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ESP Requirements in Vocational Education: Insights from Computer and Network Engineering Department

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Abstract: This study aims to determine the learning situation and needs of English language specific to the field of computer and network engineering department in vocational schools seen from the perceptions of students, English teachers, and the head of the department. This survey research was conducted in 21 state vocational high schools spread across Gorontalo province involving 211 computer and network engineering students, 21 English teachers, and 21 department heads as respondents. The questionnaire instrument was distributed to students to find out the English language and methods they need according to their major, while interviews were conducted with English teachers and the head of the department to explore information related to the implementation of English language learning at school and what kind of English language methods and materials are needed by students so that they can be useful in the world of work as the students graduate. The questions asked covered the aspects of necessity, lack, and wants. The results show that English learning in vocational schools is still dominantly using general English even though English teachers are well aware of the importance of specific English for the students. The teachers and head departments of computer and network engineering agree to the collaborative teaching method involving both English and the subject-specific teacher to provide a more relevant and specific learning environment in vocational settings.

Keywords*: English for specific purposes; material developments; computer & network engineering*

A. INTRODUCTION

Vocational schools aim to prepare students for immediate employment upon graduation, as emphasized in the national education system, requiring them to possess both skills in their vocational field and the ability to communicate in English as the global scientific language. English for Specific Purposes (ESP)(Chambers, 1980) is thus ideal

for English learning in vocational schools, as it must align with the specific vocational needs of students (Lestari & Martiarini, 2021; Nuriya Axmedovna et al., 2019). Computer and network engineering is a popular department in many vocational schools, with a high potential for job opportunities in the digital 4.0 era (Achmad et al., 2020). Therefore, it is crucial to equip these students with relevant English language skills to meet the job market demands.

Despite the need for ESP, initial observations reveal that English learning in vocational schools often uses general English materials, resources, and evaluations across all departments (Aboe & Ismail, 2020; Albiansyah et al., 2020). This approach does not cater to each vocational field's specific English learning needs. One significant reason is the lack of teacher interest in developing tailored materials, primarily due to their limited understanding of the specific English needs of students in different departments (Asmin, 2019). Furthermore, there is a scarcity of textbooks force teachers to rely on generic internet materials rather than targeted resources (Nikoopour & Farsani, 2011).

The current mismatch between the general English curriculum and the specific needs of vocational students, particularly in computer and network engineering, hampers the students' readiness for the workforce (Lockwood, 2012). Addressing this issue is urgent to enhance the employability of vocational school graduates in a competitive global market. The absence of (Fadlia et al., 2022) and the continued use of general English materials underline the need for immediate intervention to develop relevant English teaching materials.

Previous research on needs analysis has largely focused on the perspectives of English teachers and students regarding the necessary materials for vocational school students (Nikoopour & Farsani, 2011; Şendurur et al., 2018; Syifa & Safitri, 2020; Tomlinson, 2011). However, this study aims to broaden the scope by also involving the heads of the computer and network engineering departments. These department heads have a deeper understanding of the vocational content that needs to be integrated into the English curriculum to be applicable and beneficial in the workforce. This comprehensive needs analysis can inform the development of specific English teaching materials tailored to computer engineering students.

The primary objectives of this study are to elaborate on the perceptions of students regarding the English language learning they need for the world of work, explain the

perceptions of English teachers related to the English learning needs of their students, and capture the perceptions of the heads of the computer and network engineering departments on the materials that should be taught to meet the demands of the students' future careers.

By integrating the perspectives of students, English teachers, and department heads, this research aims to project specific English teaching materials that are relevant and beneficial for computer and network engineering students in vocational schools. The findings will provide a foundation for creating a more effective ESP curriculum that aligns with the vocational goals of these students, ultimately enhancing their readiness for the global job market.

B. RESEARCH METHODS

This research employed a quantitative method, utilizing a survey technique for data collection. Survey research is characterized by the use of questionnaires as the primary instrument for gaining data from both large and small populations (Sugiono, 2014) which aims to solicit respondents' beliefs, opinions, characteristics, and behaviors (Stimson, 2014; Story & Tait, 2019; Tsakos, 2015).

The research population consisted of 983 students majoring in Computer and Network Engineering in class XI across 21 state vocational schools in Gorontalo Province. From this population, a sample of 211 students was selected. Additionally, the study also involved 21 English teachers and 21 heads of computer and network engineering. The Isaac and Michael table, cited in Sugiono (2010), was utilized in the sampling procedure.

