

Designing E-Comic for English Learning Based on Needs Analysis: A Mixed-Methods Study of Vocational High School Students

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ABSTRACT

Vocational high school (SMK) students have unique English learning needs compared to those in general schooling, as they require language skills relevant to their vocational fields such as computer, multimedia, and software development. Conventional English learning materials often fail to meet these needs because they lack contextual and engaging content. This study investigates the specific language needs, learning challenges, and media preferences of vocational students as a basis for designing digital learning materials, particularly e-comics, to support vocational English instruction. Adopting a mixed-methods design, data were gathered through questionnaires administered to 104 SMK students and semi-structured interviews with two vocational English teachers. The quantitative data identified vocabulary and comprehension as the most significant challenges, while the qualitative findings revealed students' struggles in applying technical terminology and maintaining motivation during lessons. Students also emphasized the need for learning activities that promote active language use, such as conversation, storytelling, and task-based projects related to their fields of study. Both students and teachers expressed strong preferences for interactive and contextual learning media, noting that traditional textbooks often feel irrelevant to workplace communication demands. The integration of digital tools, particularly e-comics, was perceived as a promising approach to enhance engagement, vocabulary acquisition, and communicative competence. The study concludes that incorporating needs-based, contextually relevant, and visually appealing digital materials can significantly improve the effectiveness of vocational English learning and better prepare students for professional communication in their respective disciplines.

I. Introduction

The rapid development of digital technology has significantly influenced the way students learn and interact with educational resources [1]. In the context of English for Specific Purposes (ESP), particularly Vocational English, students in vocational high schools (SMK) are expected to acquire language competencies that are not only functional but also relevant to their field of study and future workplace demands [2]. However, traditional approaches to teaching English often fail to address the specific needs, challenges, and preferences of vocational students, resulting in a lack of motivation and limited language mastery [3], [4]. To bridge this gap, the integration of innovative and

engaging learning media, such as electronic comics (e-comics), has emerged as a promising solution [5], [6].

Needs analysis plays a pivotal role in designing effective learning materials, as it provides a clear understanding of learners' linguistic requirements, learning challenges, and expectations [2], [7]. In vocational high schools, students often face difficulties in mastering vocationally oriented English due to limited exposure, unfamiliar technical terms, and lack of engaging learning media [8]. Taken together, these studies suggest that vocational English problems are not merely linguistic, but also pedagogical and contextual in nature. For example, research on Visual Communication Design students at SMK in East Java revealed that learners expressed strong demand for speaking and vocabulary materials tailored to their vocational field [8]. Similarly, [Safira et al.] [3] highlight that many SMK graduates remain underprepared for workplace communication due to misalignment between curriculum design and industry expectations. [4] further report that vocational students struggle with speaking skills because of low confidence, lack of practice, and insufficient support from learning materials. Synthesizing these findings indicates a recurring pattern: inadequate material relevance and limited communicative practice jointly hinder vocational students' English development. Thus, identifying their perceived needs and challenges is essential in tailoring instructional design to ensure both relevance and effectiveness.

In addition to identifying challenges, understanding students' preferences for topics, tasks, and learning media is equally important. With the increasing popularity of digital-based resources, vocational students are likely to benefit from interactive and visually stimulating learning tools [9], [10]. Studies conducted in Indonesian vocational schools have confirmed that digital learning resources improve comprehension, motivation, and classroom participation [10], [11]. Rather than functioning solely as supplementary tools, these resources appear to play a central role in sustaining learner engagement in ESP contexts. Specifically, [6] found that digital comic strips significantly enhanced students' engagement in reading comprehension because the combination of visuals and narratives helped learners understand texts more effectively. Likewise, [5] demonstrated that digital comics improved vocabulary acquisition among EFL learners during remote learning. In Surabaya, the use of smartphone-based interactive media was also reported to boost communication skills and confidence in students [12]. Collectively, these studies indicate that technology-mediated materials support both cognitive processing and affective engagement. These findings highlight that students' preferences for engaging, technology-based materials should be integrated into ESP instruction. Developing e-comics aligns with these preferences, as they combine storytelling, imagery, and contextualized language use [6], [8].

Furthermore, adopting a mixed-methods approach enables a comprehensive understanding of students' needs. While quantitative data provide measurable insights into the general tendencies of vocational English requirements, qualitative data offer deeper perspectives into students' experiences and expectations [13]. Methodologically, relying on a single data source risks oversimplifying the complexity of vocational learners' needs. In the case of vocational English, quantitative surveys may highlight skills such as speaking and technical vocabulary as priorities, while qualitative interviews can reveal more nuanced issues like lack of confidence, anxiety, and insufficient real-world practice opportunities [4], [8]. For instance, [10] combined questionnaire results with classroom observations and interviews to show that while digital literacy elements were partially embedded in SMK English textbooks, many important aspects such as online safety and digital citizenship were neglected in actual learning tasks. This convergence of findings demonstrates how qualitative evidence can explain and contextualize quantitative trends. Thus, qualitative insights can serve to support and enrich the quantitative findings, leading to more accurate and holistic needs assessment.

