p-ISSN: 2963-7856| e-ISSN: 2961-9890
Available online at jerkin.org/index.php/jerkin
Jurnal Pengabdian Masyarakat dan Riset Pendidikan
Volume 4 No. 4 April-June 2026, 27434-27442

Need Analysis on English for Specific Purposes of Computer Network Engineering Students at SMK Swasta YPK Medan

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https://doi.org/10.31004/jerkin.v4i4.6938

ARTICLE INFO

Article history
Received: 09 May 2026
Revised:24 May 2026
Accepted: 17 June 2026

Kata Kunci:
Komunikasi Persuasif, Dakwah Digital, Retorika TikTok

Keywords:
Persuasive Communication, Digital Preaching, TikTok Rhetoric

ABSTRACT

Penelitian ini bertujuan mengidentifikasi kebutuhan bahasa Inggris siswa Jurusan Teknik Jaringan Komputer di SMK Swasta YPK Medan. Penelitian menggunakan desain deskriptif campuran dengan subjek 10 siswa. Data dikumpulkan melalui kuesioner Google Form yang memuat skala Likert, pilihan ganda, kotak centang, dan pertanyaan terbuka. Data kuantitatif dianalisis secara deskriptif menggunakan persentase dan frekuensi, sedangkan data kualitatif dianalisis dengan model interaktif Miles dan Huberman (1994). Analisis kebutuhan mengacu pada kerangka Hutchinson dan Waters (1987), meliputi Analisis Situasi Target, Situasi Saat Ini, dan Situasi Pembelajaran. Hasil penelitian menunjukkan bahwa siswa memandang bahasa Inggris penting untuk karier, terutama dalam memahami istilah komputer, mengoperasikan perangkat lunak berbahasa Inggris, dan menulis laporan teknis. Namun, kemampuan mereka masih pada tingkat dasar hingga menengah, dengan keterampilan menulis dan berbicara sebagai kelemahan utama. Kurikulum yang ada masih bersifat umum dan kurang mengintegrasikan materi komputer dan jaringan. Meski demikian, siswa memiliki motivasi tinggi dan lebih menyukai pembelajaran praktik yang didukung teknologi AI dan aplikasi bahasa. Temuan ini menunjukkan perlunya pengembangan pembelajaran bahasa Inggris berbasis ESP yang menekankan kosakata bidang komputer, keterampilan membaca dan menulis teknis, serta pemanfaatan teknologi dalam proses pembelajaran.

This study aims to identify the English language needs of Computer Network Engineering students at YPK Medan Private Vocational High School. The study used a mixed descriptive design with 10 students as subjects. Data were collected through a Google Form questionnaire containing Likert scales, multiple-choice questions, checkboxes, and open-ended questions. Quantitative data were analyzed descriptively using percentages and frequencies, while qualitative data were analyzed using the interactive model of Miles and Huberman (1994). The needs analysis refers to the framework of Hutchinson and Waters (1987), including Target Situation Analysis, Current Situation Analysis, and Learning Situation Analysis. The results show that students perceive English as important for careers, especially in understanding computer terms, operating English-language software, and writing technical reports. However, their proficiency is still at the elementary to intermediate level, with writing and speaking skills as the main weaknesses. The existing curriculum is still general and lacks integration of computer and network materials. Nevertheless, students are highly motivated and prefer practical learning supported by AI technology and language applications. These findings indicate the need for the development of ESP-based English learning that emphasizes computer vocabulary, technical reading and writing skills, and the use of technology in the learning process.

How to Cite: Bahagia Saragih, et al (2026). Need Analysis on English for Specific Purposes of Computer Network Engineering Students at SMK Swasta YPK Medan, 4(4) 27434-27442. https://doi.org/10.31004/jerkin.v4i4.6938

INTRODUCTION

According to the Indonesian Ministry of Education and Culture's Regulation No. 60 of 2014, vocational institutions are mandated to prioritize the cultivation of expertise within specialized disciplines (Kementerian Pendidikan dan Kebudayaan, 2014). The primary objective for vocational students is to achieve professional readiness within their specific majors, and upon graduation, they are expected to demonstrate high levels of practical proficiency. Consequently, English instruction in vocational settings should be tailored to align with these occupational paths rather than follow a general language curriculum. In practice, however, a gap remains as many students continue to receive English instruction focused on general language skills rather than the industry-specific communication competencies their fields require (Sari & Wirza, 2021).

