

Implementing ESP Lessons for Engineers: Research and Practices

Munassir Alhamami

Instructor at King Khalid University & PhD student at University of Hawaii

Abstract

This paper implements English for Specific Purpose (ESP) lesson for the students who need to develop their English language skills in the field of engineering in general. First, the paper introduces the lesson and describes the context by the use of the guidelines from the ESP literature. Next, the paper implements the lesson proposal rationalizes it with the research in the field of ESP. Finally, the paper describes the lesson plan and its activities in details.

Introduction

Different universities and educational institutions offer English programs for the students who will join the field of engineering. The programs vary in the length of time. However, ESP programs are usually intensive. Dudley-Evans and St. John (1998) stress that ESP courses are generally intensive and narrow focused. They focus on specific skills in specific contexts for specific students. This comes as result of the students' needs, the resources available and the contexts where the courses are conducted.

The need for the ESP courses at the university level is significantly important. Non-native English students need to develop their understandings of the language that is used in a specific context in terms of vocabulary, registers, styles, common structures, and specific formats. The students also need to develop their academic skills and familiarize themselves with the new academic environment (Gatehouse 2001). Due to these reasons, Universities established different types of ESP courses for different

colleges such as English course for the College of Computer, English course for the College of Engineering, English course for the College of Medicine, and English for the College of Sciences.

By the use of the guidelines and principles in ESP literature, this Project paper concentrates on the English course for the College of Engineering. The lesson is designed to develop the English proficiency and the academic skills for the students who might attend the College of Engineering since English language is the medium of instructions at the College of Engineering in many universities around the world. In this learning environment, the students need to communicate with their instructors who cannot speak English, read the textbooks, write the assignments and exams in English and become familiar with the academic environment.

Literature Review

The ESP literature stresses that the ESP course should not teach students English poetry, slang, or advanced English if the students do not need that in their fields (Darian 1972). It should teach students what they will encounter in their fields. In order to be qualified to attend the College of Engineering, students need to develop the four language skills within the context of engineering. For example, the students need to communicate with their professors in short and long conversations since that some instructors might not be able to speak the students' first languages. Students also need to listen and comprehend lectures and presentations that consist of large portion in their program since that English is the medium of instructions. In addition, they have to do presentations as a part of their assignments in the college. Students also need to read and comprehend both short and long texts since that is the main resources of input of knowledge in the

academic life. Murphy states, "in the teaching of English for Academic Purposes (EAP), there is growing recognition that second language (L2) learners of English must possess strong listening and reading abilities in order to succeed in university courses" (1996, 105). Having high levels in reading and listening will help the students to acquire knowledge effectively.

Students also need to write essays and research in English. Definitely, students need to have sufficient knowledge of vocabulary and terms used by engineers. These words and terms will be contextualized throughout the lesson in the four language skills. Swales states that "the importance of teaching vocabulary in ESP is now widely accepted" (cited in Dudley-Evans 1998, 80). In addition, Cartner (2009) and Nation (2001) stress that vocabulary and terms are necessary to succeed in the academic studies. Vocabulary is the basic blocks in the language of communication. Howard and Master (1997) summarize the requirements of successful EAP course. They write, "in order to provide adequate preparation for college/ university-level work, the EAP instructor must be able to teach the following: (a) reading (e.g. scanning, skimming, extensive reading, critical thinking). (b) writing (e.g. academic discourse, genres, grammar). (c) listening/speaking (e.g. lectures, oral presentation)" (29). Another point, students need to be familiar with the academic life in the College of Engineering in terms of language, roles, and duties. Gatehouse (2001) states that ESP students need to build their academic skills and be familiar with the new environment in order to succeed.

Statement of purpose

This paper introduces a lesson proposal that will be used in the English course for the College of Engineering and students who need to develop their English proficiency in

the engineering contexts. The lesson integrates the four language skills. The skills are organized in the normal order that the native speakers acquire them. To illustrate, the listening task will precede the speaking task and the reading task will precede the writing task.

Implementing the Teaching Proposal

Description

The lesson proposal is designed to focus more on the content-based and skill-based syllabus. Lowe (2010) stresses that in ESP course content is taking the priority. In this lesson, the content focuses on the field of engineering. The content shapes the purpose of this lesson. Richards (2001) states that all language courses to some extent build on content. This lesson is an introductory lesson in one-year ESP program. The lesson does not teach particular grammar rules or particular engineering terms. The reason is that this lesson might come at the beginning of the course.