Despite existing studies highlighting vocational students' English difficulties and the potential of digital learning media, there remains a lack of research that systematically integrates learners' perceived needs, learning challenges, and media preferences into the design of context-specific instructional materials. Moreover, few studies have employed a mixed-methods needs analysis as a foundational step for developing digital learning resources tailored to vocational English contexts. In light of these considerations, this study aims to design an e-comic for English learning based on a thorough needs analysis of vocational high school students. This study answered the following research questions:

1. What are the perceived needs and challenges of vocational high school students in learning Vocational English?
2. What are the students' preferences for topics, tasks, and learning media in Vocational English, particularly in relation to digital-based resources?
3. How do qualitative insights from students' experiences support and enrich the quantitative findings of their Vocational English needs?

The findings are expected to contribute to the development of innovative ESP materials, promote learner engagement, and provide pedagogical implications for integrating digital media in vocational education, particularly in regions such as East Java where gaps between industry expectations and English education remain significant [3], [8].

II. Literature Review

This section presents literature relevant to the current study, which includes needs analysis, English for Specific Purposes (ESP and Vocational English, and E-Comic in education.

Needs Analysis (NA)

[14] outline a comprehensive approach to Needs Analysis (NA), which is integral to designing and implementing effective language programs. [14] differentiate between two critical aspects of Needs Analysis: perceived needs and defined needs. Perceived needs are those that learners believe they have, based on their personal experiences, aspirations, or challenges with language use. On the other hand, defined needs are those determined by the instructor or curriculum designer, based on an understanding of the language functions necessary for learners to achieve specific communicative goals in various contexts. While this perspective establishes NA as conceptually important, it does not fully explain how needs data are translated into concrete instructional materials, particularly in vocational contexts where learning outcomes are task- and skill-oriented.

Richards and Rodgers argue that the insights gathered from Needs Analysis directly inform the design of the syllabus and selection of teaching methods. By understanding the learners' needs, educators can select content that is both relevant and practical, ensuring that it addresses the specific communicative tasks that learners are likely to encounter in their real-life contexts. For example, if the analysis reveals that learners require language for travel purposes, the syllabus might include vocabulary and structures related to navigation, accommodations, and social interactions [14]. Furthermore, the teaching methods can be adapted to the learners' preferences, with an emphasis on task-based learning, communicative practice, or project-based activities, depending on the nature of the needs. Therefore, it is crucial for educators to actively involve learners in identifying their needs through surveys, interviews, or reflective exercises. This aligns with the idea of learner autonomy, where students become more self-aware of their learning needs and take responsibility for their own progress [15]. However, many empirical studies stop at reporting learners' needs without demonstrating how these learner voices inform subsequent material design decisions.

Furthermore, Needs Analysis should not be seen as a one-time activity conducted before the course begins. Rather, it should be a dynamic and iterative process, where the educator periodically revisits the learners' needs throughout the course. This allows the teacher to adjust the syllabus and teaching methods as needed, responding to any shifts in learners' language requirements. Additionally, ongoing NA enables the identification of any gaps in learning that might emerge during the course, allowing educators to intervene with targeted support or adjustments [14]. This iterative view of NA is particularly relevant for digital material development, where learner feedback can inform revisions to content, layout, and multimodal features.

English for Specific Purposes (ESP) and Vocational English

English for Specific Purposes (ESP) is a branch of English language teaching that focuses on meeting the specific needs of learners in particular disciplines, professions, or academic contexts. According to [7], ESP is characterized by its learner-centered approach and its emphasis on addressing the immediate and future language needs of learners. [16] further elaborate that ESP is defined by three absolute characteristics: (1) it is designed to meet the specific needs of learners; (2) it uses the methodology and activities of the discipline it serves; and (3) it is centered on the language (grammar, lexis, register), skills, discourse, and genres appropriate to these activities. These principles distinguish

ESP from general English by its direct connection to learners' professional or academic goals. Despite these principles, vocational English instruction in practice often falls short of fully realising ESP's learner-centred and context-specific orientation.

In the Indonesian Context, vocational English, as a subset of ESP, refers to the teaching of English tailored for vocational school students to prepare them for specific occupational contexts. In Indonesia, vocational high schools (SMK) are mandated to produce graduates who are competent not only in their technical skills but also in communication skills, including English [2]. However, several studies highlight that English learning in SMKs often remains general and does not adequately address the demands of industries [3]. This persistent misalignment suggests a gap between ESP theory and its pedagogical implementation in vocational classrooms. This misalignment leads to graduates who are technically skilled but linguistically underprepared to face global workplace communication challenges.

Research also shows that SMK students face unique challenges in mastering English, especially vocationally oriented English. [14] identified that many vocational students struggled with speaking because of limited opportunities to practice, low confidence, and inadequate exposure to authentic materials. Similarly, [8] found that students in Visual Communication Design programs emphasized the importance of vocabulary and speaking skills tailored to their field but noted that existing materials often failed to address these needs. While these studies successfully document learners' difficulties, they largely focus on problem identification rather than demonstrating how needs analysis can systematically inform material development. These findings suggest that Vocational English should focus more on workplace communication, technical vocabulary, and real-life tasks relevant to the learners' professional contexts. This study contributes beyond previous research by linking a mixed-methods needs analysis to the development of e-comic, showing how learners' needs can be transformed into concrete, contextually relevant ESP materials rather than remaining at the descriptive level.

E-Comic in Education

Digital comics, often referred to as e-comics, have gained increasing attention as innovative tools for education, particularly in language learning. E-comics combine visual narratives with text, which can facilitate comprehension and engagement for learners who may struggle with traditional reading materials [17]. By providing contextualized dialogues and visual cues, e-comics help students infer meaning from both linguistic and non-linguistic elements, making them especially effective for second language (L2) acquisition [18].