In this study, data collection was carried out by distributing questionnaires to students which consisted of closed questions with Likert scale interval scores ranging from 1 to 5, and interviews with English teachers and heads of the department to gather qualitative insights. This dual approach aimed to identify the specific English learning needs of students majoring in computer and network engineering. These instruments cover 3 aspects of needs analysis: necessities, lacks, and wants.

Before distribution, the validity and reliability of the questionnaire were tested. The validity test ensured that the questionnaire effectively measured specific English learning

needs within the ICT major. Reliability testing was conducted to ensure the consistency of the measuring instrument. Both tests were performed using SPSS software.

The analytic description method was used in this research. The questionnaire was analyzed by calculating the percentage results and the interview data was described in detail to support the data from the questionnaire and answer the problems in the research.

C. FINDINGS AND DISCUSSION

Findings

This section provides information on the students' perspectives gained from the questionnaire as well as perceptions of English teachers and head departments of computer and network engineering extracted from interviews.

Students' perspectives on ESP learning needs

The questionnaire distributed to students was structured in the form of Likert scale, open- and closed-ended questionnaire, and divided into two parts that aim to find out the target needs which include lacks and wants. Lacks are the shortcomings or gaps between the level of skills that students have and the skills needed, while wants include the expectations that students consider necessary in learning English. In addition, the questionnaire results also describe information about learning needs, namely English learning methods

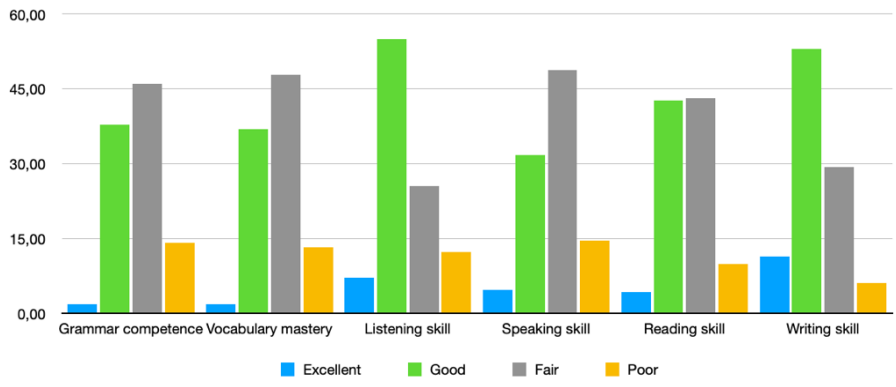


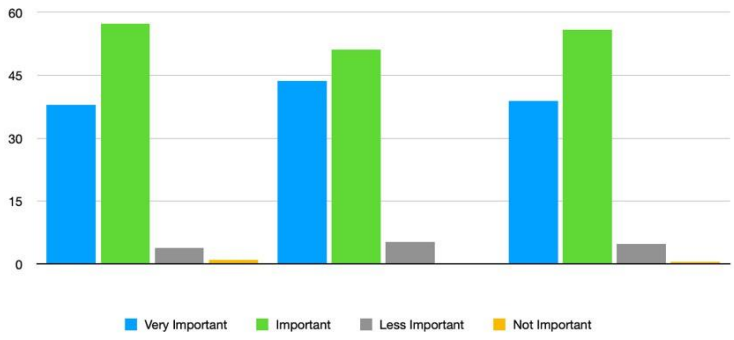
Table 1

Statement	Excellent	Good	Fair	Poor
Grammar competence	1,90	37,91	45,97	14,22
Vocabulary mastery	1,9	36,96	47,87	13,27
Listening skill	7,11	54,98	25,59	12,32
Speaking skill	4,74	31,75	48,82	14,69
Reading skill	4,27	42,65	43,13	9,95
Writing skill	11,37	53,08	29,38	6,16

Chart 1. Needs analysis of the students' lack of ESP teaching and learning

The chart above shows the students' level of English competence where 45.97% rated their grammar skills as fair and 14.22% as poor, while 37.91% in the good category and 1.90% in the excellent category. For vocabulary mastery, 101 students or 47.87% rated their ability to be in the fair category. As for language skills, 116 students or 54.98% of students rated their listening skills in the good category, 103 students or 48.82% of students rated their speaking skills in the fair category, 91 students or 43.13% in the category of fair in reading, while in writing skill there were 112 or 53.08% of students who rated themselves in the good category.

