

# NEEDS ANALYSIS AND IMPLEMENTATION OF THE ENGLISH CURRICULUM IN AUTOMOTIVE ENGINEERING: AN ESP PERSPECTIVE IN MALANG

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**Abstract:** This study investigates the English language needs of automotive engineering students within the framework of English for Specific Purposes (ESP). Using a qualitative descriptive approach, the research evaluated the alignment between the theoretical language requirements and the implementation of the ESP curriculum at a reputable university in Malang. Data were collected through a literature review, semi-structured interviews with lecturers, and analysis of curriculum documents. The findings reveal that while the curriculum covers fundamental skills such as reading, writing, and technical vocabulary, it lacks sufficient emphasis on speaking skills, industry-specific materials, and interactive learning approaches. These gaps hinder students' preparedness for effective English communication in professional automotive settings. To enhance the relevance and effectiveness of ESP instruction, this study recommends curriculum improvements that integrate speaking skills, incorporate industry-based content, and foster collaboration with the automotive sector.

**Keywords:** Automotive Engineering, English for Specific Purposes, Need Analysis.

In today's globalized automotive industry, effective communication in English has become a crucial skill for professionals in the field. Automotive engineering students require specialized English proficiency to comprehend technical documents, collaborate with international teams, and present engineering concepts effectively. However, traditional university English courses often focus on general language skills, such as reading, speaking, and grammar, rather than the specific linguistic demands of engineering contexts (Lestari et al., 2017). This misalignment between curriculum content and professional needs creates a significant challenge for students preparing to enter the workforce (Gholaminejad, 2021).

English for Specific Purposes (ESP) plays a vital role in bridging this gap by tailoring language instruction to the demands of specific fields, including automotive engineering (Basturkmen, 2010). Unlike conventional English language courses, ESP emphasizes the development of specialized vocabulary, technical writing, and industry-specific communication skills essential for engineering professionals (Hutchinson & Waters, 1987). Given that automotive engineering is a highly practical discipline with a strong emphasis on hands-on learning, English instruction in this field must be designed to enhance students' ability to engage with technical manuals, research publications, and workplace interactions. However, many undergraduate ESP programs still prioritize general English skills or standardized test preparation—such as TOEFL training—over industry-relevant competencies. This is evident in the curriculum at a reputable university in Malang, where automotive engineering students primarily receive instruction in reading and grammar, rather than the applied communication skills they will need in professional settings.

Despite the growing recognition of ESP's importance, there remains a substantial gap between the theoretical needs of engineering students and the actual implementation of ESP curricula (Azmi et al., 2018; Alhamami, 2022). Research has consistently shown that engineering graduates struggle with essential language skills, such as writing technical reports, interpreting specialized literature, and engaging in professional discussions (Wade et al., 2022; Spoelstra, 2023). However, most existing studies have focused on general engineering needs rather than specifically evaluating ESP implementation in the automotive engineering field (Rindfleisch et al., 2011; Garay & Reyes, 2019). Furthermore, there has been no direct evaluation of how ESP is applied at this particular university in Malang, leaving a crucial gap in understanding whether current curricula align with the real-world linguistic demands of the field.

To address this issue, this study aims to analyze the alignment between theoretical ESP needs and the actual implementation of ESP courses in the Automotive Engineering department at this university. By conducting a needs analysis, this research will assess the extent to which current teaching methods, materials, and assessments meet students' professional language requirements. The findings will serve as a foundation for designing a more effective ESP curriculum, integrating industry-specific content, practical speaking skills, and interactive learning approaches. Ultimately, this study seeks to enhance the preparedness of automotive

engineering students, ensuring they are equipped with the English proficiency necessary to excel in both academic and professional environments (Shanmugam, 2023; Sanmugam & Shamsudin, 2017; Poedjiastutie & Syafinaz, 2021).

