



Needs Analysis of English for Specific Purpose at Engineering Students in Vocational High School

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ABSTRAK

Pengajaran Bahasa Inggris untuk siswa teknik dikategorikan sebagai English for Specific Purposes (ESP). Penelitian ini bertujuan untuk mengetahui kebutuhan pembelajaran Bahasa Inggris pada jurusan Teknik Instalasi Tenaga Listrik, Teknik Otomasi Industri, Desain Pemodelan dan Informasi Bangunan, serta Konstruksi dan Bisnis Properti di SMKN 3 Tanjungpinang. Metode penelitian yang digunakan adalah deskriptif kualitatif dengan instrumen kuesioner dan wawancara yang melibatkan 26 responden, terdiri dari 25 siswa dan 1 guru Bahasa Inggris. Hasil penelitian menunjukkan bahwa siswa membutuhkan peningkatan keterampilan berbicara, penguasaan kosa kata, tata bahasa, dan pengucapan. Metode pembelajaran seperti Contextual Teaching and Learning serta Task-Based Learning perlu diterapkan untuk mendukung proses pembelajaran. Kesulitan utama yang dihadapi adalah kurangnya penguasaan berbicara dan pengucapan, serta keterbatasan kosa kata. Siswa juga menyukai media pembelajaran berbasis video dan interaktif. Implikasinya, guru perlu mengembangkan metode pengajaran yang lebih komunikatif dan menggunakan media yang menarik agar pembelajaran lebih efektif dan relevan dengan kebutuhan siswa.

ABSTRACT

English teaching for engineering students is categorized as English for Specific Purposes (ESP). This study aims to determine the English learning needs of the Electrical Power Installation Engineering, Industrial Automation Engineering, Building Modeling and Information Design, and Construction and Property Business departments at SMKN 3 Tanjungpinang. The research method used is descriptive qualitative with questionnaire and interview instruments involving 26 respondents, consisting of 25 students and 1 English teacher. The results of the study indicate that students need to improve their speaking skills, vocabulary, grammar, and pronunciation. Learning methods such as Contextual Teaching and Learning and Task-Based Learning need to be applied to support the learning process. The main difficulties faced are the lack of mastery of speaking and pronunciation, as well as limited vocabulary. Students also like video-based and interactive learning media. The implication is that teachers need to develop more communicative teaching methods and use interesting media so that learning is more effective and relevant to students' needs.

1. INTRODUCTION

English is recognized as an international language and serves as the standard medium of communication among people worldwide. Its use extends beyond politics and foreign affairs to play a vital role in education, including communication between lecturers and foreign students during the learning process. English skills are essential in various aspects of life such as work, education, and daily interactions.

In Indonesia, where English is not the mother tongue or first language, students must formally study English to gain proficiency. According to (Indrasari, 2016), English is considered a compulsory subject and is incorporated into the curriculum across all departments in schools and universities. In addition to formal education, English is also offered through various courses in non-formal educational institutions.

However, preliminary observations reveal that many English teachers tend to rely solely on textbooks without developing specific lesson plans tailored to their students' needs. This approach may lead to ineffective learning outcomes. Therefore, it is essential for teachers to understand and analyze students' learning needs. English for Specific Purposes (ESP) focuses precisely on this by addressing students' requirements to communicate effectively in their professional environments.

This research responds to the urgent need for a thorough needs analysis to ensure that English lessons align with students' specific goals, preventing lessons from straying off course. Understanding students' needs is crucial because it can significantly improve the efficiency and effectiveness of both teaching and learning. Specifically, this study aims to gather data on engineering students' current English skills, their learning needs, and their aspirations for future proficiency. In today's competitive job market, having an advanced command of professional engineering terminology and communication skills is a considerable advantage. Unlike general English courses, English learning for engineering students involves specialized vocabulary, formats, and structures tailored to the field.

As emphasized by (Rackevičienė et al., 2019; Wu & Lou, 2018), effective learning occurs when students focus on terminology and communication skills directly relevant to their profession. This distinction underscores the importance of designing specialized teaching strategies for engineering students. Therefore, it is essential to investigate the ESP needs of students majoring in engineering. This research specifically aims to explore the English learning needs of engineering students at a Vocational High School in Tanjungpinang, providing insights that can help improve ESP teaching practices in this context.

2. METHODS

The present research is a qualitative descriptive research design. This approach aligns with the research questions and problem formulation, seeking to provide descriptive insights into students' needs and perceptions regarding English learning (Creswell, 2012; Mack et al., 2005).

