

Designing an ESP Course for Telecommunication Engineers in the Medical Diagnostics Industry: A Problem-Based Learning Approach

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Abstract: This article describes the design and development of an English for Specific Purposes (ESP) course for eight Indian telecommunications engineers working for a global medical diagnostics company. These professionals, who have pre-intermediate English competence, require better language abilities for effective technical communication in foreign settings. The course, which follows a problem-based learning (PBL) approach, incorporates authentic problems, targeted vocabulary education, and interactive assessments to help participants improve their communication skills in their professional domain. Based on relevant ESP literature, this paper examines requirements analysis processes, course design reasoning, evaluation strategies, and the incorporation of real-world materials, demonstrating how theory and practice meet in a highly contextualized ESP setting.

Introduction: The increased demand for workplace communication in technical disciplines has resulted in the creation of ESP courses that cater to specialized learner demands. This article describes the design of a 12-week ESP course for eight Indian telecommunications engineers working for a medical diagnostics company. These personnel are in charge of delivering technical support, training, and presentations on the company's medical equipment to global clientele. Despite their technical expertise, their limited English proficiency—particularly in technical vocabulary and spoken communication—creates difficulties in international settings.

This ESP course aims to bridge the gap between their existing language skills and their professional communication requirements. A problem-based learning (PBL) framework is used to imitate real-world engineering difficulties, increase learner motivation, and promote critical thinking, teamwork, and linguistic competency in technical English.

ESP Context and Learner Profile

The intended learners are telecommunication engineers who assist with the design, installation, and maintenance of medical diagnostic equipment exported internationally. English is used for overseas installations, troubleshooting, technical training, and

international conferences. While the engineers are capable of managing daily conversations, they struggle with professional communication and technical vocabulary. Their speaking and listening abilities are insufficient for the demands of technical discussions, project meetings, and customer engagements.

The training takes place three times a week over 12 weeks, and focuses on enhancing listening comprehension, technical vocabulary, and spoken communication in technical and workplace contexts related to telecommunications and medical diagnostics.

Needs Analysis

A comprehensive needs analysis formed the foundation of the course design. As emphasized by Woodrow (2018), needs analysis is the critical first step in developing effective ESP instruction. Drawing on Long's (2005) recommendation to gather data from multiple sources, a triangulation method was employed:

- **Questionnaires** were distributed to the engineers to gather information about their current skills, perceived weaknesses, and job-related language needs.
- **Text analysis** of technical documents (e.g., manuals, repair guides) helped identify recurring linguistic patterns and relevant vocabulary.

• **Interviews** were conducted via video calls with both engineers and, where possible, their supervisors, to gain deeper insight into professional expectations and communication challenges.

This process ensured a multidimensional understanding of learners' needs and minimized bias or error in course development (Cowling, 2007).

Course Design and Theoretical Framework

The course takes a Problem-Based Learning (PBL) approach that combines constructivist and experiential learning principles. PBL puts learners at the center of real-world problem solving, encouraging them to use the target language while working on actual technical issues. This paradigm is consistent with the engineers' daily tasks, such as diagnosing problems, providing solutions, and explaining methods.

As Maxwell (2009) and Woodrow (2018) note, PBL fosters not only language development but also teamwork and higher-order thinking. In this course, learners collaborate on progressively complex case scenarios drawn from their work, such as troubleshooting malfunctioning equipment or preparing for a client training session.

Although genre-based and case-study approaches were considered, PBL was selected due to its alignment with learners' job roles, which often involve finding singular, effective solutions to technical problems.

Course Aims

The course aims to:

- Enable learners to comprehend and use technical terms in telecommunications and medical diagnostics.
- Improve verbal communication skills for technical conversations, team meetings, and client engagements.
- Teach trainees how to examine technical challenges and effectively explain viable solutions.
- Encourage teamwork and confidence in delivering presentations and training sessions.
- Develop proficiency in discussing technical and semi-technical themes in professional contexts.

Assessment Strategy

Assessment follows O'Sullivan's (2012) principles for testing in ESP contexts—namely authenticity,

specificity, validity, and practicality. Both formative and summative assessments are integrated to monitor learner progress and achievement.

Formative Assessments (ongoing):

- Use Quizlet for vocabulary quizzes and receive fast feedback.
- Perform listening tasks for technical presentations or support calls.
- Simulating technical support calls, customer briefings, and corporate meetings.