## **METHOD**

This study uses a qualitative descriptive approach to describe the phenomena, patterns, and practices that occur in the context of automotive engineering education. The purpose of this study is to describe and compare the theoretical needs and implementation of automotive engineering education at University A (pseudonym) in Malang, East Java. Data were collected through three main methods: literature review, semi-structured interviews, and documentation. The literature review collects theoretical data on the needs of automotive engineering English from various sources, such as books, scientific articles, and previous studies. The purpose of the literature review is to gain a theoretical understanding of the needs of English in automotive engineering. In addition, empirical data were collected through semi-structured interviews with two lecturers at University A, specialized in automotive engineering. These lecturers were selected based on their expertise and experience in teaching automotive engineering in English. The focus of this semi-structured interview was to examine the elements needed in teaching English, such as learning objectives, teaching techniques, and problems faced. In addition, an analysis of the RPS document for teaching English in Automotive Engineering was also carried out.

The instruments used in this study include a literature review guide, an interview guide, and a Document Analysis checklist. The literature review guide contains criteria for selecting relevant sources, such as appropriate topics, publication quality, and relevance to automotive engineering English needs. Meanwhile, the interview guide is designed with a list of questions to explore English teaching practices in automotive engineering education. Document analysis is used to confirm the interview results with what is applied. The data obtained from these three methods are analyzed through several stages. The first stage is data reduction, where relevant data is selected and summarized to focus on automotive engineering English needs. Furthermore, the summarized data is presented in a descriptive form to describe the theoretical English needs and their teaching practices at University A. The next stage is to compare theoretical data from the literature review with empirical data from the interview results to identify gaps between theory and practice. Finally, conclusions are drawn based on the comparison to provide recommendations related to the curriculum and teaching of English in automotive engineering education. Through this analysis, it is hoped that a deeper understanding of the automotive engineering English needs can be found, both from theoretical and practical perspectives. The results of this study are also expected to be a reference in developing a curriculum that is more relevant and following the needs of students in the field of automotive engineering education.

## **FINDINGS**

Findings regarding the need of English language material and skills that should be given to automotive engineering students theoretically as can be seen in Table 1 below.

Table 1. English language material and skills that should be given to automotive engineering students

<b>Aspects</b>	<b>Findings</b>	<b>Sources</b>
Writing Skills	Technical report writing, completing work orders, and documenting industrial practice.	Lestari & Priyana, 2020
Reading Skills	Understanding technical documents and manuals.	Wijayanti & Nugroho, 2021
Speaking Skills	Communication with clients and colleagues.	Wijayanti & Nugroho, 2021
Vocabulary	Mastery of technical terminology related to the automotive field.	Lestari & Priyana, 2020
Textbooks and Resources	Textbooks and learning resources focused on automotive terminology and practical applications.	Lestari & Priyana, 2020
Materials for Writing Practice	Work orders, technical reports, and industrial documentation for writing practice.	Lestari & Priyana, 2020

Resources for Oral Communication	Presentation and discussion-based activities to enhance oral communication skills.	Poedjiastutie, 2019; Sasabone et al., 2021
Customized Materials	Materials aligned with industry needs and tailored for automotive contexts.	Jaya, 2023

Research shows that automotive engineering students need specific English language skills to support their professional tasks, including the ability to write reports, understand technical documents, and communicate with clients and colleagues in English (Wijayanti & Nugroho, 2021; Lestari & Priyana, 2020). A study by Wijayanti and Nugroho emphasized that automotive engineering students need more focused instruction on English language skills relevant to their field, such as understanding technical terms and the ability to write work reports (Wijayanti & Nugroho, 2021). This is in line with Puspitaloka's findings which show that teaching materials in vocational schools often do not match industry needs, so there needs to be development of materials that are more relevant to the automotive context (Puspitaloka, 2024). These skills are very important because students will often interact with technical documents and reports that require a good understanding of English. Furthermore, research by Lestari and Priyana shows that students majoring in automotive engineering need writing skills that include filling out and completing work orders and industrial work practice reports (Lestari & Priyana, 2020). These skills must be supported by appropriate teaching materials, such as textbooks and resources that focus on terminology and practices in the automotive industry (Lestari & Priyana, 2020). In this case, the development of teaching materials that are oriented towards communication skills, such as oral presentations and discussions, is also very necessary to prepare students to face challenges in the workplace (Poedjiastutie, 2019; Sasabone et al., 2021).

