

Needs Analysis for Developing an ESP Curriculum for IT Students

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Abstract

This study aims to identify the specific English language skills required by students of Information Technology (IT) and assess the adequacy of current English instruction in meeting these needs. The research investigates students' perceptions of the importance of English in IT, their challenges in using English, and their preferred learning methods. A survey was conducted among IT students to gather data on their experiences, difficulties, and expectations regarding English language learning. The results indicate that while students acknowledge the significance of English in their field, they often struggle with understanding technical documentation, writing professional reports, and engaging in verbal communication. They also express a strong preference for more practical, task-based learning approaches, such as interactive discussions, project-based assignments, and specialized English for Specific Purposes (ESP) courses designed for IT contexts. These findings suggest the need for a curriculum that integrates real-world IT communication scenarios, enhances technical vocabulary acquisition, and provides immersive English learning experiences. The study concludes that an improved ESP curriculum should focus on practical application and industry relevance to better prepare students for professional IT environments.

Keywords: *need analysis, ESP, curriculum, information technology*

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INTRODUCTION

In today's digital world, being able to speak and understand English is a very important skill for people working in Information Technology (IT). English is known as the international language and is widely used in many areas of IT, such as reading programming documentation, writing technical texts, working with global teams, and building a professional career. Most programming languages and tools come with instructions and manuals written in English, so IT professionals need good reading skills to understand them. Writing reports, user guides, and academic papers also requires a good level of English (Rifiyanti & Hardianti, 2023). A strong vocabulary helps students or workers express their ideas clearly in both speaking and writing



(Tielman, 2021). Since many IT companies now operate globally, English has become the main language used when communicating with colleagues from other countries.

Programming uses artificial languages, but instructions, documentation, and debugging often require an understanding of English. IT students not only need to understand programming syntax but also technical terms in English used in documentation and professional communication (Raghavender Sharma, 2020). Since programming languages and technical documentation are mostly in English, IT students need to have reading and comprehension skills for technical texts (Rohandi et al., 2023). Moreover, As technology and information continue to progress, informatics is becoming a key part of modern life. In Indonesia, the IT industry is still in the process of growing, which makes English skills even more necessary. Since most programming tools, software, and IT references from around the world are written in English, being able to understand the language is crucial. Indonesian IT students and professionals need English not only to access global resources but also to stay in line with international developments. With strong English skills, they can better communicate across borders, comprehend complex technical content, and take part in the global IT field. Moreover, mastering English enables IT professionals to work effectively in the global market (Musyaffa, 2021). English is a key language in the Information Technology sector, used widely for programming, reading documentation, and troubleshooting code. Studies indicate that IT students must build strong technical English skills to understand core programming concepts and communicate clearly in professional environments. As technological development continues, particularly in countries like Indonesia, proficiency in English allows individuals to access international resources, work with global teams, and improve their career prospects in the fast-changing digital industry (Rifiyanti et al., 2023).

To implement the importance of English in the IT field, the English for Specific Purposes (ESP) for IT Students curriculum must be specifically designed with a focus on the skills required in the professional world (Lee & Schmidgall, 2020). The ESP for IT Students curriculum must be carefully designed to address the specific language skills required in professional settings. One example of a book relevant to the ESP for IT Students curriculum is *English for ICT Engineering*. This book is designed for beginner students taking an ESP course in the Information Technology Engineering study program. Its materials are systematically structured to help students develop their English proficiency, creativity, and innovative skills in using the language (Kustini, 2021). In programming, comments within the code provide explanations and clarify functionality, making it easier for developers to understand complex logic. Since most programming languages and open-source projects use English for comments, IT students must develop strong reading skills to comprehend them effectively. Understanding these comments helps in debugging, modifying, and collaborating on projects, especially in global development teams.

Unlike general English courses, this curriculum should focus on technical reading and writing, professional communication, and collaboration in global IT environments. IT students need to develop the ability to understand programming documentation, write clear and concise technical reports, and communicate effectively in international teams (Potter et al., 2022).