Widodo (2016) and Yen Dang (2021) suggest that instructional design in vocational contexts should prioritize English for Specific Purposes (ESP) programming. Vogt and Kantelinen (2013) and Marcu (2020) further argue that ESP curricula are specifically structured to address the communicative requirements of learners within professional or academic environments. As noted by Basturkmen (2010), ESP courses maintain a more concentrated scope than general English Language Teaching because they are rooted in a precise analysis of student needs, prioritizing the immediate professional demands of the learner over broader general linguistic goals. For students majoring in Computer Network Engineering, this distinction is especially significant, as much of the technical content in their field is predominantly produced in English (Nurhasanah & Kurniawan, 2023).

Despite this clear occupational relevance, English instruction in many Indonesian vocational schools continues to follow a general English curriculum that does not adequately address the specific language needs of students in technical programs. Nurhasanah and Kurniawan (2023) confirm that English lessons in vocational schools still follow the same approach as general high schools, which does not support students' needs in their specific major, resulting in gaps in English skills among vocational students. In the specific context of Medan, the conceptual and practical frameworks of English instruction remain largely indistinguishable from those found in general senior high schools, leaving Computer Network Engineering students without the specialized language training they require to support their future professional careers. While the investigation of learner needs is a well-established practice in English language pedagogy, many existing studies fail to integrate the specific teaching methodologies and learning preferences of the students themselves (Akyel & Ozek, 2010; Liu et al., 2021), and studies specifically addressing the English language needs of Computer Network Engineering students at the secondary vocational level in Medan remain scarce.

This study therefore aims to identify the English language needs of Computer Network Engineering students at SMK Swasta YPK Medan. The study draws on the needs analysis framework proposed by Hutchinson and Waters (1987), which examines students' needs through three interconnected dimensions: Target Situation Analysis (TSA), Present Situation Analysis (PSA) and Learning Situation Analysis (LSA). Through this framework, the study seeks to answer the following research question: what are the English language needs of Computer Network Engineering students at SMK Swasta YPK Medan?

METHOD

This study employed a descriptive mixed method research design. Creswell (2014) explains that a mixed method approach combines both quantitative and qualitative data collection and analysis to provide a more comprehensive understanding of a research problem. A descriptive design was applied as the study aimed to describe the English language needs of Computer Network Engineering students at SMK Swasta YPK Medan as they naturally exist, without manipulation or experimental intervention (Fraenkel et al., 2012).

The subjects of this study were 10 Computer Network Engineering students at SMK Swasta YPK Medan. The instrument used in this study was an open-ended questionnaire distributed through Google Form via WhatsApp. The questionnaire was designed based on the needs analysis framework proposed

by Hutchinson and Waters (1987), consisting of three analytical dimensions: Target Situation Analysis (TSA), Present Situation Analysis (PSA), and Learning Situation Analysis (LSA). TSA was applied to determine the specific English competencies important for students' future professional careers. PSA evaluated their current English proficiency levels and the relevance of existing instructional materials. LSA examined their preferred pedagogical styles, instructional media, and classroom environments. The questionnaire featured a range of response formats including Likert-scale items, multiple choice questions, checkbox options, and open-ended questions to facilitate the collection of a comprehensive dataset (Dornyei, 2007).

Table 1. The Research Framework Guided the Design of the Student Questionnaire

Dimension	Objectives	Response Formats
Personal Information	To know the targeted respondents' personal information	1 Open-ended question (for name) 1 Likert-scale (for gender)
Target Situation Analysis	To know why they are learning the specific English	2 Multiple choices 1 Likert-scale 1 Checkbox
Present Situation Analysis	To know what level of English they are currently in	7 Likert-scales 2 Checkboxes 1 Open-ended question
Learning Needs Analysis	To know how they want to be taught English (especially aligned with their specific occupational needs)	2 Multiple choices 1 Likert Scale 1 Checkbox 1 Open-ended question

The data were analyzed using a mixed method analysis approach. Quantitative data from the Likert-scale, multiple choice, and checkbox items were analyzed using descriptive statistics in the form of percentages and frequency counts to identify dominant response patterns across each dimension (Sugiyono, 2019). Qualitative data from the open-ended questions were analyzed using the interactive model of Miles and Huberman (1994), consisting of data reduction, data display, and conclusion drawing, to identify themes and patterns in students' expressed needs. The findings from both data types were then integrated and interpreted to provide a comprehensive picture of students' English language needs across the three dimensions of the Hutchinson and Waters (1987) framework.

RESULTS AND DISCUSSION

This section presents the findings of the study based on data collected from 10 Computer Network Engineering students at SMK Swasta YPK Medan through a questionnaire distributed via Google Form. The findings are organized according to the three dimensions of the needs analysis framework proposed by Hutchinson and Waters (1987): Target Situation Analysis, Present Situation Analysis, and Learning Situation Analysis.