In the context of English as a Foreign Language (EFL), e-comics offer interactive and motivating learning experiences. They integrate storytelling with multimodal resources—such as images, speech bubbles, and onomatopoeia—that support vocabulary retention and pronunciation practice [19]. Moreover, the use of e-comics in classrooms can reduce language anxiety, as learners feel more engaged and less pressured when processing visual texts compared to purely written ones [20].

E-comics are also aligned with the principles of multimodal literacy, which emphasize the integration of visual, textual, and digital modes of communication in modern pedagogy [21]. This makes them suitable for 21st-century learners, particularly vocational high school students who often prefer interactive and digital-based resources to enhance their learning experiences [22]. Therefore, e-comics not only provide an enjoyable learning medium but also serve as an effective pedagogical strategy to address learners' needs in developing English proficiency in meaningful and engaging ways.

III. Method

This study employed a mixed-methods design, integrating both quantitative and qualitative approaches to obtain a comprehensive understanding of vocational high school students' needs in learning English and to guide the design of an educational e-comic. Mixed-methods research was chosen because it allows researchers to triangulate data, validate findings, and provide a richer analysis compared to using a single method [13]. The quantitative phase focused on identifying general patterns of students' needs, while the qualitative phase aimed to explore deeper insights from teachers' experiences. This approach is particularly relevant in educational technology and materials

development, where understanding both learner preferences and contextual challenges is essential [23].

Research site and Participants

The participants were vocational high school students (aged 15–17) from a SMK X in East Java, Indonesia. A total of 104 students participated in the quantitative survey, while 2 English teachers were selected purposively for in-depth interviews. The inclusion of both students and teachers allowed for a more balanced understanding of classroom practices and expectations [24]. This study was conducted at SMK X, which was purposefully selected because it represents a typical vocational high school offering Computer and Multimedia programs. The school was chosen due to its large student population, active English learning environment, and accessibility for the researcher, making it a suitable context for exploring students' needs in learning Vocational English.

Data Collection Instruments

To collect data for Needs Analysis, two main instruments were used:

1. *The Vocational English Needs Analysis Questionnaire (VENAQ)*

The Vocational English Needs Analysis Questionnaire (VENAQ) – which is a structured questionnaire adapted from [25], [26], [27] was administered to investigate learners' necessities, lacks, and wants in vocational English. The first was used to investigate the English language needs of cabin services program students and developing a vocational curriculum based on needs analysis with an emphasis on speaking and listening skills. The second was used to analyze the English needs of OTKP majoring vocational high school students, it was found that learning was still dominated by General English and emphasized the need for contextual speaking and writing. The last one was used to identify the ESP needs of students majoring in Electronic Industrial Engineering at vocational schools, with the result that the majority need speaking and reading materials based on real work situations.

To ensure content validity, the adapted questionnaire items were carefully reviewed to align with the objectives of vocational English learning and the specific context of SMK students. The adaptation process focused on retaining core constructs from the original instruments while modifying wording and examples to suit the vocational context and digital learning focus of this study. Prior to administration, the questionnaire was reviewed by experts in English language teaching and ESP to assess the clarity, relevance, and representativeness of the items.

The questionnaire consisted of open-ended and closed-ended items using a 5-point Likert scale to measure students' preferences for topics, tasks, and learning media, including digital comics. Reliability of the questionnaire was examined using internal consistency analysis through Cronbach's alpha, with the obtained alpha values indicating acceptable reliability, suggesting that the instrument consistently measured students' vocational English needs and preferences.

2. *Semi-Structured Interviews (Qualitative Phase)*

Semi-Structured Interviews (Qualitative Phase) – Interviews were conducted with selected teachers to gain deeper insights into challenges, attitudes, and expectations regarding English learning media. The semi-structured format allowed flexibility in probing participants' responses while maintaining focus on the research objectives [28]. To enhance the trustworthiness of the qualitative data, the interview protocol was developed based on the needs analysis framework and was reviewed by a qualitative research expert to ensure question clarity and relevance. In addition, credibility was supported through careful transcription and cross-checking of interview responses to ensure accurate representation of participants' perspectives. To enhance the trustworthiness of the qualitative data, the interview protocol was developed based on the needs analysis framework and was reviewed by a qualitative research expert to ensure question clarity and relevance. In addition, credibility was supported through careful transcription and cross-checking of interview responses to ensure accurate representation of participants' perspectives.

Data Collection Procedures

Data were collected in two sequential phases. First, the *quantitative survey* was distributed to all participants during classroom sessions with prior consent from schools. The *qualitative*

interviews were then conducted with selected participants to elaborate on the survey findings. Each interview lasted approximately 15–30 minutes and was audio-recorded with participants' permission. Ethical considerations were upheld by obtaining informed consent, ensuring confidentiality, and allowing voluntary withdrawal at any stage [29].

Data Analysis

The quantitative data from the questionnaires were analyzed using descriptive statistics (means, frequencies, and percentages) to identify dominant patterns of students' needs. In addition, descriptive statistics was applied to examine differences across difficulties, topics, and tasks. The qualitative data were analyzed using thematic analysis, following [30] six-step procedure, which included familiarization, coding, generating themes, reviewing, defining, and reporting. The integration of findings occurred in the interpretation stage, where quantitative results were explained and enriched with qualitative evidence. This methodological integration ensured validity and reliability of the research outcomes [31].