In addition, the most dominant difficulties faced by students in learning English are the use of grammar (68%), followed by the use of common expressions in English (24.2%), and the difficulty of using computer and network engineering terms in English (7.8%). Furthermore, the internal factors affecting English learning difficulties are lack of mastery of language skills (38.3%), lack of vocabulary (32.4%), and lack of understanding of grammar (28.8%). Meanwhile, external factors that influence English learning include innovative learning media (31%), varied learning resources (30.1%), teaching methods (27.9%), and competent teachers (11%).



Statement	Very Important	Important	Less Important	Not Important
Role of English learning for Computer & Netword Engineering Department	37,91	57,35	3,79	0,95
Understanding English reading texts about computer & network engineering	43,60	51,18	5,21	0
Role of English in computer & network engineering jobs	38,86	55,92	4,74	0,47

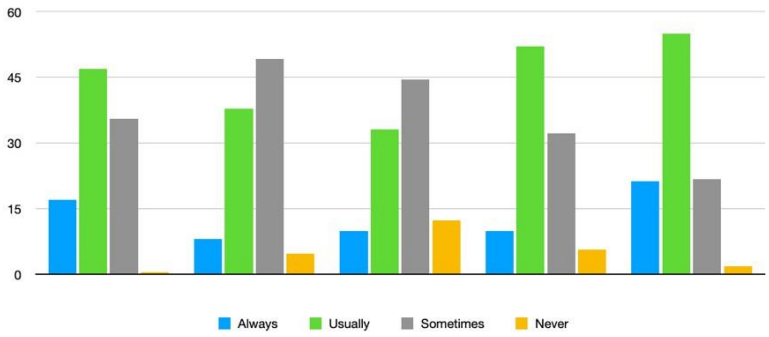
Chart 2. Needs analysis on the importance of English language learning

The chart above reflects what the students consider necessary for English learning in their major. There were over fifty percent of students stated that the role of English was important for computer and network engineering major. In addition, there were

51.18% of students who needed English to understand texts/readings about computer networks, and there were 55.92% who believed that English is important in the world of work of computer and network engineering fields.

Regarding the purpose of learning English, 67.7% of students stated they learn English to be used in the world of work, 18.3% to continue their studies, and 14% learned English only as a compulsory subject at school. Meanwhile, in terms of English materials, 38.8% of students need materials related to the world in the field of computer networks, 32.4% of materials about daily activities, and 28.8% need materials related to the computer systems expertise program. Furthermore, English skills that are mostly needed by students in their future work majoring in computer engineering are speaking skills in the first place at 42.2%, followed by reading at 36.1%, listening skills at 12.8%, and finally writing skills at 8.7%.

In more detail about the topics of computer and network engineering to be taught in English, most students need materials about network service technology, network computer terms, computer systems, software and hardware design and development, computer programming, PC installation, and only a small number of students who still need general English materials such as offers and suggestions, grammar, giving opinions and thoughts.



Statement	Always	Usually	Sometimes	Never
The learning process in class uses general English	17,06	46,92	35,55	0,47
I learn about computer system in English subject	8,06	37,91	49,29	4,74
Teacher uses lecturing method in teaching English	9,95	33,18	44,55	12,32
Teacher uses discussion activiry in teaching English	9,95	52,13	32,23	5,69
Teacher gives general English task/test in the class	21,33	54,98	21,8	1,90

Chart 3. English learning in the Computer and Network Engineering Department

This section describes the English learning situation in the classroom. There were 46.92% of students who stated that English is usually taught using general English, and 17.06% stated always, while only 0.47% stated never. In contrast, 49.29% of students stated that learning about computer systems in English with the category of sometimes, usually category by 37.91%, always category by 8.06%, and never category by 4.74%.

For learning methods, 33.18% of students stated that teacher usually teaches English using the lecture method, and 52.13% of students stated that the discussion method is usually used in the learning process. In terms of assignments or evaluations, 54.98% of students stated that teacher usually gives assignments related to general English.

In addition, the students were also questioned about English learning process they need and the results showed that 60.3% preferred discussion methods, 41.6% practice, 24.2% memorization, and 14.6% choose problem solving. While learning activities that are more desired by students in listening skills include listening to short dialogs and answering questions based on dialogs (52.5%). For speaking skills, students want activities to practice conversation (53.9), and in reading skills, students prefer classroom activity which involve translating English text into Indonesian (48.4%), looking up the meaning of vocabulary in the dictionary (32.9%), and answering questions from a reading (18.7%). And finally writing activities that students want are completing sentences (47.5%), rearranging sentences into proper paragraphs (37.9%), and writing paragraphs on a topic (14.6%).