Target Situation Analysis

Hutchinson and Waters (1987) define Target Situation Analysis as an examination of what learners need to do with English in their future professional or academic context. The TSA findings show that students clearly expect to use English frequently in their future jobs. Most respondents rated English frequency at level 4 (often) or level 5 (very often), producing a mean score of 4.4 out of 5.0. Only one student selected level 3 (sometimes). This result shows that students are well aware English will be a regular part of working in the computer and network engineering field.

Table 2. Perceived Frequency of English Use in Computer and Network Engineering Jobs

Frequency Level	Frequency	Percentage
3 — Sometimes	1	10%
4 — Often	4	40%
5 — Very Often	5	50%

ISSN 2963-7856 (print), ISSN 2961-9890 (online)

Mean Score	**4.4 / 5.0**

When asked which tasks would require English at work, students identified a wide range of needs. Understanding computer terms and vocabulary was the most commonly selected item, chosen by 8 out of 10 students (80%). Using English-language software and writing reports or messages about computer problems were each selected by 5 students (50%). Reading software or network installation tutorials and understanding computer error messages were each cited by 4 students (40%). Watching English technology tutorials and reading IT forums online were each mentioned by 2 students (20%).

Table 3. Expected English Use Cases in Computer and Network Engineering Jobs

Use Case	No. of Students	Percentage
Understanding computer terms / vocabulary	8	80%
Using English-language software	5	50%
Writing reports / messages about computer issues	5	50%
Reading software / network installation tutorials	4	40%
Understanding computer error messages	4	40%
Watching English technology video tutorials	2	20%
Reading IT discussion forums online	2	20%

These findings show that students need English mainly for reading technical content and written communication. Their target job roles all involve working with English-medium software, documentation, and error messages on a daily basis. The TSA results therefore point clearly to the need for English instruction that focuses on technical vocabulary, reading comprehension, and writing in a computer and network engineering context.

Present Situation Analysis

Hutchinson and Waters (1987) define Present Situation Analysis as an identification of students' current English proficiency, their strengths and weaknesses, and the gap between where they are and where they need to be. The PSA findings show a clear gap between what students need and what they can currently do in English. Across six skill indicators rated on a scale of 1 to 5, the overall mean score was 3.05 out of 5.0, placing students at a basic-to-intermediate level, able to understand some English content, but not yet ready to communicate effectively in a professional setting.

Table 4. Students' Self-Assessment of English Skills

Skill Indicator	Mean Score	Level
Understanding computer vocabulary and terminology	3.60	Moderate
Understanding English computer video tutorials	3.40	Moderate
Understanding English texts about computers	3.40	Moderate
Perceived sufficiency for workplace needs	3.10	Moderate
Writing simple sentences in English	2.60	Low-Moderate
Explaining computer topics confidently in English	2.60	Low-Moderate
Overall PSA Mean	**3.05 / 5.0**	**Basic–Intermediate**

Writing ability and speaking confidence received the lowest scores, both at 2.60 out of 5.0. This is a critical finding because the TSA identified writing reports and messages as one of the top workplace needs, selected by 50% of students. Students are weakest in exactly the skill they will need most. Speaking confidence is equally low, which matters particularly for roles like IT Support and Network Administrator where explaining technical issues to users or clients is a common task.

The difficulties students reported are consistent with these low scores. Pronunciation was the most common challenge, cited by 7 out of 10 students (70%). Grammar usage and vocabulary retention were each reported by 5 students (50%).

Table 5. Main English Difficulties Reported by Students

Difficulty Area	No. of Students	Percentage
Pronunciation	7	70%
Grammar Usage	5	50%

Memorizing Vocabulary	5	50%

It is also worth noting that 9 out of 10 students had already completed a workplace internship meaning their self-assessments reflect real professional experience rather than classroom assumptions alone. Regarding current classroom content, 7 out of 10 students (70%) reported that their English lessons focus mainly on general conversational English, while only 2 students (20%) reported that their lessons include any computer or network-related English material.

Table 6. Current English Classroom Content

Classroom Content	No. of Students	Percentage
General English / Daily Conversation	7	70%
Reading English Texts	5	50%
Grammar Exercises	3	30%
Computer and Network-related Material	2	20%

Students' open-ended responses further confirm this gap. One respondent noted "memahami kosakata asing atau bahasa komputer yg kebanyakan pake bahasa Inggris", while another stated "kurang memahami bahasa IT". Another respondent pointed to difficulties with technical writing, and one described the challenge of understanding directional computer content, noting "sulit untuk memahami kalimat yang mengarahkan isi bagian dari komputer". These responses collectively reflect a shared difficulty in accessing and understanding English-language technical content relevant to their field, reinforcing the finding that students' current English instruction does not adequately prepare them for the language demands of their vocational context.