Following qualitative research principles, participants and research settings were selected purposively to ensure relevant and rich data collection on the topic. This study focuses on understanding the experiences and perspectives of engineering students in a natural learning environment, utilizing verbal and linguistic data to explore their demands and perceptions about English instruction (Moleong, 2007:6).

The research subjects consisted of engineering students at a Vocational High School in Tanjungpinang. These participants were chosen deliberately based on their direct involvement in English learning within the engineering context, ensuring that the data gathered would be meaningful for addressing the study's objectives.

Data collection involved two primary instruments: questionnaires and interviews. The questionnaires were designed to gather quantitative data on students' English proficiency levels, learning needs, and preferences. These data were analyzed using descriptive statistics, where the average score for each questionnaire item was calculated by dividing the total score by the number of respondents. The use of Google Forms enabled automatic data analysis, facilitating efficient processing of questionnaire results.

For the qualitative data obtained through interviews, analysis followed the (Miles & Huberman, 1994) model, which consists of three key stages:

- a. Data Reduction – Sorting and filtering responses to focus only on those relevant to the research objectives, eliminating irrelevant or unnecessary information.
- b. Data Display – Organizing the reduced data into concise narrative descriptions that are easy to interpret and understand.
- c. Verification and Drawing Conclusions – Interpreting the organized data to derive meaningful conclusions supported by the findings.

This combined methodological approach enables a comprehensive exploration of the engineering students' English learning needs, ensuring both breadth and depth in understanding the phenomenon under study.

3. RESULT AND DISCUSSION

Results

Needs analysis is a way to discover the differences or gaps between what students already know and what they want to know (Nation & Macalister, 2010). This research aims to determine the needs of engineering students for English subjects, which focuses on 3 (three) aspects, namely (1) Necessities (what the learner has to know to function effectively) - needs, (2) Lacks (what the learner knows and does not know already) – weaknesses, and (3) Wants (what the learners think they need) – the desire (Hutchinson & Waters, 1987) to achieve the goal (why a course is being taught and what the learners need to get from it) – (purpose) of learning English.

Before discussing necessities, lacks and wants, it is necessary to know the objectives of Engineering students for learning English as conveyed by the English teacher.

(Respondent JA)

"Tujuan sebenarnya pasti untuk komunikasi, menjadi seorang pekerja teknik harus bisa menguasai speaking, salah satunya harus memperhatikan tingkat kemahiran Bahasa Inggris yang diharapkan

menjadi sangat penting karena pasti berkomunikasi dengan rekan yang tersebar di seluruh dunia, kebanyakan materi yang diajarkan sesuai dengan textbook lebih ke menulis, makanya anak-anak harus bisa belajar extra mandiri agar terpenuhi untuk speaking"

In general, it can be concluded that learning English is for various purposes, such as access to knowledge, further study, and employment, because English is considered a communication language that can connect various people from different backgrounds and for simple communication.

a. Necessities

Target needs, which refer to needs, are what students really need to improve their English learning. Based on the data collection results, this can be seen in the diagram below.



Diagram 1. English Language Ability

The data presented indicates that speaking is the most critical English language skill for engineering students, with 56% of respondents prioritizing it. This emphasis on speaking aligns with the demands of the engineering profession, where effective communication is essential. (Balasubramani & Thim, 2020) highlight that engineering students must develop proficiency in all four language skills—listening, speaking, reading, and writing—to meet the expectations of multinational companies and global industries. Furthermore, (Lopes, 2021) underscores the necessity for engineers to possess strong communication skills to collaborate effectively with colleagues from diverse backgrounds and operate in international settings.

In addition to speaking, vocabulary acquisition is paramount, with 92% of students acknowledging its importance. Vocabulary serves as the foundation for all language skills, enabling students to express ideas clearly and comprehend complex materials. According to (Ayiz & Hidayatulloh, 2024), a robust vocabulary facilitates easier learning of English and enhances confidence in interactions with international communities. Moreover, the New General Service List (NGSL) provides a compilation of approximately 2,800 high-frequency words that cover about 92% of general English texts, offering a practical resource for learners aiming to improve their vocabulary efficiently.

In summary, the emphasis on speaking skills and vocabulary development is well-founded, given their critical roles in effective communication within the engineering field. By focusing on these areas, engineering students can better prepare for the linguistic demands of their future professional environments.

