
Bridging the Gap: Teaching English for Engineering Purposes (EEP)

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Abstract:

The increasing globalization of the engineering sector necessitates a strong command of English, not only for general communication but also for domain-specific tasks such as technical writing, documentation, and collaboration on international projects. However, engineering students often struggle to transfer general English proficiency to discipline-specific communication contexts. This research paper explores the gap between general English instruction and the communicative needs of engineering students and proposes targeted approaches for teaching English for Engineering Purposes (EEP). Through a qualitative case study involving interviews with instructors and a needs analysis survey among engineering students at three universities, the study identifies critical language skills and situational needs. Findings emphasize the importance of integrating genre-based instruction, task-based learning, and collaboration with subject-matter experts to make English instruction more relevant and effective for engineering students. The paper concludes with pedagogical recommendations for curriculum developers, language instructors, and policy-makers in engineering education.

Keywords: English for Engineering Purposes, Technical communication, Genre-based instruction, Task-based learning, Engineering education

Introduction

In today's interconnected world, English has become the global lingua franca of science, technology, and engineering. Engineering professionals are increasingly expected to operate in multilingual teams, attend international conferences, publish in English-language journals, and work in transnational corporations where English serves as the primary medium of communication. As such, proficiency in English is no longer just an added advantage for engineers—it is a core competency.

Despite this global demand, a significant disconnect persists between the English language skills engineering students acquire during their undergraduate education and the linguistic demands of their academic and professional lives. While general English courses may help students develop basic language skills, they often fail to address the specialized

vocabulary, discourse structures, and communicative conventions that characterize engineering communication. This results in a critical skills gap that leaves many engineering graduates underprepared for the real-world tasks they will encounter, such as writing technical reports, delivering project presentations, interpreting specifications, and participating in cross-functional meetings.

English for Specific Purposes (ESP) emerged in response to such challenges, offering tailored language instruction that focuses on the specific needs of learners within particular fields. English for Engineering Purposes (EEP), a subfield of ESP, targets engineering students and professionals by equipping them with the communicative competencies required in both academic and workplace engineering contexts. However, despite the growing recognition of EEP, many institutions continue to offer English instruction that remains generic, isolated from engineering content, and delivered by instructors unfamiliar with engineering discourse. The result is a curriculum that is misaligned with the actual needs of learners.

Moreover, engineering students themselves often perceive English language courses as peripheral or even irrelevant to their core studies. This perception is reinforced by traditional teaching methods that emphasize grammar drills and literary texts over practical, discipline-related communication. Consequently, student motivation suffers, and opportunities for authentic language learning are lost.

To address this persistent gap, there is a need to reimagine how English is taught to engineering students. This involves conducting systematic needs analyses, collaborating across departments, and designing instructional materials that are authentic, relevant, and grounded in real engineering communication practices. By doing so, English instruction can be transformed from a generic academic requirement into a meaningful, discipline-specific tool that supports student success in both university and professional settings.

This research aims to contribute to this transformation by investigating the current state of English for Engineering Purposes instruction in university settings and identifying strategies to bridge the gap between language education and the communicative realities of the engineering profession. Specifically, the study seeks to:

1. Analyze the communicative needs of engineering students based on their academic and career goals.
2. Evaluate the extent to which current EEP instruction meets these needs.
3. Explore effective pedagogical approaches and instructional frameworks suitable for EEP contexts.

By addressing these objectives, the study provides a roadmap for educators, curriculum designers, and policy-makers seeking to enhance English instruction for engineering students in ways that are practical, context-sensitive, and forward-looking.

2. Literature Review

2.1 English for Specific Purposes (ESP) and Its Evolution

ESP has evolved as a sub-discipline of applied linguistics aimed at teaching English tailored to learners' specific needs, often within academic or professional domains (Dudley-Evans & St. John, 1998). ESP is distinguished from General English (GE) by its focus on specific genres, vocabulary, and communicative practices relevant to a discipline. Early ESP courses often focused on reading comprehension and vocabulary acquisition, but recent trends emphasize genre-based and task-based approaches.

2.2 Defining English for Engineering Purposes (EEP)

EEP is a branch of ESP focused on developing English proficiency within the engineering domain. EEP courses typically aim to support reading of technical documents, writing of reports and specifications, participation in meetings, and presentation of technical content (Hyland, 2007). Engineering discourse is characterized by precision, objectivity, and structured logic—features that must be explicitly taught.

2.3 Challenges in Teaching EEP

Several challenges hinder the effective delivery of EEP:

- **Lack of collaboration between language and engineering faculty** (Basturkmen, 2010).
- **Instructors' limited familiarity with engineering discourse.**
- **Generic course materials** that fail to reflect authentic engineering communication.
- **Students' perception** that English courses are irrelevant to their technical studies.