Materials

The materials that will be used in this lesson will have pre and post activities. The activities are also varied to vary the language outputs. Rubdy (2003) stresses that language learning materials should provide students with variety of activities and topics to facilitate language acquisition. This will also help the teacher to avoid the boredom of repetition. Even ESP materials usually do not present culture based materials (Barron 1991). The teacher should be aware not to include materials that contain things that might conflict with the international publishers and students' cultures and values (Cook 2000). Information related to these topics might shift the purposes of learning and raise issues that are not related to learning in the classrooms.

At the micro-level, the lesson should have academic words (Coxhead 2000). To illustrate, the students need to know the common academic words. These words are used by most academic fields at the university publication levels. For example, the lessons in the one-year program might include the following words: available, clause, consist, restrict, major, section, task and text. In addition, students need to use more single verbs than phrasal verbs which is more appropriate in the academic contexts (Mendis 2010. Swales and Feak 2004). Students need to be aware about some lexical items that build the academic texts. In the College of Engineer, the students need to write academic papers as a part of their engineering courses requirements.

Sequencing

Each discipline has a specific genre that students need to know (Charles, Pecorari, and Hunston 2009. Hewings 2004. Swales and Feak 2004). Students need to know the genre so that they will be able to communicate with that community. In this lesson, the students are introduced to the language that is used in the field of engineering by introducing engineering content. The students might study specific genre in the field of engineering in later lesson such as writing engineering reports. This is an introductory lesson that is build on the engineering content. The content in the lesson is sequenced chronologically. Richards (2001) writes, “content may be sequenced according to the order in which events occur in the real world” (150). It is sequenced based on the acquisition of the four skills in the real world: Listening, speaking, reading and writing. The receptive skills precede the productive skills. Dunkel (1986) stresses that in good language materials listening comes before speaking. This will help the students to learn the language effectively and become better language learners.

The materials that will be used in this lesson come from the authentic resources. Saraceni (2003) states, “materials should be based on authentic texts, that is texts which have been written for any purpose other than language teaching” (77). Therefore, language teachers should prepare their students by teaching them authentic materials and use authentic activities that students are going to do in the college. Outside the language-teaching classroom, students are going to listen and read language that is not modified for the nonnative speakers. Lowe (2010) clarifies, “language teachers should dare to use authentic texts, and must use authentic activities such as summarizing, outlining and inferencing” (1).

It is the teachers’ responsibility to use the authentic materials, and they can do that by choosing the texts that are not written for language learning and teaching purposes. “Grellet argued against the simplification of texts and insisted on the use of authentic texts 'whenever possible'.'Authentic' to Grellet meant that 'nothing of the original text is changed and also that its presentation and layout are retained" (Littlejohn 1992, 105). In the College of Engineering, students will encounter books and articles that are written for English fluent speakers. The College of Engineering lectures and textbooks are not modified to meet the language levels of nonnative English speakers.

Supporting learning

Hutchinson and Waters (1987) say that in ESP course teachers are not responsible to teach subject matters contents rather they teach the language where the subject matters are explained. However, students will develop their knowledge about their discipline through reading and listening to materials that are taken from the authentic engineering resources.

Assessing learning

This lesson might be the one of the first lessons in the English for engineer's course. In the course, there could be a summative test (graded) to meet universities' policy. Morgan, Dunn, Parry, and O'Reilly (2004) and Bachman and Palmer (1996) stress that summative tests must be graded. In the test, the students will be tested on what they have learned during their study in the program. The students' language progress will be evaluated based the way they are taught. Folse (2006) stresses that the language skills should be assessed the way they were taught in the language classrooms in order to give accurate results of the students' levels.

Rubrics should be provided to the students before they do the tests or the tasks such as giving presentations and writing articles. Each task or test that students answer should be taken from the engineering context. For example, the problems that students will complain about or give suggestions should be engineering problems. The task that the students will do should be within the engineering context such as writing reports and writing summaries. Doing the course activities such as writing assignments and oral presentations help the students to assess themselves and see their progress (Tannenbaum 1996). In this lesson proposal, the students will be evaluated by post-task comprehension questions and post-task evaluation forms. The post-task questions will be used for the listening and reading tasks. The post-task evaluation forms will be used for the speaking and writing tasks.

Description of The lesson

Title: Who is an engineer?