Research Procedure for E-Comic Design

The findings from the needs analysis were then used to inform the design of the e-comic. Following the ADDIE instructional design model (Analysis, Design, Development, Implementation, and Evaluation), the analysis stage was guided by the mixed-methods results, while the design stage involved developing storylines, characters, and language input aligned with vocational contexts [32]. The prototype was evaluated by both experts (English lecturers and instructional designers) and students or teachers for feedback and revision.

IV. Results and Discussion

The findings both from the questionnaire and interviews are systematically presented as follows:

1. Perceived Needs and Challenges in Learning Vocational English

The results of the Vocational English Needs Analysis Questionnaire (VENAQ) indicate that Indonesian vocational high school students recognize the importance of English in their future careers, yet they face considerable challenges in mastering it. Table 1 shows that vocabulary is the most significant barrier, with 31% of respondents citing it as their primary difficulty. Students described problems such as memorizing technical terms, recalling context-specific terminology, and applying new words in real situations. This is consistent with the nature of vocational education, where students in areas like multimedia or computer networking frequently encounter technical documents written in English. Another 24% reported difficulties with comprehension, particularly in understanding English texts and classroom materials, while smaller groups identified struggles with translation (9%), grammar (8%), and productive skills such as speaking (4%) and writing (2%). The relatively low numbers for speaking and writing may not mean that these skills are easy for students; rather, it reflects their prioritization of vocabulary and comprehension as foundational to other abilities.

Table 1. Vocational School Students' Reported Difficulties in English Learning

Category	% of Responses
Vocabulary (new terms, recall)	31%
Comprehension of texts/materials	24%
Translation	9%
Grammar / Tenses	8%
Speaking / Presentations	4%
Listening	3%
Reading	3%
Pronunciation	3%
Writing	2%
Context-specific (coding, TOEFL)	6%
General difficulty	3%
No difficulty / Neutral	7%

Teachers' insights strongly reinforced these trends. Mrs. Katherine, an English teacher at SMK Telekomunikasi, emphasized that weak vocabulary is the root of most student difficulties. She

observed that students who have strong vocabulary knowledge are able to grasp new material quickly and perform well in exams, while those with limited vocabulary consistently struggle. According to her, “when students have strong vocabulary knowledge, they can quickly understand any material and perform well even without much preparation.” Similarly, the teacher Mrs. Mili confirmed that limited vocabulary is the most common obstacle in her classes, explaining that because English is a foreign language rarely used outside of school, students have limited exposure to it and thus struggle to build a strong lexicon.

Another recurring challenge revealed by both the survey and interviews is motivation and engagement. One-third of students (33%) identified low motivation as a major problem in English learning. They described classes as boring, repetitive, and disconnected from their real needs. Teachers echoed these sentiments. Bu Katherine reported that some students disengage to the point of sleeping in class, especially when lessons are monotonous or overly teacher-centered. However, she also noted that using creative methods such as group activities, games, and project-based learning can dramatically improve student interest. Mrs. Mili agreed, explaining that textbook-based lessons often lead to boredom and even absenteeism, while lessons that integrate visual or digital media make students more excited and curious about what will happen next.

The interviews also highlight that although grammar was not the top challenge in the survey, teachers view it as secondary to vocabulary. Mrs. Katherine explicitly stated that “grammar is number two; vocabulary must come first,” because comprehension and performance depend heavily on word knowledge. These insights underline the centrality of vocabulary mastery as both a prerequisite for comprehension and a driver of confidence in other language skills.

After the text edit has been completed, the paper is ready for the template. Duplicate the template file by using the Save As command, and use the naming convention prescribed by your conference for the name of your paper. In this newly created file, highlight all of the contents and import your prepared text file. You are now ready to style your paper; use the scroll down window on the left of the MS Word Formatting toolbar.

2. Preferences for Topics, Tasks, and Learning Media

Students’ preferences for learning content and activities closely mirror the challenges they face. Table 2 shows that vocabulary and technical terminology was selected as the most important area of focus (36%), followed by speaking and communication (22%), grammar and tenses (9%), and writing tasks such as proposals or project documentation (7%). In open-ended responses, students specifically mentioned their need to learn how to read technical manuals, write proposals or reports, deliver presentations, acquire English for job interviews, and collaborate in team projects. These results reflect a strong awareness of the kinds of communication demands they will face in the workplace.

Table. 2. Preferences for Topics

Category	% of Responses
Vocabulary (incl. technical terms)	36%
Speaking / Communication	22%
Grammar / Tenses	9%
Writing (proposals, reports)	7%
Reading / Understanding	4%
General / All / None	22%

The teachers’ perspectives validated these findings. Both Mrs. Katherine and Mrs. Mili identified speaking ability as the most critical skill for vocational students. According to Mrs. Katherine, “mastering a foreign language is meaningless if it cannot be used in daily communication” . She stressed the importance of integrating all four skills—listening, speaking, reading, and writing—into a single learning process, but she positioned speaking as the ultimate indicator of mastery. Mrs. Mili further emphasized that speaking is especially crucial for presentations. She explained that presentations not only test students’ ability to use English but also ensure accountability, as they require students to demonstrate understanding of projects they have completed. In her words, being able to present allows teachers to confirm whether students “planned, executed, and presented their projects independently”.