Additionally, they must be familiar with industry-specific terminologies, coding-related discussions, and the ability to present their ideas in English. By designing the curriculum to these needs, students will be better prepared to navigate the global IT landscape, access international job opportunities, and contribute effectively in a technology-driven world.

Error messages play a crucial role in identifying and fixing issues within a program. Since most programming environments generate errors in English (Zhou et al., 2021). IT students must be able to interpret these messages accurately to troubleshoot problems efficiently. Besides, writing clear debugging reports in English is essential for communicating issues and solutions with fellow developers, particularly in international teams. Strong analytical and writing skills in English enable IT professionals to work more effectively in a globally connected industry.

Research has shown that the importance of English proficiency in the IT industry and offers recommendations to overcome communication barriers. By improving their language skills, IT professionals can collaborate more effectively, contribute to global projects, and boost success. The findings benefit IT workers, educators, and businesses seeking to enhance communication in the evolving tech industry (Garcia et al., 2024). Global IT companies demand employees who can communicate clearly in English to collaborate effectively in international teams. Despite this, many universities still lack a structured ESP curriculum for IT students, leaving a gap between academic learning and industry needs (Kováčiková, 2020). A major challenge for IT students is the lack of a specialized ESP curriculum tailored to their field. Traditional English courses primarily focus on general language skills, such as grammar, basic conversation, and essay writing, which do not fully equip students with the specialized vocabulary and communication strategies required in the IT industry.

As a result, many IT students struggle with understanding technical documentation, composing professional emails, and communicating effectively in workplace settings. This gap between general English instruction and industry-specific language needs highlights the necessity of a well-structured ESP curriculum for IT students. A specialized program should focus on reading and interpreting technical texts, writing precise and professional emails, delivering technical presentations, and participating in collaborative discussions. By integrating task-based learning and real-world materials—such as software documentation, API references, and open-source projects—universities can bridge this gap and better prepare IT students for global career opportunities.

An effective ESP curriculum for IT ensures that students develop both their programming skills and their ability to communicate clearly in professional environments. With a strong foundation in technical English, IT graduates will be more competitive and better equipped to navigate the fast-evolving field of information technology. This research focuses on identifying the specific English skills that IT students need. It aims to develop an English course designed to fit their particular study and work requirements, such as understanding programming, reading technical documents, and communicating with international teams. Unlike general English classes, this study highlights the needs of IT students in Indonesia.



Since the IT sector is growing but many students face challenges with English, this research helps design a better course that prepares them effectively for their future careers.

METHOD

This study employs a descriptive quantitative approach to analyze the English language needs of IT students for developing an English for Specific Purposes (ESP) curriculum. The research was done with 27 IT students from two private universities that have strong IT programs: Institut Bisnis dan Informatika Kosgoro 1957 and Institut Bisnis dan Informatika Kwik Kian Gie as the primary source of data. A survey method is used to collect quantitative data systematically and objectively. The study utilizes a structured questionnaire consisting of multiple-choice questions to assess students' English proficiency levels, learning preferences, and challenges in IT-related contexts. The questionnaire is divided into several sections: Background Information, includes questions about students' educational level and prior experience with English, English Proficiency, and Usage to assesses students' confidence and frequency in using English for academic and professional purposes, Learning preferences—identifies students' preferred learning methods, materials, and activities for ESP, challenges in Learning English for IT—explores difficulties faced by students when learning English in their field. The questionnaire is distributed both online (via Google Forms) and offline (printed copies) to ensure wider participation and accessibility for students from both campuses. The collected data will analyzed using descriptive statistical methods, including frequency distribution, percentages, and mean scores, to identify common trends in students' responses. The results are interpreted to gain insights into students' specific English language needs, which will serve as the foundation for designing an effective ESP curriculum tailored to IT students. By employing this descriptive quantitative survey approach, the study ensures a structured and objective analysis of students' needs, providing valuable recommendations for curriculum development.