2.4 Needs Analysis in EEP

Needs analysis is fundamental to ESP course design. Hutchinson and Waters (1987) distinguish between target needs (what learners need to do) and learning needs (how they learn best). For engineering students, needs often include reading technical manuals, writing lab reports, participating in design discussions, and understanding technical presentations.

3. Methodology

3.1 Research Design

A qualitative case study methodology was employed to explore the EEP landscape in three engineering faculties from public universities in non-native English-speaking countries. This design allowed an in-depth examination of instructional practices, student needs, and institutional challenges.

3.2 Participants

- **Students:** 90 third- and fourth-year undergraduate engineering students (mechanical, electrical, and civil engineering).
- **Instructors:** 6 English instructors and 3 engineering faculty members who contribute to EEP course planning.

3.3 Instruments

- **Survey:** A structured needs analysis survey focused on language tasks (reading, writing, speaking, listening), frequency of use, and self-perceived competence.
- **Interviews:** Semi-structured interviews with English instructors and engineering professors.
- **Document Analysis:** Review of course syllabi, sample assignments, and student writing.

3.4 Data Analysis

Survey data were analyzed using descriptive statistics. Interview transcripts and documents were coded thematically using NVivo, with themes aligned to communicative needs, instructional methods, and curriculum alignment.

4. Findings and Discussion

4.1 Student Perceived Needs

Survey results indicate that students consider **reading technical material** (e.g., manuals, specifications, academic papers) and **writing reports** as the most essential English skills for their academic success and future careers.

Language Task	Perceived Importance (%)	Self-Competence (%)
Reading Technical Docs	92	55
Writing Lab Reports	88	48
Listening to Lectures	81	60
Speaking in Presentations	76	42

The low self-competence ratings suggest a significant skills gap that EEP must address.

4.2 Instructional Gaps

Interviews revealed that many EEP courses are **grammar-based**, focusing on general English exercises rather than discipline-specific communication. Instructors admitted limited knowledge of engineering topics, making it difficult to develop relevant materials.

"I don't have an engineering background, so I just use technical reading passages from textbooks... but students find them boring and not useful," said one instructor.

4.3 Genre and Task Deficiency

Analysis of course materials revealed an absence of authentic engineering genres such as feasibility reports, project proposals, or technical specifications. Most writing tasks involved general essays or generic summaries, with little connection to engineering tasks students will encounter in the workplace.

4.4 Student Motivation and Attitudes

Students expressed low motivation toward English classes, describing them as disconnected from their "real" studies. However, when presented with opportunities to write project abstracts or deliver mock technical presentations, motivation increased significantly.

5. Pedagogical Implications

5.1 Genre-Based Instruction

Genre-based instruction involves teaching students the structure and function of real-world texts. For EEP, this means exposing students to models of technical reports, user manuals, and project proposals, and guiding them through the processes of drafting, peer-reviewing, and revising such texts.

Example: Teaching how to write a "Design Rationale Document" with sections on problem definition, engineering approach, testing protocol, and results interpretation.

5.2 Task-Based Language Teaching (TBLT)

TBLT focuses on using language as a tool to complete real-world tasks. In EEP, this might involve simulations such as:

- Participating in a design review meeting
- Preparing an oral presentation of a capstone project
- Writing a project update email to a (hypothetical) international client

TBLT has been shown to improve student engagement and practical communication skills (Ellis, 2003).

5.3 Interdisciplinary Collaboration

EEP programs benefit from collaboration between language instructors and engineering faculty. Joint curriculum design ensures that language tasks reflect actual academic and industry practices.

5.4 Integration with Engineering Curriculum

Rather than treating EEP as a separate course, English instruction should be embedded in engineering modules. For instance, language instructors could support communication components in project-based learning courses.

Conclusion:

As the engineering profession becomes increasingly globalized, the ability to communicate effectively in English is critical. Yet traditional English language instruction often fails to meet the real needs of engineering students. This study has shown that English for Engineering Purposes must move beyond general language instruction to include task-based, genre-focused, and interdisciplinary approaches.

Students need support in reading complex texts, writing technical documents, and presenting engineering ideas clearly and accurately. To achieve this, EEP instruction should be situated within authentic engineering contexts and aligned with students' academic and professional goals.

Recommendations

1. **Develop localized EEP curricula** grounded in needs analysis from engineering students and faculty.
2. **Provide training for English instructors** to familiarize them with engineering discourse and genres.
3. **Create a repository of authentic engineering texts** (e.g., reports, abstracts, presentations) for classroom use.
4. **Foster collaboration** between language and engineering departments for co-teaching and resource development.
5. **Embed communication tasks** within engineering coursework rather than isolating them in standalone English classes.

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