In terms of learning tasks, students preferred activities that involve active language use, such as speaking/conversation (22%) and writing/storytelling (18%), over more passive tasks like reading or listening. This preference aligns with teachers' observations. For example, Mrs. Katherine frequently uses games and group presentations to encourage participation and build communication confidence, while Mrs. Mili stressed the value of role-play and direct modeling in front of students, which she believes helps them internalize language use more effectively.

Table 3. Preferred English Tasks

Category	% of Responses
Speaking / Conversation	22%
Writing / Storytelling	18%
Vocabulary & Grammar Exercises	13%
Reading / Translation	7%
Listening / Multimedia	8%
Tests / Quizzes	11%
General Positive (all/anything)	6%
No Preference / Negative	15%

When it comes to learning media, students expressed clear enthusiasm for digital and interactive resources. They favored video-based learning (e.g., YouTube, TikTok Edu), educational games, interactive quizzes, and especially interactive e-comics. Only a small proportion preferred traditional printed textbooks. Teacher interviews add depth to these findings. Mrs. Katherine described her use of PowerPoint slides, YouTube videos, and vocabulary puzzles like crosswords to engage students, but she acknowledged that such tools are often generic and not vocationally tailored. Mrs. Mili also emphasized that visual media such as videos and pictures are more effective than textbooks alone, as students find them colorful, engaging, and easier to understand.

Table 4. Preferred Learning Media

Media Type	Examples	Student Preference
Traditional Textbooks	Print books, LKS	Low
Video-Based Learning	YouTube, TikTok Edu	High
Interactive Quizzes	Quizizz, Google Form	High
Educational Games	Mobile/PC apps	High
Interactive Comics (E-Comics)	Digital, Android-based	High
Podcasts / Audio	Learning apps, recordings	Medium

Qualitative Insights Supporting and Enriching the Quantitative Data

The qualitative interviews provide richer context for understanding the survey results. For instance, while the survey showed that vocabulary and speaking are the most urgent needs, teachers explained how these challenges manifest in real classrooms. Mrs. Katherine described integrating English learning with project-based assignments, such as creating narrative comics in collaboration with arts and multimedia subjects. This approach allowed students to connect English with their vocational interests, making the subject less abstract and more meaningful. Students felt proud of their work, even to the point of wanting to purchase copies of the comics they created, which demonstrates how project-based learning can foster both motivation and skill development.

Similarly, both teachers underscored the importance of specific major and contextual materials. Mrs. Katherine criticized some official textbooks for including irrelevant topics, such as recipes in procedure texts, which are unsuitable for IT students. She explained that teachers often have to create or adapt materials themselves, searching online for resources that better match students' majors. Mrs. Mili added that although textbooks contain adequate technical vocabulary, the language is often too formal and not aligned with students' daily communicative needs. She suggested that materials should combine technical terms with simpler, more familiar expressions to help students transfer knowledge into practical speaking situations.

Both teachers also strongly endorsed the idea of developing interactive e-comics. Mrs. Katherine recounted her experience integrating printed comics into English lessons and noted that students found them highly effective for comprehension and engagement. According to her, comics help make abstract texts concrete and relatable, while also allowing cross-disciplinary integration. Mrs. Mili agreed, stressing that digital comics, with their colorful visuals and contextual themes,

could help motivate students and make English learning more accessible and enjoyable. She expressed hope that such media could be tailored to specific majors—Multimedia, TKJ, or RPL—so that students could clearly see the connection between English and their vocational training.

Overall, the findings demonstrate consistent themes across quantitative and qualitative data. First, vocabulary and speaking are the most pressing needs of vocational students, as both surveys and interviews emphasized. Second, motivation and engagement are frequently low due to unengaging teaching methods and irrelevant materials, but both students and teachers believe that interactive and contextual resources could address this problem. Third, students expressed strong preferences for vocationally relevant content, active tasks, and digital media, which teachers also supported as effective strategies.

In sum, the integration of student and teacher perspectives points to the urgent need for needs-based, vocationally contextualized, and digitally mediated approaches to Vocational English instruction. Innovative tools such as interactive e-comics not only align with student preferences but also address the practical and motivational challenges identified in this study.

Discussion

The findings from this study provide important insights into the perceived needs, challenges, and preferences of Indonesian vocational high school students in learning Vocational English. The results highlight that vocabulary mastery, comprehension, and motivation are the most significant challenges students face, while their preferences lean toward contextualized, digital, and interactive learning materials. Qualitative data from teacher interviews further enrich these findings, offering nuanced perspectives on how these issues manifest in classroom contexts and how instruction might be improved.

Perceived Needs and Challenges in Learning Vocational English

Addressing the first research question, the study reveals that vocabulary mastery is the most critical challenge (31% of responses). This finding extends prior vocabulary-focused research by demonstrating that vocabulary difficulty in vocational contexts is not limited to lexical knowledge, but is closely tied to task performance and professional identity formation. This finding echoes prior research emphasizing the centrality of vocabulary in second language learning [32]. Teachers such as Mrs. Katherine noted that limited vocabulary does not merely impede word recall but also affects comprehension and the acquisition of productive skills such as speaking and writing. This observation aligns with studies linking technical vocabulary mastery to broader language proficiency [33] and with evidence that vocabulary size predicts overall language success [34]. From an ESP perspective, this suggests that vocabulary instruction must be embedded within vocational tasks rather than taught as isolated lexical items.