FINDINGS AND DISCUSSION

The findings of this study are based on the analysis of questionnaire responses collected from 27 IT students at Institut Bisnis dan Informatika Kosgoro 1957 (IBIK 57) and Institut Bisnis dan Informatika Kwik Kian Gie (IBI KKG). The results provide insights into students' English language proficiency, learning preferences, and challenges in English for Specific Purposes (ESP) for IT. Data analysis was conducted using descriptive statistics, including frequency distribution, percentages, and mean scores, to identify key trends. The findings are organized into four main categories: students' background information, English proficiency and usage, learning preferences, and challenges in learning ESP for IT. Each category is examined in detail to highlight the specific language needs of IT students, serving as a foundation for developing an effective ESP curriculum.

General Information

The questionnaire was completed by 27 students. Among them, 77.8% were male respondents, while the remaining 22.2% were female. In terms of academic level, 74.1% of



respondents were first- or second-semester students, 14.8% were in their fifth or sixth semester, and the remaining respondents were from the third or fourth semester. In response to the question, "How often do you use English in IT lectures?", the survey results showed the following distribution:

Seberapa sering Anda menggunakan bahasa Inggris dalam perkuliahan IT?
27 jawaban

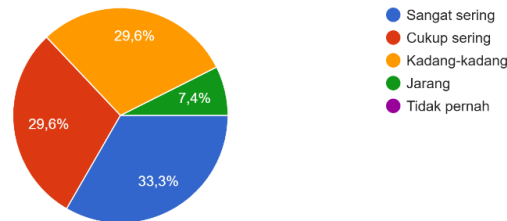


Figure 1. Frequency of English Usage in IT Lectures Among Students

The data indicates that most students use English in their IT lectures to some extent, with over 60% using it frequently (very often or often). However, nearly 30% only use it occasionally, and a small portion never use it. This suggests that while English plays a significant role in IT education, there is still a gap in consistent usage among students.

English Proficiency in IT

In response to the question, "How well do you understand technical documentation in English?", the survey results showed the following distribution:

Bagaimana tingkat pemahaman Anda terhadap dokumentasi teknis dalam bahasa Inggris?
27 jawaban

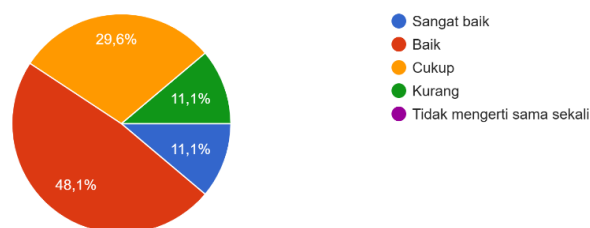


Figure 2. Students' Understanding of Technical Documentation in English"

The data suggests that most students have a good or fair understanding of technical documentation in English, with nearly 80% demonstrating at least a moderate level of comprehension. However, a small percentage have excellent proficiency, while a few still struggle with understanding technical content in English. This highlights the need for further support in improving English skills related to technical documentation. Meanwhile, From the question "Which aspects of English are the most difficult in the IT field?", the survey results



indicate that the most challenging areas for students are understanding technical IT terms and writing project reports or documentation. Many students also struggle with communicating in English within an IT team and understanding video tutorials or IT courses in English. However, reading technical documentation is considered less challenging but still presents difficulties for some students. These findings suggest that students need more support in technical vocabulary, writing skills, and communication in professional IT settings to enhance their English proficiency in the field.

From the question "How do you usually understand technical terms in English?", the survey results show that the majority of students (66.7%) rely on dictionaries or Google Translate to find meanings. Meanwhile, 11.1% ask their friends or lecturers, and 22.2% learn directly from the context.