Learning Situation Analysis

Hutchinson and Waters (1987) define Learning Situation Analysis as an examination of how students want and prefer to learn English in ways that align with their specific occupational context. Students' motivation to learn English for the computer and network engineering field was high, with a mean score of 4.1 out of 5.0, indicating that students are genuinely motivated to develop their English proficiency for career purposes.

Table 7. Students' Motivation to Learn English for Computer and Network Engineering

Motivation Level	Frequency	Percentage
3 — Moderate	2	20%
4 — High	5	50%
5 — Very High	3	30%
Mean Score	**4.1 / 5.0**	

In terms of preferred learning methods, watching English computer video tutorials and listening to teacher explanations were the most preferred approaches, each selected by 3 out of 10 students (30%), followed by group discussion with peers and following computer tutorial steps in English, each selected by 2 students (20%). Regarding preferred learning style, 9 out of 10 students (90%) expressed a strong preference for hands-on practice-based learning, while only 1 student (10%) preferred theory first followed by practice.

Regarding preferred learning media, AI-based tools such as ChatGPT and AI translators were the top choice, selected by 6 out of 10 students (60%). Language learning applications such as Duolingo and Google Translate were preferred by 5 students (50%), and YouTube video tutorials by 3 students (30%). Modules or textbooks and interactive presentation slides were selected by only 2 students (20%) and 1 student (10%) respectively.

Table 8. Preferred Learning Methods and Media

Preferred Method / Media	No. of Students	Percentage
Hands-on / practice-heavy learning approach	9	90%
AI-based tools (ChatGPT, AI Translator)	6	60%
Language learning apps (Duolingo, Google Translate)	5	50%

ISSN 2963-7856 (print), ISSN 2961-9890 (online)

Watching English computer video tutorials	3	30%
Teacher explanation	3	30%
Modules or textbooks	2	20%
Interactive presentation slides	1	10%

Students' open-ended responses reinforced these preferences directly. One respondent noted "biasanya nonton video tutorial orang luar yang bahas tentang komputer, terus tanya pakai AI", while another suggested "cara belajar dengan bantuan teknologi AI" as the most helpful approach. Others consistently emphasized direct practice. These responses show that students are already independently learning English outside the classroom using digital tools, and they want formal instruction to reflect the same approach. The issue is therefore not a lack of motivation but a clear mismatch between the current classroom experience and both the students' actual needs and their preferred ways of learning.

Discussion

This section discusses the findings of the study in relation to the needs analysis framework proposed by Hutchinson and Waters (1987) and relevant previous studies. The discussion is organized according to the three dimensions of Target Situation Analysis, Present Situation Analysis, and Learning Situation Analysis.

Target Situation Analysis

The TSA findings reveal that students hold a strong awareness of English as a frequent and necessary tool in their future professional lives, reflected in a mean score of 4.4 out of 5.0 for perceived English use frequency. This is consistent with Hutchinson and Waters' (1987) argument that target needs are shaped by the professional demands of the learner's future situation rather than their current classroom experience. Nurhasanah and Kurniawan (2023), in a study directly examining ESP needs of Computer Network Engineering students in a vocational high school context, similarly found that students recognized English as a critical requirement for navigating technical environments, particularly in relation to software use, documentation, and online resources. The present study reinforces this finding, with understanding computer terminology emerging as the most dominant anticipated need, selected by 80% of students, followed by using English-language software and writing technical reports, each selected by 50% of students.

These findings align with Hyland's (2022) argument that ESP learners need to acquire field-specific literacies and discourse practices, as the tasks students identified are precisely the kinds of field-specific literacy practices that general English instruction does not address. Sari and Wirza (2021) further confirm that vocational high school students in Indonesia need ESP to meet workplace demands, and the present findings support this position by showing that students themselves are already aware of and able to articulate the specific English tasks their future careers will require.