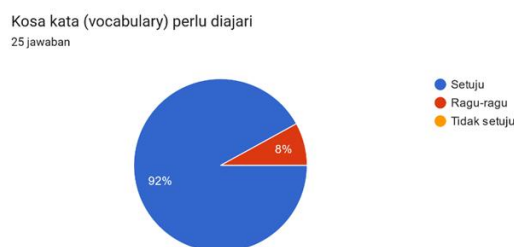


Diagram 2. Vocabulary

The next question was grammar; students agreed (84%) that it was necessary and had to be studied, alongside good vocabulary mastery. Grammar also supports speaking so that it conveys ideas that are easy to understand. Learning grammar is essential for developing good language and communication skills.



Diagram 3. Grammar

Based on the provided data, 80% of students recognize the importance of studying word classes (parts of speech) in mastering English grammar. Understanding word classes is fundamental to constructing grammatically correct sentences and comprehending the overall structure of the language. (Soni & Thakur, 2018) emphasize that a solid grasp of grammatical components, including word classes, is essential for non-native English speakers to effectively read, write, and speak the language.

A student respondent, EF, noted:

"Untuk memahami struktur kalimat itu tidaklah mudah kak, tapi dengan mempelajari kelas kata bisa dijadikan landasan untuk memahaminya kak, dan juga menurut saya untuk menganalisis suatu teks, memahami kelas kata memiliki peran besar."

Furthermore, 88% of students agree that accurate pronunciation is crucial in English communication. Proper pronunciation ensures clarity and prevents misunderstandings, especially when conversing with native speakers. (Kim et al., 2022) highlight the effectiveness of self-supervised learning models in assessing and improving pronunciation among English-as-a-second-language learners, demonstrating advancements in automatic pronunciation assessment techniques.

A teacher respondent, JA, stated:

"Pronunciation siswa sudah cukup baik rata-rata ya berdasarkan kelas yang saya ajarkan, lingkungan memengaruhi dalam berbicara tentunya. Disekolah kita sudah ada English Club jadi mereka wajib berbicara baik ke saya dan teman-teman mereka menggunakan Bahasa Inggris namun peminatnya masih kurang, mungkin karena tidak percaya diri."

b. Lack

The gap between what students already know and what students need to learn is called lack (Hutchinson & Water, 19187). Lack is a gap or space between students' needs and desires in studying English subjects. It is deficiency that teachers or curriculum developers must know before learning is implemented. It goes on to explain the deficiencies or aspects that engineering students wish to cover their deficiencies. The following diagram shows the disadvantages for students.

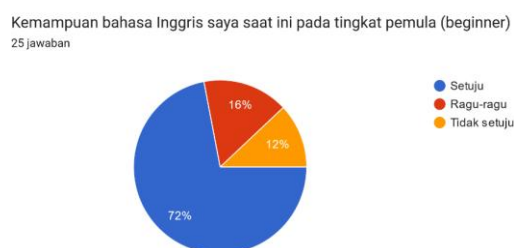


Diagram 6. Student Level

As seen in Diagram 6, initial students assess their English language skills at the beginner level, while they are unsure (16%) and disagree (12%). The level of English proficiency for beginners usually includes a basic understanding of language skills, such as reading, writing, listening and speaking. Beginners usually need to improve in vocabulary and grammar and further guidance to understand and use English well.



Diagram 7. Difficult Skills

Then the language skills they lack mastery are speaking (40%), listening (32%), writing (20%) and reading (8%). Speaking ability is an important aspect of language skills that involves oral expression. This ability has much importance, especially in the context of language learning and communication skills development. However, students feel that their speaking skills still need to improve, especially in conversations when learning occurs.



Diagram 8. Difficulty in Grammar

Diagram 8 explains that their grammar is difficult to learn; as many as (72%) agree with the statement and are unsure (20%), disagree (8%). Many students experience significant difficulties in grammar. Grammar in English, which is not easy, must be learned with lots of practice. Teachers who need help to convey material in a clear and easy-to-understand way can also make it difficult for students to understand and remember grammar rules.

Vocabulary difficulties explained that students agree (56%), which are also difficult to learn, are unsure (32%), and disagree (12%). Students need to practice memorizing and studying vocabulary in English to maintain their understanding of various skills, such as speaking. The following are the student's responses in the interview;

Limited vocabulary has become a major challenge in students' English speaking and writing skills. As expressed by Respondent IB:

"If I knew a lot of vocabulary, it would be easier for me in speaking and writing, but since my vocabulary is limited, it's a bit lacking, miss."

(Kılıç, 2019) emphasizes that having a broad vocabulary significantly contributes to improved speaking and writing skills in English. Therefore, expanding students' vocabulary is an essential step in developing their overall communication abilities.