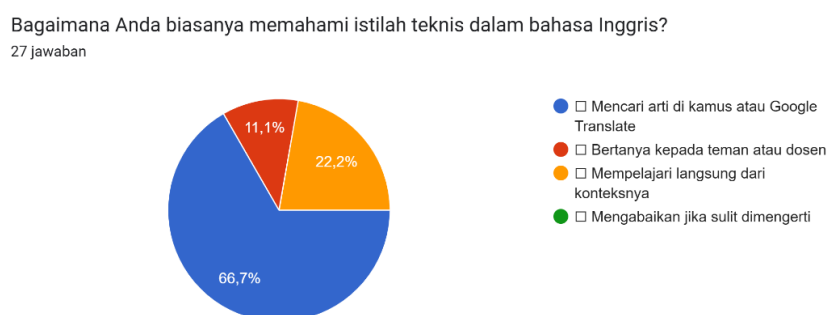


Figure 3. Methods for Understanding Technical Terms in English

These findings suggest that most students depend on translation tools rather than contextual learning or discussion with peers and lecturers. Encouraging more engagement with context and discussions could help improve their ability to understand technical terms more effectively.

English proficiency in IT has both benefits and challenges. On the positive side, it helps students access more learning resources, such as research papers, documentation, and online courses. It also improves career opportunities, as many IT companies require good English skills. Learning through context and discussions helps students understand technical concepts better, while strong communication skills allow them to collaborate in global teams. However, there are also challenges. Many students rely too much on translation tools, which can prevent them from fully understanding technical terms. Poor English skills can make communication in IT teams difficult, affecting teamwork and project success. Students who struggle with English may also feel less confident in discussions, presentations, and writing. Additionally, difficulty in understanding English technical content may limit their ability to learn and keep up with new developments in IT. Overall, while English is important for IT education and careers, students need better support in technical vocabulary, writing, and communication. Encouraging contextual learning, discussions, and real-world practice can help them overcome these challenges and succeed in the IT field.

Based on the survey results, IT students face challenges in understanding technical terminology, writing documentation, and communicating in teams. Many rely heavily on translation tools instead of learning from context, which can hinder their ability to use English effectively in professional settings. To address these issues, the ESP curriculum should focus on practical English skills tailored to IT needs. The course should emphasize strategies for understanding technical terms without translation tools by encouraging contextual learning and direct exposure to English materials such as IT blogs, forums, and API documentation. Reading exercises should involve real IT documentation, helping students identify common patterns in technical texts and simplify complex descriptions for better clarity. Writing skills should be developed through structured practice in project documentation, including user guides, bug reports, and professional emails, with peer review activities to improve clarity and accuracy. To enhance communication skills, students should engage in role-playing IT workplace scenarios, learning proper email and chat etiquette while practicing technical discussions and presentations. Since understanding video tutorials and IT courses is also a challenge, listening exercises should focus on note-taking, handling different accents, and understanding fast speech in IT-related podcasts and webinars.

Task-Based Learning (TBL) is a highly effective approach for developing English proficiency in IT students, as it emphasizes authentic language use, skill-based learning, and active student engagement. By incorporating real-world IT tasks such as writing documentation, collaborating in teams, and using professional tools like Slack, Jira, or Trello, students gain practical communication skills relevant to their field (Sholeh et al., 2020). To apply Task-Based Learning (TBL) in ESP for IT students, instructors can use real IT tasks and teamwork to make learning practical. Students should practice writing bug reports, emails, and project documentation in English while collaborating on problem-solving activities (Fortuna et al., 2024). Group projects help students improve both technical and language skills, while reading IT documentation and watching tutorials enhance their vocabulary and comprehension (Tini Moge, 2023). To make learning easier, instructors can provide step-by-step guidance, templates, and examples. Peer feedback also helps students refine their work and gain confidence in using English.

