



Bridging the Gap: The Need for a Specialized English Curriculum for Mechanical Engineering Students at ENSEM Engineering School, Hassan II University

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Abstract: The "Business English and Soft Skills" course at ENSEM Engineering school, Hassan II University aims to enhance general language proficiency but fails to meet the specific linguistic needs of mechanical engineering students. This study identifies a critical gap in the curriculum, which prioritizes business communication and soft skills while overlooking technical vocabulary, genre-specific communication, and technical writing essential for engineering contexts. Through a mixed-methods approach combining content analysis, teaching observations, and needs assessment, this research highlights the misalignment between the course objectives and the professional demands of mechanical engineering. The findings underscore the necessity of a specialized English for Specific Purposes (ESP) curriculum tailored to engineering students, focusing on technical vocabulary, precise writing, and effective oral communication in technical contexts. The study advocates for adopting a genre-based pedagogical approach to bridge this gap, equipping ENSEM graduates with the linguistic competencies required to excel in the global engineering industry.

Keywords: ESP & Genre-Based Pedagogy, Mechanical Engineering, Curriculum Development, Professional Communication.

1. Introduction

The existing English curriculum at ENSEM Hassan II University, particularly the "Business English and Soft Skills" course, is primarily designed to enhance general English language proficiency and develop essential soft skills. The course emphasizes foundational aspects such as grammar, vocabulary, and general communication, with a focus on contexts like business communication and professional interactions. For instance, students are trained in grammar topics like modals, passive voice, and relative clauses, and vocabulary related to general themes such as work, culture, and education (ENSEM, 2024). Additionally, the course includes modules on soft skills, covering teamwork, conflict resolution, and public speaking—key competencies for professional success in various business environments.

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However, a critical gap exists between the course content and the specific linguistic needs of mechanical engineering students. The course does not provide specialized instruction in technical vocabulary or genre-specific communication skills, which are crucial for students who will be working in highly technical fields such as mechanical engineering. As Belcher (2009) points out, "English for Specific Purposes (ESP) courses must be tailored to the particular genres and discourse practices of the students' future professions to be truly effective" (p. 3).

2. Literature Review

The integration of English for Specific Purposes (ESP) into technical disciplines such as mechanical engineering has become increasingly essential in a globalized economy where English is the lingua franca of science and technology. ESP, as defined by Hutchinson and Waters (1987), is an approach to language teaching in which "all decisions as to content and method are based on the learner's reason for learning" (p. 19). This tailored approach to language instruction is particularly important for mechanical engineering students, whose professional success depends on their ability to comprehend and produce technical documents, communicate technical information clearly, and engage in specialized discourse practices. The significance of ESP in technical education has been widely recognized in the literature; with scholars such as Hyland (2006), emphasizing the role of ESP in equipping students with the language skills necessary to function effectively in their specific fields (p. 32). Despite the importance of ESP, many English curricula, including the "Business English and Soft Skills" course at ENSEM Hassan II University, remain focused on general language skills, leaving a significant gap in the preparation of students for their future careers.

The "Business English and Soft Skills" course at ENSEM is designed to enhance general English language proficiency and develop soft skills such as teamwork, communication, and public speaking, which are valuable in various professional contexts. The course emphasizes foundational aspects of language learning, including grammar, vocabulary, and general communication skills, with a particular focus on business environments (ENSEM, 2024, p. 1). However, while these elements are essential for a well-rounded education, they do not align with the specific linguistic needs of mechanical engineering students. For instance, the course includes grammar lessons on topics such as modals, passive voice, and relative clauses, and vocabulary exercises related to general themes such as work, culture, and education (ENSEM, 2024, p. 3). These topics, while important, do not provide the specialized vocabulary or genre-specific communication skills necessary for success in the engineering field. Basturkmen (2010) argues that "effective ESP instruction requires a shift from general language skills to more specialized language use, tailored to the specific needs of learners" (p. 45), a shift that the current curriculum at ENSEM fails to achieve.