Kumaran emphasized that educational programs in universities must be adjusted to the needs of the automotive industry, including the English language skills needed to communicate effectively in the workplace (Alqahtani, 2015). Thus, the ESP curriculum designed for automotive engineering students should include an in-depth needs analysis to determine the most needed language skills, as well as the development of appropriate teaching materials (Jaya, 2023). Research by Jaya also shows the importance of needs analysis in ESP teaching in vocational schools, which suggests that English language teaching should be tailored to the specific goals of students in automotive engineering (Jaya, 2023). Overall, the need for English language skills in the automotive engineering context covers a wide range of aspects, from oral and written communication skills to understanding relevant technical terms. Therefore, it is important for educational institutions to develop curricula that are responsive to industry needs and provide students with the skills needed to succeed in their careers in the automotive field.

Findings regarding what has been achieved in the English language material and skills provided to automotive engineering students, as can be seen in Table 2 below.

Table 2. English language material and skills that are given to automotive engineering students

Aspects	Findings	Sources
Pronouns	Identifying nouns (subjects and objects), underlining adjective + noun combinations, completing sentences using subject and object pronouns, and understanding singular, plural, and irregular plural forms.	Engineering English Curriculum and Interview
Participles	Underlining past participles, distinguishing present and past participles, and classifying participles in different grammatical contexts (e.g., modifiers, adjuncts).	Engineering English Curriculum and Interview
Vocabulary Practices for Engineering	Learning technical vocabulary related to maintenance, lubrication, engine cooling, fuel system, ignition system, starting system, and charging system.	Engineering English Curriculum and Interview

Passives	Identifying passive forms (e.g., is done/was done), rewriting sentences in different passive forms, and constructing passive sentences using alternative structures.	Engineering English Curriculum and Interview
Conjunctions and Clauses	Completing sentences with conjunctions (e.g., and, but, or, while), transforming noun clauses with question words, and combining sentences with adjective clauses.	Engineering English Curriculum and Interview
Reading Techniques	Reading and translating international proceedings and journals to improve understanding of technical English texts.	Engineering English Curriculum and Interview
Reading Practices	Reading manuals for systems like maintenance, engine lubrication, fuel system, and charging system, and identifying relevant vocabulary from these texts.	Engineering English Curriculum and Interview

The analysis results from Table 2 show that the implementation of the Engineering English curriculum at the university includes basic skills that are relevant to the needs of automotive engineering students. One important aspect taught is basic grammar, including the use of pronouns. According to Lecturer 1 (T1), *“Usually we start from basic grammar first, such as subject and object pronouns. It is very important for students to understand technical sentence structures.”* A similar thing was conveyed by Lecturer 2 (T2), who said, *“Yes, this basic grammar must be mastered first. If they don’t understand it, their technical reports can be messy.”* In addition to grammar, participles are also a focus in the curriculum. T1 explained, *“We teach students about present and past participles. This often appears in technical manuals, so they must be able to differentiate and use them in the right context.”* T2 added, *“Yes, participles are an important part, especially if they will work in the automotive industry later. Many technical documents use them.”*

Mastering technical vocabulary is also a priority. T1 said, *“Our students are taught a lot of technical terms, such as lubrication systems, fuel, and engine cooling. They need to know this to read manuals or explain work procedures.”* T2 added, *“This vocabulary training is very important because in the industry they will often find terms like that.”* In terms of sentence structure, the passive form is also taught well. T1 said, *“We teach students to use the passive form, such as ‘is replaced’ or ‘was inspected’. Because, technical reports usually use the passive structure to be more formal.”* T2 emphasized, *“That’s right, in the internship report, students are required to use the passive form to look professional.”* The curriculum also includes teaching conjunctions and clauses to help students build more complex sentences. T1 explained, *“We teach them how to use conjunctions like ‘and’, ‘but’, or ‘while’ to provide clearer technical information.”* T2 added, *“Adjective clauses are also taught, so they can be more detailed when explaining vehicle components.”*

In reading skills, students are trained to read quickly and understand technical texts. T1 said, *“Usually we give texts from international journals or technical manuals so they can learn directly from relevant sources.”* T2 added, *“We focus our reading materials on documents that are often used in the workplace, such as repair reports or vehicle manuals.”* Authentic materials are also used in teaching to make students closer to the industrial context. T1 said, *“We use original vehicle manuals and technical documents to give them a real picture of the world of work.”* T2 emphasized, *“With materials like that, students not only learn the language, but also gain insight into what they will face in the field.”*

These results indicate that the curriculum at University A has covered many aspects that support the basic needs of automotive engineering students. However, there is still room to improve the integration of speaking skills and the use of industrial case studies to make learning more relevant to their professional needs in the workplace.