The results highlight the specific language challenges IT students face, such as understanding technical terms, writing documentation, and effective communication. These findings emphasize the need for an ESP curriculum that integrates task-based learning, real-world IT scenarios, and collaborative projects to enhance their practical English skills. This aligns with the study's objective of designing a curriculum that meets students' professional and academic needs. To effectively implement ESP based on Task-Based Learning (TBL) for IT students, instructors should use authentic materials from the IT field, such as software documentation, API references, bug reports, and professional emails (Rica & Cubillo, 2009). Meanwhile, a project-based approach can enhance learning by assigning real-world tasks, such as writing user manuals, troubleshooting guides, or simulating IT team discussions (Kristianti, 2023). Assessments should focus on clarity, completeness, and language accuracy to ensure students develop practical communication skills (Diem, 2018). Collaboration is also key, with



peer review activities where students provide constructive feedback on each other's work and small group discussions to complete reports or projects together (Swamy, 2022). Instructors should emphasize both written and spoken communication skills by engaging students in presentations, role-plays, and simulated IT meetings. Providing structured templates for different IT documents, such as bug reports and user manuals, can help students organize their ideas effectively (Kuppuswamy & Mhakure, 2020). Additionally, performance-based assessments should be used alongside traditional tests, evaluating students based on their ability to write technical reports, deliver technical presentations, and participate in team discussions (Hidayat et al., 2023). By integrating real-world materials, collaborative projects, structured guidance, and task-based assessments, this approach ensures that IT students not only improve their English proficiency but also develop the communication skills needed in the IT industry.

The study shows that IT students need to learn English in a way that focuses on the specific language skills they use in their field. They should practice speaking and writing about technical topics, using real work situations to help them understand better. Working together in groups and giving feedback to each other can also help them improve. Teachers play an important role by guiding students and giving helpful advice during the learning process. This kind of learning makes students ready to use English well in their future IT jobs. The research suggests that English lessons should not only teach general language but also focus on skills needed for IT work, like writing reports and making presentations. Using real examples and group projects helps students learn better and get used to working with others, just like in real IT teams. It is also important for students to learn on their own and think critically so they can keep improving. Teachers need to support this by giving clear feedback and helping students practice both speaking and writing. Overall, this approach helps students prepare well for the language demands they will face in their IT careers.

English Learning in IT

From the question "How important do you think English is in the IT field?", the survey results show that 85.2% of respondents consider it very important, while the rest see it as moderately important. Notably, no respondents rated English as less important or not important at all.



Figure 4. The Importance of English in the IT Field



These findings highlight the essential role of English in IT, especially for accessing global resources, understanding technical documentation, and communicating in an international work environment. This underscores the need for ESP courses that emphasize practical IT-related English skills, ensuring students are well-equipped for their future careers. Meanwhile, From the question "Do you feel that the English learning you received in college is sufficient for IT needs?", the results show that only 11.1% of respondents believe it is fully sufficient. Meanwhile, 74.1% feel it is somewhat sufficient but requires more practice, and 14.8% think it is insufficient and need more IT-related materials. Notably, no respondents rated it as completely insufficient.

Apakah Anda merasa pembelajaran bahasa Inggris yang telah Anda terima di perkuliahan cukup untuk kebutuhan di bidang IT?
27 jawaban

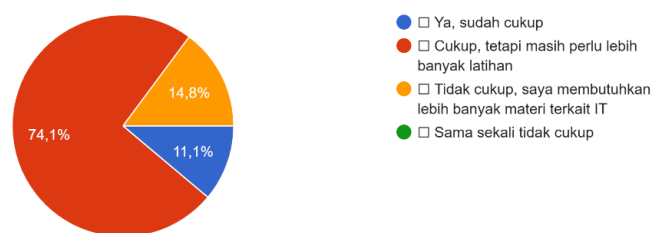


Figure 5. Sufficiency of English Learning for IT Needs

These findings suggest that while the current ESP curriculum provides a foundation, there is a clear need for more practical exercises and IT-specific English content to better prepare students for real-world applications in the IT industry.

