only students from the Automation Engineering program, which may limit the transferability of the findings to other vocational higher education settings and engineering disciplines. In addition, students' English proficiency levels were based primarily on self-evaluation, and the quantitative data were analyzed using descriptive statistics without inferential testing. Therefore, future studies may expand the scope of investigation by involving multiple institutions and engineering disciplines, incorporating objective measures of language proficiency, and including industry stakeholders to obtain a more comprehensive understanding of students' academic and professional English language needs.

Moreover, this study offers a transferable example of how needs analysis informs the design and evaluation of ESP courses, particularly in engineering-related vocational higher education contexts. Although students' language needs are inherently dynamic and may vary across educational and professional settings, the findings provide contextually grounded insights that may support curriculum developers, ESP practitioners, and policymakers in making informed decisions about how to align English language instruction with workplace and academic demands. Future research may extend this needs-analysis framework to other engineering disciplines and institutional contexts and incorporate industry stakeholders to gain a more comprehensive understanding of the communicative competencies required in contemporary professional environments.

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