Present Situation Analysis

The PSA findings reveal a significant gap between what students need and what they can currently do in English. With an overall PSA mean of 3.05 out of 5.0, students are situated at a basic-to-intermediate level, which falls considerably short of the English competence required for the technical workplace tasks identified in the TSA. This gap is most pronounced in productive skills, with writing simple sentences and explaining computer topics confidently both rated at a mean of 2.60, the lowest scores across all PSA indicators. This is particularly concerning given that writing technical reports and messages was identified by 50% of students as a key anticipated workplace need in the TSA, meaning students are weakest in exactly the skill they expect to need most. This pattern echoes what Murdanianto and Mas Muhammad (2026) found in their needs analysis of office administration students in Indonesian vocational schools, where a clear mismatch was identified between students' communicative goals and their current language competence, particularly in productive skills.

The difficulties most commonly reported by students, pronunciation (70%), grammar (50%), and vocabulary (50%), further reflect the foundational gaps that characterize the current state of English instruction in many Indonesian vocational schools. Nurhasanah and Kurniawan (2023) similarly found

that Computer Network Engineering students demonstrated significant weaknesses in technical vocabulary, which the present study confirms as an area where students report active difficulty. Basturkmen (2010) argues that ESP courses must be rooted in a precise analysis of student needs, and the PSA findings here clearly illustrate that without targeted instruction addressing these foundational gaps, students will remain underprepared for the language demands of their field. The finding that only 2 out of 10 students reported receiving any computer or network-related English content in their current lessons is particularly telling, as it confirms that most students are receiving general English instruction that does not reflect the specific language demands of their vocational context, a problem Muliyah and Aminatun (2020) identified as a systemic issue in Indonesian vocational English education.

Learning Situation Analysis

The LSA findings reveal two important issues: the content currently taught in English classes does not match what students need, and the way students prefer to learn is markedly different from how they are currently being taught. Despite this mismatch, students demonstrated a high level of motivation to learn English for their field, with a mean motivation score of 4.1 out of 5.0. This finding is consistent with Hutchinson and Waters' (1987) argument that learning needs encompass not only preferred methods and materials but also the motivational orientation of learners toward the target language. The high motivation score suggests that the barrier to effective English learning for these students is not attitudinal but instructional, they want to learn, but the current curriculum does not give them the right tools or content to do so effectively.

The overwhelming preference for hands-on, practice-based learning (90%) and technology-integrated tools, particularly AI-based tools (60%) and language learning applications (50%), reflects a broader shift in how vocational learners engage with language learning outside the classroom. This aligns with findings by Nurhasanah and Kurniawan (2023), who found that Computer Network Engineering students expressed clear preferences for interactive and technology-supported learning approaches. Widodo (2016) and Yen Dang (2021) similarly argue that ESP instructional design for vocational contexts should prioritize authentic, practice-oriented tasks that mirror real workplace demands rather than abstract grammar exercises or general reading texts. The present findings reinforce this position strongly, as students' open-ended responses revealed that many are already independently engaging with English through watching foreign tutorial creators and using AI tools outside the classroom — a form of self-directed ESP learning that the formal curriculum has yet to reflect. Dudley-Evans and St John (1998) emphasize that effective ESP course design must be grounded in learners' actual learning needs and preferences, and the LSA findings here provide clear empirical guidance for how English instruction at SMK Swasta YPK Medan can be redesigned to better serve its students.

CONCLUSION

This study examined the English language needs of Computer Network Engineering students at SMK Swasta YPK Medan through the needs analysis framework proposed by Hutchinson and Waters (1987), consisting of Target Situation Analysis, Present Situation Analysis, and Learning Situation Analysis. The findings reveal that students hold a strong awareness of English as a frequent and essential tool in their future professional careers, particularly for understanding computer terminology, navigating English-language software, and writing technical reports. However, their current English proficiency remains at a basic-to-intermediate level, with productive skills — writing and speaking — identified as the most significant areas of weakness, despite being among the most anticipated workplace needs. The present English curriculum received by students is predominantly general in nature, with only a small minority reporting exposure to computer and network-related English content, reflecting a clear gap between what students need and what they are currently being taught. Despite this, students demonstrated high motivation to learn English for their field and expressed strong preferences for hands-on, practice-based learning supported by technology-integrated tools such as AI applications and language learning platforms. Taken together, these findings suggest that English instruction at SMK Swasta YPK Medan needs to be redesigned along ESP principles that prioritize field-specific

ISSN 2963-7856 (print), ISSN 2961-9890 (online)

vocabulary, technical reading and writing skills, and technology-supported learning approaches that reflect both the occupational demands of the computer and network engineering field and the learning preferences of its students.

ACKNOWLEDGMENTS

Peneliti menyampaikan ucapan terima kasih kepada pihak yang sudah berkontribusi dalam pelaksanaan penelitian dan penyusunan artikel ini.

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ISSN 2963-7856 (print), ISSN 2961-9890 (online)