However, from the question "What materials do you think should be included in English learning for IT students?", the responses indicate that reading and understanding technical documentation is the most needed skill, followed by writing technical reports and professional emails and presenting and discussing projects in English. Additionally, students also see value in job interview simulations for IT positions and practicing comprehension of IT-related video tutorials. These findings suggest that students require more practical, industry-specific English training. To better prepare them for professional settings, the ESP curriculum should focus on real-world IT communication tasks, ensuring they develop the necessary skills for success in the field.



Materi apa yang menurut Anda perlu dimasukkan dalam pembelajaran bahasa Inggris untuk mahasiswa IT? (Boleh memilih lebih dari satu)

27 jawaban

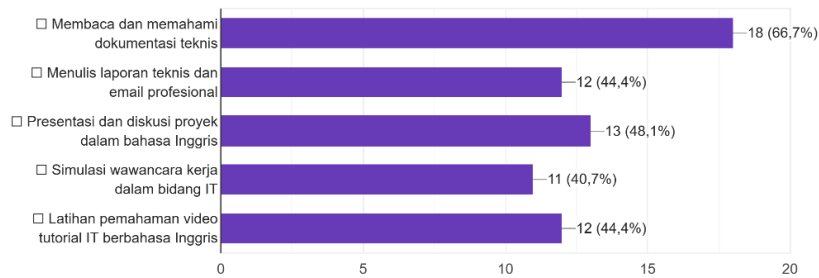


Figure 6. Recommended English Learning Materials for IT Students

These findings can be considered part of a needs analysis for developing an ESP curriculum for IT students. Needs analysis in ESP focuses on identifying the specific language skills and competencies that students require to function effectively in their professional domain. The students' responses indicate a clear demand for practical, IT-specific English training, particularly in reading technical documentation, writing reports and emails, presenting projects, preparing for job interviews, and understanding IT-related videos. These insights can guide curriculum development by ensuring that the course content aligns with real-world communication needs in the IT industry. By incorporating these elements into the ESP curriculum, institutions can better equip students with the necessary English skills for their future careers.

From the question "What do you think is the best way to improve English skills in the IT field?", the responses reveal students' expectations for more IT-specific English learning opportunities. The majority believe that integrating more IT-related English materials into coursework (40.7%) and providing a dedicated ESP course for IT students (44.4%) would be the most effective solutions. Additionally, some students suggest workshops or seminars in English related to IT (11.1%), while others emphasize the need for more tasks and projects in English.

Menurut Anda, bagaimana cara terbaik untuk meningkatkan kemampuan bahasa Inggris dalam bidang IT?

27 jawaban

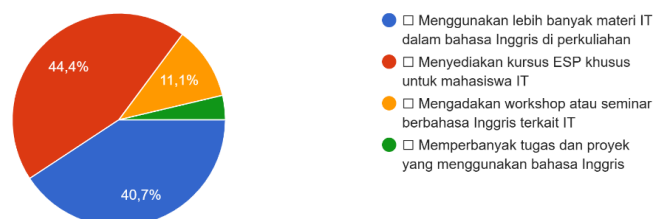


Figure 7. Students' Perspectives on Improving English Skills in IT

These responses reflect a clear expectation for a more structured and immersive English learning experience that aligns with real-world IT applications. Students recognize that exposure to authentic IT materials, hands-on practice, and specialized courses can significantly enhance their English proficiency. From a curriculum development perspective, these insights suggest that institutions should consider offering a dedicated ESP course for IT students, incorporating more IT-related reading and writing tasks, and organizing workshops or projects that simulate real IT workplace scenarios. This approach would ensure that students develop not only technical skills but also strong English communication abilities, preparing them for global career opportunities in the IT industry.