Comprehension difficulties (24% of responses) also emerged as a major obstacle. This reinforces the notion that English instruction for vocational students must emphasize both general and discipline-specific comprehension [35]. However, the present findings suggest that comprehension problems are exacerbated when instructional materials lack contextual and visual support, particularly for learners with limited exposure to workplace discourse. Integrating authentic and vocationally relevant materials can help learners better understand the kinds of texts they will encounter in future professional settings [36].

Motivation was identified as another key challenge, with nearly one-third of students reporting low interest in English learning. Rather than treating motivation as an individual learner trait, the findings indicate that motivational issues are closely linked to instructional practices and material design. This aligns with [28] assertion that motivation strongly influences language learning engagement. The tendency toward teacher-centered, textbook-based instruction was frequently mentioned as a demotivating factor, consistent with [37] findings that monotonous lessons reduce student involvement. This underscores the need to conceptualize motivation within ESP as an outcome of meaningful task engagement and perceived relevance to learners' vocational futures.

Students' Preferences for Topics, Tasks, and Digital Media

The second research question focuses on students' preferences for learning topics, tasks, and media. The results show a clear preference for vocationally relevant content and digital-based

learning tools. These preferences highlight a shift from form-focused instruction toward use-oriented and context-driven learning, which aligns with contemporary ESP design frameworks. Students expressed greater interest in materials that reflect their study programs, such as computer and multimedia topics, supporting [38] argument for contextualized instruction. The emphasis on vocabulary (36%) and speaking tasks (22%) corresponds to workplace demands that require both technical and interpersonal communication [40]. Importantly, these preferences suggest that skills and vocabulary should be integrated rather than treated as separate instructional targets.

Students' enthusiasm for digital tools—such as YouTube videos, educational games, and interactive e-comics—mirrors global trends in technology-enhanced learning, which have been shown to improve engagement and retention [41]. However, the present study adds that digital tools are most effective when they support vocational meaning-making rather than serving purely motivational or entertainment functions. Digital learning environments not only make instruction more interactive but also align English learning with students' everyday experiences and future professional contexts [42].

Qualitative Insights Enriching Quantitative Findings

The third research question explores how qualitative data from teachers and students illuminate and support the quantitative findings. Teacher interviews provided deeper understanding of the observed patterns, revealing pedagogical constraints that cannot be captured through survey data alone. Both Mrs. Katherine and Mrs. Mili emphasized that project-based and collaborative tasks increase student motivation and engagement—confirming the quantitative results that students prefer more interactive learning modes. Their insights also reinforce [42] argument that collaborative methods enhance both motivation and language acquisition. This convergence strengthens the validity of the findings and highlights the value of mixed-methods needs analysis in ESP research.

Moreover, teachers pointed out that existing textbooks often fail to meet vocational students' linguistic and contextual needs. This underscores the need for educators to adapt or create materials that connect general English skills with vocational practices [44]. The findings suggest that without such adaptation, ESP risks reverting to generalized language instruction despite its theoretical emphasis on specificity. By integrating resources such as technical manuals, project reports, and workplace communication tasks (e.g., interviews, teamwork, documentation), teachers can bridge the gap between classroom instruction and real-world professional demands [45].

Implications for the E-Comic Design

The findings of this study have direct implications for the design and development of the Vocational English E-Comic, which was created to provide engaging, contextualized, and skill-oriented learning experiences for vocational high school students. Rather than functioning as a supplementary learning tool, the e-comic represents a pedagogical response to identified ESP needs and theoretical principles of multimodal learning. The study identified vocabulary mastery, comprehension, and motivation as the main challenges in learning English, while students expressed strong preferences for contextualized materials and digital learning media. These findings informed every aspect of the e-comic's design—its storyline, language focus, visuals, and interactive features—ensuring that it effectively addresses learners' needs and preferences. These insights guided the translation of needs analysis findings into design principles, thereby strengthening the study's contribution to ESP material development frameworks.



Figure 1. Snapshots from English E-Comic Application

1. Vocabulary-Centered and Contextual Language Use

Since vocabulary was identified as the most critical area of difficulty, each e-comic strip includes targeted word lists relevant to specific vocational majors: Computer and Network Engineering (TKJ), Film Production (PF), and Software Engineering (RPL). This design reflects an ESP-oriented view of vocabulary as functional and task-dependent rather than purely lexical. Field-specific terms such as router, reboot, firewall, rendering, debugging, and repository are introduced through natural, job-related dialogues. Each term appears in meaningful context within authentic professional scenarios—such as troubleshooting a network issue, setting up a film shoot, or debugging a program—allowing students to develop both technical and communicative competence. Short bilingual vocabulary tips reinforce understanding and retention.

2. Enhancing Comprehension through Realistic Scenarios

Comprehension difficulties are addressed through clear, task-based narrative sequences that follow a problem–solution format. This narrative structure supports cognitive processing by guiding learners through logical vocational workflows. Each scene mirrors authentic vocational practices—for example, checking network connections, preparing camera setups, or fixing code errors—helping students infer meaning from context and strengthen content-related comprehension. Reflection activities, such as writing a brief troubleshooting report or summarizing an error fix, further reinforce both comprehension and written expression skills.