Based on this questionnaire, it is known that the learning resources used by students in learning English are from the internet by 76.7% and from textbooks by 58%, and from these learning resources 70.3% is general English and 29.7% is specific English. The results of this questionnaire also illustrate students' perceptions regarding how often English will be used in the world of work in the field of computer and network engineering. An amount of 47.9% of students stated that English will be used to read computer engineering texts, 45.7% to operate computers terms in English, 21.9% for daily interactions, and 21% when presenting network system projects.

Teachers usually give assignments as a form of assessment and evaluation of English learning content in the department and still also give quizzes, formative tests, and summative tests. In terms of the content evaluated, 67.6% of the English content is

general and 32.4% of the assessment content includes computer and network engineering-specific English. Meanwhile, students' perceptions related to the English subject teachers in the department, 60.3% chose to be taught by English teachers, 33.3% chose to be taught by a collaboration between English teachers and TKJ teachers, and 6.4% chose to be taught by computer and network engineering teachers.

English teachers' perceptions of ESP language learning

The results of interviews conducted with 21 English teachers in 21 state vocational schools in Gorontalo province show that the implementation of English learning in vocational schools still focuses on general English, which is not in line with the spirit of vocational learning.

Among the total of English teacher participants, there are 20 teachers with bachelor's degrees and 1 master's degree. It is also known that only 1 teacher specifically teaches in the computer and network engineering department while the other 20 teachers also teach English in different departments. Most of the 19 teachers have participated in self-development training such as curriculum training, SMA-SMK English learning training, and professional development programs. However, only 4 teachers have participated in specific English teaching training.

According to 16 teachers, the English proficiency of computer and network engineering students is mostly at the basic level and some at the intermediate level. Lack of vocabulary mastery is the main weakness of students in English, followed by weaknesses in terms of 4 language skills, as well as grammar. In the learning process, 20 teachers admitted that they still dominantly apply general English learning, including material and assessment content, and 1 teacher combines general and specific English. As for specific learning, 13 teachers never use it, 7 teachers rarely teach specific English, and only 1 teacher usually teaches specific English.

Finally, based on the interviews of the English teachers, 6 teachers believed that the English subject should remain entirely taught by the English teachers, while the other 15 teachers preferred collaboration between the English teachers and the computer engineering teachers in terms of the content of the material that needs to be taught to the students.

Perception of the Head of the Computer and Network Department

From the interviews, it is found that all department heads realize the necessity of English for computer and network engineering students, particularly in operating computers because most of the terms and commands in computers are in English. For the topics needed by students in their future jobs, the department heads mentioned network maintenance, network installation, computer device installation, optical fiber, network systems, basic computers, operating ms. Office, network administration, and hardware.

Regarding the English language skills, 17 department heads stated that computer engineering students need more reading skills in order to understand texts and commands and terms in computer network engineering. While 4 other department heads stated that the students need speaking skills.

Similar to the perception question about who should teach English in the computer and network engineering department, 3 department heads choose English teachers who are more appropriate to teach English subjects because English teachers are more proficient in linguistic content. Meanwhile, 18 other department heads chose collaboration between English teachers and computer engineering teachers.

Discussion

Vocational High School Students

The data findings from the questionnaire reveal significant insights into students' perspectives on their English learning needs within the context of computer and network engineering. The first chart highlights that the majority of students rate their grammar and vocabulary mastery as fair, indicating a clear need for targeted instruction in these areas. This lack of proficiency is further evidenced by the substantial percentages of students who find grammar (68%) and common expressions (24.2%) challenging. These findings suggest that a curriculum focusing on grammar and vocabulary enhancement could bridge the gap between current competencies and desired proficiency levels.

The second chart also highlights how important English is to students' academic and professional goals. Over half of the students are aware that proficiency in English is required to comprehend technical texts and get ready for professions in computer and network engineering. This fits with their stated goals of learning English, which are mainly for future education (18.3%) and professional use (67.7%). It is clear from the

students' preferences for relevant and useful materials, such as those related to computer networks, that a specified English curriculum that combines technical content with language teaching is required (Sakkir et al., 2021).