Summative Assessments (end-of-course):

- Learners give a final oral presentation on a technical problem.
- Comprehensive listening exam for sophisticated technical speech.
- An analytic rubric measures fluency, organization, pronunciation, and vocabulary when assessing speaking skills.

These evaluations replicate real-life workplace tasks, ensuring relevance and interest.

Course Materials

The course incorporates a variety of authentic and adapted materials, chosen for relevance, engagement, and skill integration:

1. Textbooks: Woodrow's English for Engineers (2018) and Viana's ESP materials (2019).
2. Technical Manuals: Real equipment documentation to familiarize learners with workplace language and formats.
3. PBL Tasks: Create customized scenarios based on workplace concerns.
4. Use digital tools like Quizlet flashcards, audio recordings, and webinars to develop vocabulary and listening skills.
5. Role-playing: Simulate technical support calls and training scenarios to improve speaking skills.
6. Industry Reports: Use relevant documents to model technical writing and terminology.
7. Feedback Tools: Rubrics and checklists help guide reflection and quantify performance.

Telecommunication Engineers Syllabus Outline

This table is aligned with the table of Lockwood (2012).

Week 1 : Technical Vocabulary and Communication Skills		
Objective:		
- Introduce essential vocabulary related to medical equipment and telecommunications.		
- Practice effective communication skills in various scenarios.		
Day	Topics	Activities

Day 1	Introducing technical Vocabulary	• Presentation on common technical terms used in medical diagnostic equipment. • Vocabulary exercises using Quizlet or similar tools. • Group discussion on using technical terms in context.
Day 2	Developing communication Abilities	• Lecture on effective communication strategies in technical contexts. • Analysis of sample technical documentation and presentation. • Pair work: Engineers prepare and deliver short presentation on technical topics related to their field.
Day 3	Practical application and assessment preparation	• Simulation exercise: Mock technical meeting or conference call. • Feedback session on communication effectiveness and technical accuracy. • Recap of technical vocabulary learned during the week. • Formative assessment: Short quiz or task to assess comprehension and retention of technical terms.
Homework	Review and Preparation	• Review technical vocabulary using Quizlet. • Prepare for upcoming presentations or role-plays.
End of Week Reflection		
	Engineers reflect on their progress in technical communication skills	• Individual goal-setting for the next week's focus.

Reflection

Designing this ESP course for telecommunication engineers has given me a unique opportunity to hone and expand my skills as an ESP educator in an international setting. This project has been an invaluable learning experience, allowing me to combine academic frameworks with practical applications designed exclusively for telecoms experts.

Throughout the creation of this course, I gained a better grasp of the crucial role that needs analysis plays in developing good ESP education. Woodrow (2018), Viana (2019), Lockwood (2012), and other related literature have all helped shape my approach to course design. The triangulation method—which includes questionnaires, text analysis, and face-to-face interviews—has been particularly useful in ensuring that the course content is both relevant and responsive.

As recommended by Woodrow (2018), using problem-based learning (PBL) has been a good decision. PBL's focus on practical problem-solving fits in nicely with the needs of telecommunications engineers, who have to handle intricate technological issues. Pre-intermediate students may find PBL challenging, but I have scaffolded projects to ease them into more difficult problem-solving exercises. This method makes sure that students develop their skills in a methodical and efficient manner by providing them with opportunities for collaborative learning, increasingly difficult assignments, and planned assistance.

Assessment planning, led by O'Sullivan's (2012) extensive insights, has become an essential component of course design. The assessment technique consists of continuous formative evaluations, a midterm evaluation, and a final summative assessment. This systematic approach ensures that students receive continual feedback, allowing them to grow and grasp technical English.

Course materials have played an important role in the design process, contributing to an interesting and effective learning environment. The course meets the specialized demands of telecommunication engineers by incorporating authentic materials, digital technologies, and real-world technical documentation samples. The deliberate selection of resources ensures that the course is active, relevant, and connected with the learners' professional situations.

The comments and insights gathered while developing this ESP course for telecommunication engineers highlight the need of combining academic knowledge with practical application. The course is aimed to help students improve their technical vocabulary, communication skills, and professional development.

The course's emphasis on hands-on exercises, interactive activities, and personalized materials is intended to provide engineers with the skills they need to flourish in their professions and contribute effectively to their field.

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