## DISCUSSION

The findings in Table 1 and Table 2 show several things that match between the theoretical needs of English language skills for automotive engineering students and the materials and English language skills taught at the university. First, in terms of writing skills, Table 1 highlights the importance of the ability to write technical reports, complete work orders, and document industrial practices (Lestari & Priyana, 2020). This is

in line with Table 2, where the curriculum at the university includes tasks such as writing sentences in passive voice, rewriting technical phrases, and completing sentences using subject and object pronouns. These exercises indicate that students are trained in essential grammar and sentence structures to support their technical writing skills according to professional needs. Second, the reading skills mentioned in Table 1 emphasize understanding technical documents and manuals (Wijayanti & Nugroho, 2021). This is reflected in Table 2, where the curriculum includes reading materials such as manuals for maintenance, lubrication, and fuel systems. In addition, students are also required to read and translate international journals and proceedings, which helps them develop comprehension skills that are essential for their roles in the automotive industry. Third, Table 1 highlights the importance of speaking skills to communicate with clients and colleagues (Wijayanti & Nugroho, 2021). Although Table 2 focuses more on written English skills, the curriculum supports verbal communication indirectly through vocabulary mastery and grammar exercises. For example, vocabulary exercises for terms such as “ignition system” and “engine cooling system” prepare students to deliver technical information effectively.

Fourth, vocabulary mastery in technical terminology is essential, as shown in both tables. Table 1 emphasizes the need to understand technical terms related to automotive systems (Lestari & Priyana, 2020), while Table 2 includes vocabulary exercises targeting systems such as lubrication, fuel, and charging. This alignment ensures that students are familiar with the terminology they will encounter in technical documents and workplace communications. Finally, Table 1 emphasizes the need for relevant teaching materials, such as textbooks and resources tailored to automotive terminology and practical applications (Lestari & Priyana, 2020). Table 2 supports this by describing the specific materials used in the curriculum, such as manuals and international journals. These materials not only enhance students’ language skills but also introduce them to authentic contexts, bridging the gap between academic learning and professional application.

The alignment between the theoretical needs described in Table 1 and the practical implementation in Table 2 confirms that the English curriculum is relevant at the university for automotive engineering students in several aspects. The combination of targeted English language skills training and industry-relevant materials ensures that students are well-prepared to meet the demands of the academic and professional environment in the automotive field. Although the theoretical needs (Table 1) and the curriculum implementation (Table 2) are largely aligned, certain areas still show discrepancies. One major inconsistency is the lack of integration of speaking skills in the curriculum. Table 1 shows that speaking skills, especially for communication with clients and colleagues, are very important in the automotive engineering workplace (Wijayanti & Nugroho, 2021). However, Table 2 shows that the curriculum focuses more on reading and writing skills, without specific activities to practice speaking skills, such as presentations, group discussions, or technical communication simulations. This makes students less trained to deal with verbal communication situations in the work environment.

In addition, there is a gap in materials that support verbal communication. Table 1 highlights the importance of learning materials that can support speaking skills, such as materials for presentation exercises or technical-based discussions (Poedjiastutie, 2019; Sasabone et al., 2021). However, Table 2 only includes technical vocabulary and grammar exercises without providing specific materials for speaking skills. As a result, students do not get enough opportunities to practice verbal communication in contexts that are relevant to their profession. Another gap is the lack of focus on in-depth technical report writing training. Table 1 shows that technical report writing skills, such as work reports or project documents, are crucial for automotive engineering students (Lestari & Priyana, 2020). However, Table 2 covers more basic exercises, such as completing sentences with passive forms or pronouns, which are insufficient to train students to produce complex technical reports that follow their professional needs.