Duration:	115 Minutes
Aims:	<p>1=The students will develop their listening skills.</p> <p>2= The students will develop their speaking skills.</p> <p>3= The students will develop their reading skills.</p> <p>4= The students will develop their writing skills.</p> <p>5= The students will increase their engineering terms.</p>
Objectives:	<p>1= The students will be able to listen and comprehend a short introductory presentation about the field of engineering. The short presentation defines engineers' jobs and their basic characteristics.</p> <p>2= The students will introduce themselves as engineers in the future. Students will be able to speak and introduce themselves as engineers to other people using common words that describe engineers.</p> <p>3=The Students will be able to read and understand an introductory text about the field of engineering. The text will help the students to improve their vocabulary and reading skills.</p> <p>4= The students will be able to write a short introductory paragraph about the field of engineering. This is an assignment for the students to do at home. Based on what they have learnt in the class, students will be able to write a short paragraph that introduces the field of engineering to other people.</p> <p>5= By doing these four skills' activities, the students will be able to know more</p>



	<p>common words and terms that are used in the engineering field. The students' vocabulary will increase by knowing the words' meanings, the words' spellings, the words' pronunciations, and the words' context uses.</p>
Evaluation:	<p>There are four ways to evaluate the attainment of the objectives based on the four language learning skills: listening, speaking, reading, and writing.</p> <p>1= The students will be evaluated about the comprehension of the listening task by handout that contains the comprehension questions about the video. See the appendix A.</p> <p>2= The students will be evaluated about the speaking skills using a rubric that will be provided to the students before they start their presentation. See the appendix B.</p> <p>3= The students will be evaluated about their reading skills by comprehension reading questions that follow the reading text. See appendix C</p> <p>4= Students will be evaluated about their writing skills by a detailed rubric that will be provided to them before their homework. See Appendix D</p>

Lesson Plan

Lesson Plan/Task Plan		
Activity Name:	Time: 115 M	Procedures:
Introduction	5 M	The teacher will introduce the lesson. The teacher will start asking the students questions such as, what does it mean to be an engineer? And what does an engineer do?
Watching Video	3 M	The teacher will play the following video: Introduction to Engineering by NASA. The link of the video is : http://www.youtube.com/watch?v=wE-z_Tjyzil . The students with the teacher will watch the video carefully and write down important words and difficult words in the video.
Vocabulary Elicitation	5 M	The teacher will elicit the words from the students. The teacher will write down the important words in the video and the ones that students find it difficult to understand on the board. The class together will write their meanings on the board. The teacher should elicit the meanings of these words from the students.
Watching the Video Again	3 M	The teacher will play the video again. This time the students will watch to answer questions about the video.
Listening Check	7 M	The teachers will divide the students into groups of three or four. Each group will have a handout about the video. The handout contains comprehension questions about the video. See, Appendix A. Students will answer these questions in groups. Then, the teacher will check the answers with the class together.
Who will you be?	25 M	In this activity, the teacher will ask the students to introduce themselves in the future as engineers. Each student will introduce himself in one minute to the class. The teacher will give the students the guideline for their short presentations. See Appendix B.
Pre Reading	3 M	The teacher will ask the students related questions about the passage in order to activate their schemata. For example, the teachers will ask the students about the meaning of the title of the passage. What they expect in the passage etc. See Appendix
Reading	10 M	The students will start reading the passage individually for the first five minutes. Next, They will read with their neighbors in

		five minutes. Students can reread the passage as many as they can.
Reading Check	8 M	The students will start answering the handout individually. The handout contains comprehension questions about the passage. See Appendix C. Next, the class together will answer the questions to make sure that the students get the right answers.
Wrap Up	5	During this time, the teacher will summarize what they have learnt in this lesson. In addition, he will give the students the guideline for the homework. The homework will be writing an introductory 2-3 paragraphs about the engineering field. See AppendixD.

Conclusion

This paper presented an integrative skills lesson proposal for the engineering students. The lesson is an introductory lesson in ESP program. The paper illustrates the lesson and its activities in details. The ideas and the rationale behind the activities are supported by the literature in ESP. This enriches the lesson and strengthens its outcomes. The lesson content comes from the engineering resources. The engineering vocabulary and terms are contextualized in the four skills: listening, speaking, reading, and writing.

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Appendix A

Listening Task:

Title: Introduction to Engineering by NASA

Materials: http://www.youtube.com/watch?v=wE-z_TJyziI

Watch the video carefully and answer the following questions:

1. Who is an engineer?

.....

2. Engineering is a noun:

A. True B. False

3. Engineers start their projects by asking questions:

A. True B. False

4. Engineers write down only important and doable ideas at the beginning:

A. True B. False

5. Order the following steps that are used by engineers to fix problems:

(Brainstorming, Creating, Testing, Drawing the plan, Proofing)

1.....