The survey shows that English is very important for IT students, but many feel their current English classes don't fully prepare them for their professional needs, like reading technical texts, writing reports, presenting projects, and understanding IT videos. Students suggest adding more IT-related English materials, offering a special ESP course, and including practical activities like projects and workshops. They want English learning to be part of their core IT subjects through tasks like reading, writing, and presentations. The ESP course should focus on industry vocabulary, document analysis, and workplace practice using real IT examples. Students also need more practice with speaking, presentations, and interviews, supported by extra workshops and interactive exercises. Creating an environment where students regularly use English in IT discussions and encouraging self-study with digital tools will help improve their skills.

Overall, the findings show the need for a well-designed ESP program that combines theory and real-world practice to prepare IT students for their future careers. This study helps us understand what kind of English IT students need to learn so we can make a better English course just for them. By using a survey, we collected clear and organized information about how good students are at English, what ways they like to learn, and what problems they have when using English in their IT studies. First, the results show that students have different levels of English skills. Some feel confident using English in their classes and IT work, but others still find it hard. This means the English course should have materials and activities that fit different skill levels, so all students can improve and feel comfortable. It's also important to keep helping students with English while they learn technical IT subjects. Next, students prefer learning by doing things that relate to real IT work. They like tasks that involve solving problems, studying real examples from IT, and using real IT materials. This matches well with the idea of English for Specific Purposes (ESP), which uses topics that relate to the students' future jobs. Therefore, using these kinds of activities in the course will make students more interested and motivated to learn.

The study also found that many students struggle with some parts of learning English. For example, they find it hard to understand technical words, use grammar correctly in real situations, and speak English confidently. Because of this, the course should not only teach grammar and vocabulary but also focus on how to use English in IT settings, like discussions, presentations, and writing reports. This will help students communicate better in their future careers. However, the survey was given both online and on paper, so more students could take



part. This is important because different students have different ways of accessing the survey. It also reminds us that the English course should offer flexible ways to learn, especially with technology becoming more common. In summary, this study gives us clear information about what IT students need to learn in English. Using this information, teachers and course designers can create a course that fits students' skill levels, interests, and challenges. This will help students not only improve their English but also get ready to use it in the IT world. Finally, for future research, it would be helpful to talk directly with students to understand more about their experiences. This can help make the course even better.

CONCLUSION

This study clearly highlights the crucial role that English proficiency plays in the IT field, as all participating students acknowledged the importance of English for their academic and future professional success. Despite this recognition, many students expressed that their current English education does not adequately prepare them for the specific language demands they face in IT-related tasks such as reading technical documents, writing reports, presenting projects, and understanding video tutorials. Therefore, it is strongly recommended that a specialized English for Specific Purposes (ESP) curriculum be developed, tailored specifically to the needs of IT students. This curriculum should emphasize industry-relevant vocabulary, technical reading and writing skills, and effective professional communication. Integrating English learning directly into core IT subjects is essential, allowing students to practice language skills through technical assignments, real-world problem-solving, and communication activities like project presentations and technical discussions. In addition, active learning strategies such as hands-on projects, case studies, workshops, and peer collaboration will enhance engagement and deepen understanding. Supplementary support in the form of workshops, seminars, and online resources should also be offered to help students improve their skills beyond regular coursework. Encouraging an English-rich learning environment where students frequently use English in IT-related discussions can further enhance their confidence and fluency.

However, this study has certain limitations that should be considered when interpreting the findings. The sample size was relatively small, involving only 27 students from two private universities, which limits the generalizability of the results to other institutions or larger populations. Additionally, the reliance on self-reported questionnaire data means that responses may be affected by students' personal perceptions and biases. The study also focused mainly on quantitative data, which might not capture deeper insights into students' experiences or attitudes toward English learning. Future research could overcome these limitations by including a larger and more diverse group of students, incorporating qualitative methods such as interviews or focus groups, and exploring longitudinal data to assess the impact of implemented ESP programs over time. Despite these limitations, the study provides valuable practical recommendations for developing an effective ESP curriculum that aligns with the real-world needs of IT students, thereby helping them succeed in the global technology industry.



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