Another significant difference is the limited industry-based teaching materials. Table 1 highlights the need for learning materials that are relevant to the needs of the automotive industry, such as real-world work-based case studies (Puspitaloka, 2024; Jaya, 2023). While Table 2 includes materials such as technical manuals and international journals, there is no indication of the use of case studies to simulate real-world work challenges. This reduces the relevance of the learning materials to the automotive workplace. Finally, the learning approaches used in the curriculum are also less interactive and practical.

Table 1 emphasizes the need for interactive learning approaches, such as simulations and collaboration in groups (Wijayanti & Nugroho, 2021). However, Table 2 uses more text-based approaches without mentioning any simulations of real-world work situations or collaboration between students. This approach makes learning less dynamic and less able to support the mastery of skills needed in the workplace. Overall, these discrepancies indicate that although the Engineering English curriculum at Universitas Negeri Malang already covers many aspects of basic skills, further development is needed. Adding a focus on speaking skills, industry-based materials, and interactive learning approaches can help ensure that automotive engineering students are better prepared to face the challenges and demands of the workplace.

In the context of automotive engineering, specific English language needs may differ from other engineering study programs. For example, automotive engineering students need to be able to write reports related to vehicle repairs, order spare parts, and communicate with customers (Shanmugam, 2023; Sanmugam & Shamsudin, 2017). In addition, they also need to understand technical terms in English related to vehicle components (Poedjiastutie & Syafinaz, 2021). Therefore, the ESP approach is very relevant to be applied in English language learning for automotive engineering students. Unlike general English language learning, ESP focuses on specific English language needs according to certain fields of study and professions (Moiinvaziri, 2014; Hadiani & Permata, 2017). By understanding the specific English language needs of automotive engineering students, it is hoped that they can improve their readiness to face the challenges of English communication in academic and professional environments (Umar, 2023; Chen, 2023).

However, the implementation of ESP in engineering education environments also faces several challenges. One of them is the lack of understanding and skills of teachers in designing and teaching ESP materials that are appropriate to students' needs (Jaya, 2023; Poedjiastutie, 2019). In addition, there are challenges related to the provision of learning resources and teaching materials that are relevant to the specific English language needs of automotive engineering students (Woźniak, 2017; Zahedpisheh et al., 2017). Therefore, comprehensive efforts are needed to develop ESP-based English learning that is appropriate to the needs of automotive engineering students. This can be done through in-depth needs analysis, a collaboration between English teachers and automotive engineering lecturers, and the development of relevant teaching materials and learning resources (Hadiani & Permata, 2017; Lestari & Priyana, 2020). Thus, it is hoped that automotive engineering students can acquire English language skills that are in accordance with their academic and professional demands (Umar, 2023; Chen, 2023). Therefore, when creating a syllabus, Holme (1996) suggests that teachers should not isolate a single language unit from its context and teach only that part to students. A holistic approach remains important in developing an English syllabus for vocational education. The main emphasis of a language syllabus in vocational education should be on needs analysis, text analysis, and preparing students to communicate effectively in their work environment (Dudley-Evans & St John, 1998).

## **CONCLUSION AND RECOMMENDATION**

This study revealed that the English curriculum for automotive engineering at the university has covered basic skills such as reading, writing, and mastery of technical vocabulary, but there are still gaps in speaking skills, industry-based materials, and interactive learning approaches. This mismatch can affect the readiness of automotive engineering students to face the challenges of English communication in the workplace. The results of the study indicate the need for curriculum evaluation to better meet the professional needs of automotive engineering students. However, this study is limited to official curriculum data and lecturer interviews, so it does not fully cover the perspectives of students or the context of other universities. For Universitas Negeri Malang, it is recommended to integrate speaking skills into the curriculum through simulations and technical discussions, provide industry-based materials, and adopt interactive learning approaches. In addition, collaboration with the automotive industry can help adjust the curriculum to the needs of the workplace. For further research, it is recommended to involve students' views, conduct comparative studies, develop ESP-based teaching materials, and evaluate the impact of the curriculum on student readiness. With these steps, it is hoped that the curriculum can be more relevant and support student success in the professional world.

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