One of the critical shortcomings of the current curriculum is its lack of focus on technical vocabulary acquisition. Mechanical engineering students must master a specialized lexicon related to materials, processes, machinery, and systems to effectively engage with technical documents and communicate in their field. Without this foundational knowledge, students are likely to struggle with the complex language they will encounter in professional contexts. As Belcher (2009) emphasizes, "ESP courses must be tailored to the particular genres and discourse practices of the students' future professions to be truly effective" (p. 3). The absence of focused vocabulary instruction in the "Business English and Soft Skills" course leaves students underprepared for the linguistic demands of their profession, highlighting a significant gap in the curriculum. Furthermore, Anthony (2018) notes that

"technical vocabulary is a critical component of ESP, and its effective acquisition is essential for students to perform competently in their professional domains" (p. 27).

In addition to vocabulary acquisition, the curriculum's failure to incorporate genre-specific communication and technical writing instruction further exacerbates the problem. Mechanical engineers are required to write technical reports, research papers, and project documentation, all of which demand a high level of precision, clarity, and adherence to specific genre conventions. As Hyland (2004) notes, genre-based approaches in ESP are essential because they "help students understand the ways language functions in different professional contexts" (p. 24). The current curriculum's focus on general business writing tasks, such as writing reports and conducting SWOT analyses, does not align with the specific writing needs of engineers. This misalignment means that students may struggle to produce the detailed and precise documentation required in their field, further limiting their professional effectiveness. Johns (2011) supports this view, stating that "genre knowledge is crucial for students to succeed in their disciplinary writing tasks, and ESP courses must integrate this knowledge into their curriculum" (p. 98).

Oral communication is another area where the current curriculum falls short. Mechanical engineers must be able to present technical information clearly and concisely to both specialist and non-specialist audiences, often using visual aids, technical descriptions, and data interpretation. The "Business English and Soft Skills" course emphasizes general business communication skills, such as delivering presentations and participating in role-plays, but does not provide the specialized training needed for effective communication in technical contexts. As Hyland (2007) argues, "Genre-based pedagogy not only equips students with the tools they need to participate in their chosen professions but also helps them understand how language functions within those professions" (p. 152). Without such specialized training, engineering students may be at a disadvantage when it comes to communicating their ideas and findings in professional settings, which could impede their ability to collaborate on projects and present their work to stakeholders. Similarly, Paltridge (2013) notes that "the ability to adapt communication styles to suit different audiences is a key skill for professionals, and ESP courses should emphasize this adaptability" (p. 60).

Furthermore, the curriculum does not sufficiently address the reading and comprehension of technical texts, which is a critical skill for mechanical engineers. These students must be able to interpret complex technical documents such as manuals, specifications, schematics, and research articles. The ability to read and understand these texts is essential for successful professional practice, as it allows engineers to apply the information contained in these documents to their work. However, the current curriculum at ENSEM does not provide targeted instruction in these areas, leaving students underprepared for the challenges they will face in their careers. According to Hyland (2004), "Reading comprehension is a critical skill in ESP, as it enables students to access and interpret the specialized texts they will encounter in their professional lives" (p. 30). In addition, Swales (1990) highlights the importance of discourse analysis in ESP, noting that "understanding the structure and purpose of specialized texts is crucial for students to engage meaningfully with their professional literature" (p. 84).

The gaps identified in the current curriculum have significant implications for the professional readiness of mechanical engineering students at ENSEM. Without specialized instruction in technical vocabulary, genre-specific communication, and technical writing, students are likely to struggle with the linguistic demands of their profession. This lack of preparation can hinder their ability to fully

engage with technical materials, communicate effectively in professional settings, and contribute meaningfully to engineering projects. Moreover, the misalignment between the curriculum and the students' professional needs could lead to frustration and disengagement, as students may perceive the content they are learning as irrelevant to their future careers. According to Dudley-Evans and St John (1998), "The effectiveness of an ESP course is measured by its relevance to the learners' immediate and future professional needs, and a mismatch in this area can significantly impact student motivation and engagement" (p. 79).