Lastly, the third chart reveals how the students currently view their English learning environment. A significant portion of students experiences general English instruction, with a notable percentage advocating for more specialized content. The preference for discussion and practice-based learning methods suggests that interactive and applied learning strategies would be more effective. Furthermore, the data indicates a reliance on internet resources (76.7%) and a desire for more specific English content related to their field, highlighting the need for accessible and relevant learning materials. In summary, these findings justify the development of a tailored English curriculum that addresses both general and specific language needs, utilizes interactive teaching methods, and incorporates relevant technical content to better prepare them for the workforce.

EFL Teachers

The interview data from 21 English teachers in vocational schools within Gorontalo province reveals a significant disconnect between the current English instruction and the specialized needs of students in the computer and network engineering department. Despite the vocational focus of these schools, the majority of English teachers (20 out of 21) predominantly teach general English, which does not align with the specific language demands of the technical field. This mismatch is further compounded by the fact that only one teacher is specifically dedicated to the computer and network engineering department, and only four teachers have undergone training in specific English teaching. This indicates a critical gap in teacher preparedness and highlights the necessity for targeted professional development programs that equip teachers with the skills to deliver specialized English instruction (Saragih, 2014).

Moreover, the teachers' perception of students' English proficiency being largely at a basic level, with significant weaknesses in vocabulary, grammar, and the four language skills, emphasizes the urgent need for a curriculum redesign. The identification of these flaws by 16 teachers suggests that there is a systemic problem with the existing teaching methodology. The preference expressed by 15 teachers for a collaborative teaching model, where English teachers work alongside computer engineering teachers, suggests a practical solution to bridge this gap. With this cooperative approach, the

English curriculum might be more specifically suited to the needs of the students and more relevant to their field of study, which would improve the students' language ability in a relevant environment.

Therefore, the data indicates a pressing need for a shift from general to specific English instruction in vocational schools. Implementing targeted professional development for English teachers and fostering collaboration between English and technical subject teachers can significantly improve the relevance and effectiveness of English language education, better preparing students for their professional careers

Head Departments

The perspectives of the heads of the Computer and Network Department underscore the critical role that English plays in the field of computer and network engineering. The unanimous recognition of the necessity for English proficiency, particularly for operating computers where terms and commands are predominantly in English, highlights the importance of integrating technical English into the curriculum. The department heads identified specific topics such as network maintenance, installation, and administration, which are essential for students' future careers. This indicates a need for a curriculum that includes specialized vocabulary and technical language relevant to these areas, ensuring students are well-prepared for the practical demands of their profession (Hunt & Beglar, 2005).

Furthermore, the emphasis on reading skills by 17 department heads reflects the critical need for students to understand technical texts, commands, and terms in their field. This focus suggests that a significant portion of the English curriculum should be dedicated to developing students' reading comprehension skills in a technical context. The preference for collaboration between English teachers and computer engineering teachers by 18 department heads supports the idea of a multidisciplinary approach to teaching English. This collaboration would combine linguistic expertise with technical knowledge, providing students with a more holistic and relevant learning experience. It would ensure that the English instruction is directly applicable to the technical content, thereby enhancing the overall efficacy of language education in the vocational setting.

D. CONCLUSION

The research reveals a comprehensive understanding of the perceptions of students, teachers, and department heads regarding the English for Specific Purposes (ESP) learning needs within the context of computer and network engineering. Students predominantly rate their grammar and vocabulary skills as fair, highlighting a critical need for targeted instruction to improve these areas. They recognize the importance of English for their academic and professional goals, expressing a preference for curriculum content that combines technical knowledge with language skills. Moreover, students favor interactive and practical learning methods, suggesting that an ESP curriculum should incorporate discussion and practice-based activities to enhance their learning experience. In addition, Teachers' insights expose a significant disconnect between current English instruction and the specialized needs of students. The predominance of general English teaching, with limited training in specific English for the technical field, indicates a gap in teacher preparedness. Furthermore, the majority of teachers and head departments support a multidisciplinary teaching approach that underscores the collaboration of between English and computer engineering teachers to provide a more relevant and holistic learning experience. This collaboration could ensure that the curriculum is aligned with the specific language demands of the students' field, improving the relevance and effectiveness of English education in vocational schools. Future research should focus on evaluating the effectiveness of such collaborative teaching models and developing professional development programs for teachers to deliver specialized English instruction. Additionally, exploring the impact of specific ESP curricula on students' proficiency and career readiness would provide valuable insights for further curriculum improvements.

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