Pronunciation difficulties are also a barrier for some students. A total of 52% of students agreed that they struggle with pronunciation, 28% were unsure, and 20% disagreed. Respondent TRS shared:

"I'm a bit unsure how to properly pronounce English words, miss. There are words that sometimes have different meanings but sound almost the same, like 'buy' and 'by'. So it's confusing for me to understand them. I have to understand the context and situation to get the meaning right."

(Bakar & Abdullah, 2019) stress the importance of accurate pronunciation in spoken English, as mispronunciations can lead to misunderstandings. Furthermore, (Celce-Murcia et al., 2010) highlight the need for active and physical practice in producing sounds correctly, emphasizing the articulatory approach in teaching pronunciation.

c. Wants

Another term that is often encountered when searching for a need is desire. Want refers to what students want to know (Hutchinson & Waters, 1987). Next, explain what students want to learn in English.

Metode pembelajaran apa yang menarik?
25 jawaban

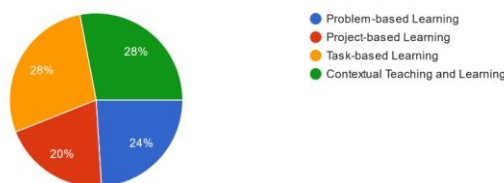


Diagram 11. Learning Methods

Diagram 11 related to learning methods, there are four method choices related to the methods used in the curriculum; students can want which method should be used more often in learning English, Contextual Teaching and Learning and Task-Based Learning have the same percentage, namely 28%, while problem-based learning (24%), and project-based learning (20%).

Kegiatan pembelajaran bahasa Inggris dilaksanakan melalui PPT, media video (film)
25 jawaban

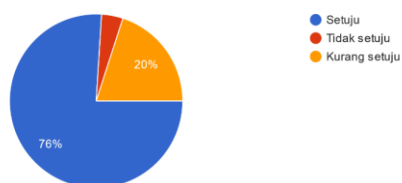


Diagram 12. Activities in Learning Media

Diagram 12 relates to the use of learning media, based on interviews with respondent JA, an English teacher who said that the learning media that have been used are PowerPoint and YouTube videos, but mostly existing textbooks. The results in Diagram 12 show that the importance of using interactive learning media is very necessary, so the percentage of students agreeing (76%) is greater than disagreeing (20%) and disagreeing (3%).

kegiatan pembelajaran di kelas harus penuh dengan aktifitas, kerja kelompok atau berpasangan dan proyek.
25 jawaban

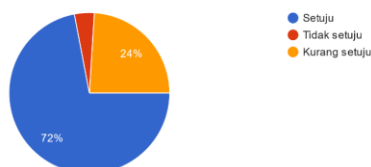


Diagram 13. Learning Activities

Diagram 13 shows that students agree (72%) that fun learning activities must be full of activities. This will motivate students to always be enthusiastic and motivated to participate in learning and not be too rigid about the textbooks they have.

Discussion

a. Necessities

A need that depends on the situation for the person is the student's success in achieving targets. Based on existing findings, in seeking the 'goals' students prioritize in learning English is to improve their quality or develop themselves in preparation for the world of work. (Rosyidi Darmanto, 2020) stated that people's interest and enthusiasm have increased rapidly because English is very important in everyday life. As is known, today's era requires us to be able to communicate using English. So, improving self-quality in English is necessary for engineering students. Diagram 1 shows that students select important language-speaking skills to learn. Fluency in English is important because it will be used to communicate internationally. (Richard, 1990) emphasized that mastering speaking skills is the main priority for second

and foreign-language learners. As a result, students often self-evaluate their success in learning English based on how well they perceive success in spoken English proficiency.

Diagram 2 reveals the importance of speaking components, one of which is vocabulary. Students agree that vocabulary is very important in speaking because the large amount of vocabulary students have can support their speaking skills. This is in accordance with (Isti'anah, 2014), who found that a student will speak well if he has a lot of vocabulary and good grammar knowledge.

Diagrams 3 and 4 explain that grammar and word classes in English also play an important role in forming effective communication. Therefore, every sentence that is spoken always has its own special meaning, so we know that there are different types of sentences, including sentences to ask questions, sentences to provide information or notification sentences, warning sentences, and so on. According to (Mar'at, 2012: 31), "if the listener fails to grasp the functions (for example, a sentence as ordering, ordering, and so on), then he is said to have misunderstood."