To address these issues, there is a clear need for a specialized English course tailored to the needs of mechanical engineering students at ENSEM. This course should integrate genre-based approaches to ESP, focusing on the specific communicative tasks and language used in mechanical engineering. By incorporating instruction in technical vocabulary, technical writing, oral communication, and reading comprehension of technical texts, the proposed course would better prepare students for the challenges of their future careers. As Hutchinson and Waters (1987) note, "The success of an ESP course depends on its ability to meet the specific needs of its learners, which requires a deep understanding of the language used in their professional contexts" (p. 19). Additionally, Robinson (1991) emphasizes that "a needs analysis is critical in designing ESP courses, as it ensures that the course content is directly relevant to the learners' professional goals" (p. 28).

Overall, the literature highlights the importance of a specialized English curriculum for mechanical engineering students at ENSEM Hassan II University. The current "Business English and Soft Skills" course, while valuable for general language development, does not address the specific linguistic needs of students preparing for careers in a technical field. A curriculum that integrates genre-based approaches to ESP, focusing on technical vocabulary, writing skills, oral communication, and reading comprehension in technical contexts, would better equip students for the challenges of their future careers. By aligning language instruction with the specific demands of the engineering profession, ENSEM can ensure that its graduates are well-prepared to succeed in a globalized and highly technical industry.

3. Current Course Description: "Business English and Soft Skills"

The "Business English and Soft Skills" course at ENSEM is structured to cover general language skills with a strong emphasis on business contexts. According to the course description, the primary goal is to "consolidate linguistic competencies in English and French while supporting personal and professional development" (ENSEM, 2024, p. 1). The curriculum is divided into key components such as grammar, vocabulary, reading, speaking, listening, and writing. For example, grammar lessons include "question forms, modals, passive voice," and other fundamental topics, while vocabulary exercises focus on "topics like work, culture, education, and leadership" (ENSEM, 2024, p. 3). Additionally, the course aims to improve students' soft skills through activities like "teamwork, communication skills, and public speaking," preparing them for general professional environments (ENSEM, 2024, p. 4).

While these elements are essential for a well-rounded education, they do not align with the specific needs of mechanical engineering students, who require more focused training in technical English. The course's broad approach to language learning is more suited to students pursuing careers in business or management rather than those in highly specialized technical fields.

4. Identified Gaps in the Current Curriculum

The primary gap in the current curriculum lies in its lack of specialized content tailored to the linguistic demands of mechanical engineering. As Hutchinson and Waters (1987) explain, "ESP is an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning" (p. 19). For mechanical engineering students, their primary reason for learning English is to effectively engage with technical documents, communicate precise technical information, and collaborate in engineering contexts. Unfortunately, the current course does not address these needs. Instead, it offers a general language curriculum that fails to equip students with the technical vocabulary and genre-specific skills necessary for success in their field.

5. Methodology

This section explains the methodological framework used to identify curriculum gaps in the "Business English and Soft Skills" course for mechanical engineering students at ENSEM Hassan II University. By integrating personal teaching experience, content analysis, and systematic needs assessment, this study seeks to provide actionable insights to enhance the curriculum.

5.1 Research Design

The study adopted a mixed-methods approach, blending qualitative content analysis with experiential observation. This approach allowed for a nuanced exploration of how the existing curriculum aligns with or deviates from the linguistic and professional requirements of mechanical engineering students. The guiding research question was: How effectively does the current curriculum address the specific needs of mechanical engineering students?

5.2 Data Collection

The data sources for this research were twofold. First, the official course descriptions provided by ENSEM at the start of the teaching assignment were examined. These documents served as a baseline for understanding the curriculum's intended outcomes and emphasis. Second, insights were drawn from three years of practical teaching experience. This involved observing students' engagement, feedback, and performance in the course.