3. Fostering Motivation through Interactive and Project-Based Tasks

To respond to the issue of low motivation, the e-comic incorporates interactive, student-centered activities that make learning more engaging. Motivation is thus addressed as an outcome of meaningful participation rather than external reward. Each strip features short tasks such as matching vocabulary, sequencing steps, error reporting, or directing a scene. These activities encourage students to apply language in practical and creative ways. A cross-major project—where TKJ students set up servers, PF students produce promotional videos, and RPL students develop websites—promotes authentic collaboration and integrates English use into realistic professional contexts. This design aligns with project-based and collaborative learning strategies emphasized by both students and teachers.

4. Aligning with Students' Digital Learning Preferences

Students' preference for digital and multimedia learning tools also guided the e-comic's interactive format. The multimodal integration of visuals, dialogue, and tasks reflects principles of multimodal ESP design, where meaning is constructed through multiple semiotic resources. The e-comic combines visual storytelling, dialogue-based learning, and short vocabulary games to create a dynamic, learner-friendly digital experience. The online accessibility allows for self-paced study, repetition, and autonomous learning, while maintaining the visual appeal and entertainment value that motivate students to learn English through familiar digital platforms.

5. Integrating Teachers' Pedagogical Insights

Teacher feedback further shaped the pedagogical design of the e-comic. By embedding teacher-guided prompts and communicative tasks, the e-comic supports flexible classroom implementation rather than replacing teacher mediation. Classroom prompts and discussion questions are embedded in the materials to help teachers integrate the e-comic into communicative and task-based English lessons. The natural dialogues and field-relevant vocabulary enable role-plays, presentations, and collaborative projects that connect general English learning with students' vocational expertise.

V. Conclusion

This study explored the perceived needs, challenges, and learning preferences of vocational high school students in learning Vocational English, with a particular focus on digital-based resources.

The findings reveal that students face major challenges in vocabulary mastery, comprehension, and maintaining motivation in traditional classroom contexts. At the same time, they express a strong preference for contextualized, vocationally relevant, and interactive materials that connect English learning to their field of study.

Quantitative data from the Vocational English Needs Analysis Questionnaire (VENAQ), supported by qualitative insights from teacher interviews, highlight the importance of tailoring English instruction to the specific linguistic and professional demands of different vocational programs. Students in Computer and Network Engineering (TKJ), Film Production (PF), and Software Engineering (RPL) all demonstrate the need for practical, communication-oriented English instruction that integrates technical vocabulary and authentic work-related tasks. Teachers also emphasize the necessity of moving beyond textbook-based approaches toward more engaging, task-based, and project-oriented learning experiences.

In response to these findings, the Vocational English E-Comic was designed as a digital learning medium that integrates field-specific vocabulary, real-world communication scenarios, and interactive learning activities. The e-comic contextualizes English learning within the students' vocational fields, promotes comprehension through visual and situational cues, and enhances motivation through project-based and collaborative activities. It demonstrates how digital media can serve as an effective bridge between language learning and vocational skill development.

Overall, this study contributes to the growing body of research on English for Specific Purposes (ESP) in vocational education by emphasizing the importance of culturally and professionally relevant instructional design. The development of the e-comic represents a practical application of the study's findings, showing how data-driven instructional innovation can enhance both engagement and learning outcomes. Future studies may further evaluate the e-comic's effectiveness in improving students' English performance and explore its adaptability across different vocational disciplines.

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Appendices

Appendix 1. the Questionnaire

Vocational English Needs Analysis Questionnaire (VENAQ)

Tujuan:

Mengetahui kebutuhan belajar, tantangan, serta preferensi siswa SMK dalam pembelajaran Bahasa Inggris vokasional berbasis teknologi digital.

Dengan mengisi kuesioner ini, Anda setuju untuk berpartisipasi secara sukarela dalam penelitian mengenai kebutuhan, tantangan, dan preferensi siswa SMK dalam pembelajaran Bahasa Inggris vokasional berbasis digital. Seluruh jawaban bersifat anonim dan hanya akan digunakan untuk kepentingan penelitian sesuai dengan prinsip etika akademik.

Bagian 1: Identitas Responden

1. Nama : _____
2. Jenis kelamin: ☐ Laki-laki ☐ Perempuan
3. Jurusan: ☐ Multimedia ☐ Teknik Komputer dan Jaringan (TKJ)
4. Kelas: ☐ X ☐ XI ☐ XII

Bagian 2:

A. Eksplorasi Kualitatif

1. Kesulitan apa yang pernah Anda alami saat menggunakan Bahasa Inggris di jurusan?

2. Jika Anda bisa memilih satu topik Bahasa Inggris untuk dipelajari, apa itu dan mengapa?

3. Menurut Anda, apa kekurangan pembelajaran Bahasa Inggris di sekolah saat ini?

4. Apa jenis tugas atau proyek Bahasa Inggris yang Anda sukai?

5. Bagaimana pendapat Anda tentang penggunaan e-comic dalam pelajaran Bahasa Inggris?

Bagian 3: Kuesioner

Silakan berikan penilaian Anda terhadap pernyataan-pernyataan berikut dengan memilih salah satu jawaban pada skala 1 sampai 5, di mana:

1 = Sangat Tidak Setuju (STS), 2 = Tidak Setuju (TS),

3 = Netral (N),

4 = Setuju (S), 5 = Sangat Setuju (SS).