English pronunciation is a science that studies techniques/procedures for pronouncing English vocabulary; one of the points that is quite difficult, compared to grammar and vocabulary, pronunciation is very important. According to (Botley, 2017) English pronunciation is important because many sounds and words in English are difficult to pronounce correctly. Having good pronunciation can make our communication with the person we are talking to or native speakers easier to understand. Diagram 5 explains that students need to be taught good and correct pronunciation; even though English is a foreign language, they have the motivation to learn so that what they convey is clear.

b. Lacks

Apart from looking for needs, identifying deficiencies is important to determine what students do not need to learn. Based on the 'deficiency' results, respondents were given five questions. The first question is to find out about the student's level of proficiency. Diagram 6 shows that the student's level of language ability is in the "beginner" category. Students still need to improve their English skills to an advanced level. They remember that English is a competitive advantage for vocational school graduates to get better jobs.

Then, Diagram 7 explains that speaking skills are the most difficult to learn. Students are required to develop the ability to speak in each component. Diagrams 8 and 9 show students' perceptions of the difficulty of their grammar and vocabulary choices, meaning students can improve their ability to understand reading texts and articles in English. (Rosyidi Darmanto, 2020) stated that to understand texts easily, Indonesian students must master several English vocabulary items. Many high school/MA graduates need help understanding the text. This is due to the need for more vocabulary items, knowledge, grammar, and other language components. Then, students can understand the meaning or listen little by little. This involves understanding the speaker's accent or pronunciation, grammar, vocabulary, and meaning.

Diagram 10 shows students' perceptions of their English pronunciation abilities. All speaking components, one of which is pronunciation, are in the 'most difficult' category, meaning students lack English pronunciation ability. Pronunciation is considered to need attention in speaking learning for engineering students. In line with this, (Aulia, 2002) states that pronunciation is a very important basis in oral communication and the basis for successful communication, as the following student pointed out in the interview.

(RS respondent)

"pada kenyataannya untuk kesulitan yang saya sering dapatkan ketika belajar bahasa Inggris kak adalah penyebutan karena biasanya ada beberapa kata-kata yang hampir sama penyebutannya tapi memiliki arti yang beda"

One respondent answered about the difficulty he often gets in learning English, namely pronunciation. Many words have different meanings but has the same pronunciation, which happens because Indonesian students learn English as a second or foreign language.

c. Wants

Desire is something that students want to learn and master. Knowing what students want to get during English learning is different from determining their desires based on the demands of a "need" situation. In order to find out the 'desires' of engineering students, respondents were asked four questions.

The findings in Diagram 11 show that students' perceptions of the importance of learning methods in English really have a big influence on understanding the material. Task-based learning, the learning method that students want to use when applying English material, is related to everyday life and is a goal-oriented activity that leads to a result.

Of course, teachers can consider these methods to create a more student-centered environment in their classrooms. In assignment-based classes, learning is based on completing the main assignment and its presentation. Diagram 12 shows students' perceptions about the learning media used: PowerPoint and

animated videos sourced from YouTube. The use of interactive PowerPoint can be considered one of the possible alternatives because we cannot deny that currently, teachers' mastery of technology is still inadequate, so an alternative is needed that allows a good learning process to be implemented even with teachers' inadequate technological capabilities. This is the opinion of (Engko, C. & Usmany, P., 2020), who stated that the mastery of technology and information among teaching staff in Indonesia still needs to be improved. Using this interactive media can increase learning motivation, is quite interesting, and is very helpful in understanding learning material.

Diagram 13 explains students' perceptions of fun learning activities, namely group/pair work activities, not individual ones. Thus, students have the opportunity to work together with others and communicate their thoughts. This activity is also important because every idea group members have is discussed to reach a mutual agreement. In the end, cooperative learning can be achieved well because decisions are made based on deliberation.

Diagram 14 shows students' perceptions regarding the desirability of this type of assignment in the form of increasing English vocabulary so that students produce better learning outcomes. Mastering English requires a large vocabulary. A large vocabulary must be based on strong grammar to make it possible for us to understand reading well and vice versa; good grammar with a large vocabulary means that writing can be read perfectly (Yusran Pora, 2001: 1).

4. CONCLUSION

Performing a needs analysis assists students in recognizing their specific needs in English. Here, English is one of the mandatory subjects studied through engineering students, so it cannot be denied that they know what students need to know, what students do not know, what issues students have and what their learning styles are. Target needs consist of needs, lacks, and wants. Based on research results, most of engineering students need to learn English to enhance themselves. Speaking skills are a concern for most engineering students. Mastery of speaking skill is necessary to apply the actual world. Next, students need to master micro-skills, which include vocabulary, grammar and pronunciation, so they can do properly with macro skills, especially speaking. In addition, most of engineering students selected Contextual Teaching and Learning and Task-Based Learning methods, which should be used regularly in English language learning.

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