As Krippendorff (2018) asserts, "Content analysis enables researchers to infer meaningful patterns from textual data by systematically categorizing and evaluating content" (p. 86). In line with this, course descriptions were meticulously analyzed to identify themes, gaps, and misalignments with professional needs.

Systematic observational data were also gathered during teaching sessions. By documenting recurring challenges faced by students—particularly in areas such as technical vocabulary, genre-specific communication, and technical writing—a clearer picture of the curriculum's limitations emerged.

5.3 Content Analysis

Content analysis was pivotal in uncovering the thematic shortcomings of the curriculum. Using Krippendorff's framework for unitizing and categorizing content, the course materials were examined to determine the absence or presence of key competencies (Krippendorff, 2018, p. 128). This analysis highlighted a predominant focus on general business communication and soft skills, while critical areas specific to engineering contexts were underrepresented.

5.6 Needs Assessment

To corroborate the findings from content analysis, a systematic needs assessment was conducted. Hutchinson and Waters (1987) emphasize that "ESP instruction must align with the learners' professional objectives to ensure relevance and efficacy" (p. 19). This phase of the research triangulated data from three key sources:

1. **Student Interactions:** Informal feedback gathered during lectures and assessments shed light on students' perceptions of the curriculum's relevance and effectiveness.
2. **Professional Benchmarking:** The curriculum was benchmarked against the linguistic and communicative demands typical of mechanical engineering professionals, drawing on both academic and industry standards.
3. **Teaching Reflections:** Reflexive practices allowed for the identification of gaps as teaching materials were adapted in response to observed deficiencies.

6. Findings and Validation

The triangulation process confirmed significant gaps in the current curriculum. The findings revealed three critical inadequacies:

1. Insufficient emphasis on technical vocabulary pertinent to mechanical engineering.
2. Lack of structured guidance in technical writing and documentation.
3. Minimal focus on oral and written communication tailored to engineering contexts.

The methodology's robustness was reinforced by its adherence to the principles outlined in "Research Principles, Methods, and Statistics in Applied Linguistics." Khodadady (2013) underscores that "Rigorous methodology ensures that research findings are replicable and contextually grounded" (p. 9).

7. Ethical Considerations

This research adhered strictly to ethical practices. Observations and data collection were conducted with full transparency and a commitment to safeguarding student confidentiality. No identifiable information was used, ensuring participants' privacy throughout the study.

The methodological approach employed in this study enabled a comprehensive identification of curriculum deficiencies. By integrating experiential insights with systematic content analysis and needs assessment, the research highlights the critical need for a specialized ESP curriculum. Such a curriculum would better equip mechanical engineering students with the linguistic and professional skills essential for their future careers.

8. Analysis of Curriculum Gaps

Our analysis of the curriculum reveals several specific areas where it falls short of meeting the needs of mechanical engineering students:

1. **Reading and Comprehension of Technical Documents:** The course does not include instruction on reading and comprehending technical documents, which is a critical skill for engineers who must interpret complex technical manuals, specifications, and research articles.

As Hyland (2004) notes, genre-based approaches in ESP are essential because they help students understand "the ways language functions in different professional contexts" (p. 24). The absence of such content in the ENSEM curriculum leaves students unprepared for the types of reading they will encounter in their professional lives.

2. **Technical Writing Skills:** The course lacks training in writing technical reports and documentation, which are fundamental tasks in engineering. Technical writing requires precision, clarity, and an understanding of the specific conventions of engineering genres—skills that are not addressed in the current course. Instead, the course focuses on general business writing, such as writing reports and conducting SWOT analyses, which do not align with the technical writing needs of engineers.
3. **Oral Communication in Engineering Contexts:** Mechanical engineers must be able to present technical information clearly and concisely to both specialists and non-specialists, negotiate technical specifications, and participate in discussions about complex engineering projects. The current curriculum's focus on general business communication, such as giving elevator pitches and engaging in role-plays, does not adequately prepare students for these tasks.