NO	PERNYATAAN	STS	TS	N	S	SS
		1	2	3	4	5
1.	Bahasa Inggris penting untuk masa depan karier saya.					
2.	Saya merasa Bahasa Inggris berguna untuk bidang keahlian saya.					
3.	Saya sering membutuhkan Bahasa Inggris dalam kegiatan belajar di jurusan saya.					
4.	Saya merasa percaya diri saat menggunakan Bahasa Inggris.					
5.	Guru saya sering mengaitkan pelajaran Bahasa Inggris dengan dunia kerja.					
6.	Saya merasa motivasi saya meningkat jika belajar Bahasa Inggris yang relevan.					
7.	Saya lebih tertarik belajar Bahasa Inggris jika menggunakan media visual.					

8.	Saya menyukai pembelajaran Bahasa Inggris berbasis teknologi digital.					
9.	Saya ingin belajar Bahasa Inggris melalui aplikasi komik digital interaktif.					
10.	Saya akan lebih termotivasi jika media pembelajaran sesuai dengan jurusan saya.					
11.	Saya merasa belajar dengan media digital lebih menyenangkan.					
12.	Saya merasa media digital dapat membantu saya memahami Bahasa Inggris lebih cepat.					

Silakan nilai tingkat kesulitan Anda dalam hal-hal berikut dengan memilih angka pada skala 1 sampai 5, di mana:

1 = Sangat Sulit dan 5 = Sangat Mudah.

NO	PERNYATAAN	SANGAT SULIT	SULIT	SEDANG	MUDAH	SANGAT MUDAH
		1	2	3	4	5
13.	Membaca dan memahami teks manual atau instruksi teknis dalam Bahasa Inggris.					
14.	Mendengarkan dan memahami instruksi kerja berbahasa Inggris.					
15.	Menulis laporan atau proposal proyek sederhana dalam Bahasa Inggris.					
16.	Menyampaikan presentasi atau penjelasan proyek secara lisan.					
17.	Berbicara dengan klien atau kolega asing menggunakan Bahasa Inggris.					
18.	Menjawab pertanyaan wawancara kerja dengan Bahasa Inggris.					

B. 19. Apa Kebutuhan Topik Bahasa Inggris Anda? (Bisa memilih lebih dari satu)

- ☐ Membaca instruksi teknis perangkat dan tools.
- ☐ Menulis proposal atau laporan proyek.
- ☐ Melakukan presentasi dan menjelaskan proyek multimedia atau jaringan.
- ☐ Istilah teknis dalam desain grafis / jaringan komputer.
- ☐ Bahasa untuk wawancara kerja dan pengenalan profesional.
- ☐ Bahasa kerja sama dalam tim proyek atau saat PKL.

C. 20. Media Pembelajaran Apa yang Anda Sukai? (Bisa memilih lebih dari satu)

- ☐ Buku teks (cetak).
- ☐ Video pembelajaran (YouTube, TikTok Edu, dll).
- ☐ Game edukatif berbasis aplikasi.
- ☐ Komik digital interaktif.
- ☐ Podcast atau audio belajar.
- ☐ Modul interaktif seperti Quizizz atau Google Form.

Appendix 2. Teacher's Interview Guide

Instrumen Wawancara (Semi-structured, untuk Guru Bahasa Inggris SMK)

Tujuan: Menggali kebutuhan Bahasa Inggris siswa berdasarkan pengalaman guru dalam pembelajaran.

Identitas Responden:

- Nama:
- Jabatan:
- Lama mengajar:
- Jurusan yang diajar:

Pertanyaan Wawancara:

1. Menurut Bapak/Ibu, keterampilan bahasa Inggris apa yang paling penting untuk dikuasai siswa jurusan Multimedia/RPL/PF?
2. Dalam situasi apa saja biasanya siswa jurusan ini paling membutuhkan kemampuan berbahasa Inggris (misalnya membaca manual, presentasi, komunikasi daring)?
3. Bagaimana menurut Bapak/Ibu kecukupan kosakata teknis (technical vocabulary) yang ada dalam buku atau bahan ajar saat ini?
4. Apakah buku teks yang digunakan sekarang sudah cukup mempersiapkan siswa untuk kebutuhan kerja di bidang Multimedia/RPL/PF?
5. Media atau metode apa yang paling efektif menurut Bapak/Ibu dalam mengajarkan bahasa Inggris di jurusan ini?
6. Bagaimana peran teknologi (misalnya aplikasi, video, atau e-comic) dalam mendukung pembelajaran bahasa Inggris di kelas?
7. Apa harapan Bapak/Ibu terhadap penggunaan media digital seperti e-comic dalam pembelajaran bahasa Inggris?
8. Kesulitan apa yang paling sering dialami siswa dalam belajar bahasa Inggris, berdasarkan pengalaman Bapak/Ibu mengajar?
9. Menurut Bapak/Ibu, faktor utama apa yang membuat siswa kurang termotivasi dalam belajar bahasa Inggris, dan bagaimana solusinya?
10. Apa masukan Bapak/Ibu untuk pengembangan bahan ajar atau media baru agar lebih sesuai dengan kebutuhan siswa jurusan?

Appendix 3

Samples of Vocational English e-comic: Strip 2 – The Network Rescue Mission