9. Impact of the Current Curriculum on Mechanical Engineering Students

The gaps identified in the curriculum have significant implications for mechanical engineering students at ENSEM. Without specialized instruction in technical vocabulary and genre-specific communication, students are likely to struggle with the linguistic demands of their profession. They may find it challenging to read and understand technical documents, write precise and clear technical reports, and communicate effectively in engineering contexts. As a result, they may be underprepared for professional roles that require these skills, potentially limiting their career prospects and their ability to contribute effectively to engineering projects.

Moreover, the lack of alignment between the curriculum and the students' professional needs could lead to frustration and disengagement. When students perceive that the content they are learning is not relevant to their future careers, their motivation to learn may decrease. This is particularly concerning in fields like engineering, where strong English language skills are essential for success in the global industry.

10. The Need for a Specialized English Course for Mechanical Engineering

To address these issues, there is a clear need for a specialized English course tailored to the needs of mechanical engineering students at ENSEM. Such a course should integrate genre-based approaches to ESP, focusing on the specific communicative tasks and language used in mechanical engineering. This approach would involve teaching students how to read and interpret technical documents, write technical reports and documentation, and communicate effectively in engineering contexts.

A genre-based approach is particularly well-suited to this context because it emphasizes the importance of understanding the conventions and discourse practices of specific professional communities. As Hyland (2007) argues, "Genre-based pedagogy not only provides students with the tools they need to participate in their chosen professions but also helps them understand how language functions within those professions" (p. 152). By adopting this approach, ENSEM can better prepare its mechanical engineering students for the linguistic challenges they will face in their careers.

11. Proposed Course Content

A specialized English course for mechanical engineering students at ENSEM should include the following key components:

Curriculum Component	Description	Key Focus Areas
Technical Vocabulary Acquisition	Focused instruction on the specialized vocabulary used in mechanical engineering, covering terms related to materials, processes, machinery, and systems.	- Learning terminology related to engineering materials - Understanding vocabulary for machinery and processes - Mastering system-related terms.
Technical Writing Skills	Training in the conventions of technical report writing, research papers, and project documentation, with an emphasis on clarity, precision, and organization.	- Writing clear technical reports - Structuring and organizing research papers - Documenting engineering projects effectively
Genre-Based Pedagogy	Instruction on the specific genres of communication that engineers encounter, such as manuals, specifications, and patents.	- Understanding and writing manuals - Drafting and interpreting specifications - Developing and analyzing patents
Oral Communication in Technical Contexts	Training in presenting technical information to both specialist and non-specialist audiences, including the use of visual aids, technical descriptions, and data interpretation.	- Using visual aids effectively - Simplifying technical descriptions for broader audiences - Presenting and interpreting data clearly
Reading and Comprehension of Technical Texts	Strategies for understanding complex technical documents, including schematics, diagrams, and research articles.	- Interpreting schematics and diagrams - Extracting information from research articles - Critical reading of technical manuals

12. Conclusion

The evaluation of the "Business English and Soft Skills" course at ENSEM Hassan II University reveals a significant misalignment between the curriculum's objectives and the linguistic needs of mechanical engineering students. While the course effectively enhances general English proficiency and soft skills, it fails to address the specialized requirements necessary for success in a technical field. The curriculum's emphasis on business communication and general language development neglects critical areas such as technical vocabulary acquisition, genre-specific communication, and precise technical writing.

To address these deficiencies, the study proposes a specialized ESP course tailored to mechanical engineering students. This course should integrate genre-based approaches, focusing on the specific communicative tasks and language demands relevant to the engineering profession. Emphasis should be placed on reading technical documents, writing detailed reports, and delivering clear oral presentations. Aligning language instruction with the professional goals of engineering students is not merely an enhancement but an essential step to ensure ENSEM graduates are equipped to meet the demands of a globalized engineering industry. Implementing such a curriculum will significantly improve students' professional readiness and their ability to contribute effectively to their fields.

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