2.....

3.....

4.....

5.....

Appendix B

Speaking Task:

Title: Who you are in the future?

Materials: **One-Minute Presentation Rubric**

ESL Speaking Rubric				
	Poor 0 pts	Fair 1 pts	Good 3 pts	Excellent 5 pts
Clarity	Poor	Fair	Good	Excellent
	All questions and answers were awkward and incomprehensible.	Questions and answers were awkward and incomprehensible to understand at times.	Questions or answers were awkward at times but always understandable.	Questions and answers were clear and comprehensible.
Pronunciation	Poor	Fair	Good	Excellent
	Student's pronunciation was incomprehensible.	Student's pronunciation made understanding difficult.	Student's pronunciation was understandable with some error.	Student's pronunciation was like a native speaker.
Fluency	Poor	Fair	Good	Excellent
	Student was unable to ask or respond to questions.	Student took a long time to ask and respond to questions.	Students were able to ask and answer the questions with little difficulty.	Students were able to communicate clearly with no difficulty.
Comprehension	Poor	Fair	Good	Excellent
	Student was unable to comprehend questions. Questions had to be repeated.	The student showed little comprehension of questions. Questions had to be repeated.	The student understood most of what was asked of him/her.	The student fully understood the questions asked and answered correctly.
Content	Poor	Fair	Good	Excellent
	Did not ask appropriate question for information, no response to question.	Ask some inappropriate questions for information or answered question with very limited answers.	Gave appropriate questions for survey information but responses were limited in content.	Gave appropriate questions and good content in responses to questions.

Adapted from : <http://www.rcampus.com/rubricshowc.cfm?code=L24W4A&sp=yes>

Presentation Clues:

1. What is your title?
2. What do you do?
3. Where do you work?
4. How do you do your work?
5. Why do you do your work?

Appendix C

Reading Task:

Materials: Introduction to Engineering Passage

Introduction to Engineering

Anything that is built must first be engineered, or planned out. An engineer is a person who designs and builds complex products, machines, systems, or structures. Engineers want to know how and why things work. They have scientific training that they use to make practical things. Engineers often specialize in a specific branch of engineering. The field of engineering is divided into branches such as civil, electrical, mechanical, and chemical engineering. Many types of engineering must be performed to design and build a complicated system such as a spacecraft. For example, a spacecraft has electrical, mechanical, and propulsion systems. All those different systems must be designed before the whole spacecraft can work. The engineering design process is a series of steps that engineers use to guide them as they solve problems. During the design process, engineers:

- Identify the problem or challenge.
- Identify design requirements and limitations on the design due to available resources and the environment.
- Brainstorm possible solutions to the problem or challenge.
- Generate ideas and develop the most promising ones.
- Explore possibilities and the pros and cons of each.
- Select an approach by identifying the design that appears to solve the problem best.
- Build a model or prototype.
- Refine the design by identifying changes that need to be made and improving the model or prototype.

Questions:

1. What is an engineer?

Answer: Engineers are people who design and build the things we use every day.

2. How do engineers decide what they need to build?

Answer: They start with a question, generate ideas for ways to solve the problem, pick several that make sense, and then start drawing a plan.

3. What are the characteristics of a good engineering plan?

Answer: A good plan helps engineers focus on what they're making and why.

4. Why is experimentation important for engineers?

Answer: It's during experimentation that engineers learn what works and what does not.

5. What does the narrator mean when he says that it's good for engineers when things don't work in the first trial?

Answer: Failure gives engineers a chance to go back and improve on their original idea until they solve the problem.

Text was taken directly from: http://education.nationalgeographic.com/education/media/nasa-kids-intro-engineering/?ar_a=3

Appendix D

Writing Task:

Title: 2-3 Paragraphs that introduce the engineering field to others

Materials

Writing Rubric:

CATEGORY	4 - Very Good	3 - Good	2 - Needs Improvement	1 - Unsatisfactory	Points
Sentences & Paragraphs	Sentences and paragraphs are complete, well-constructed and of varied structure.	All sentences are complete and well-constructed (no fragments, no run-ons). Paragraphing is generally done well.	Most sentences are complete and well-constructed. Paragraphing needs some work.	Many sentence fragments or run-on sentences OR paragraphing needs lots of work.	
Grammar & spelling	Writer makes no errors in grammar or spelling.	Writer makes 1-2 errors in grammar and/or spelling.	Writer makes 3-4 errors in grammar and/or spelling	Writer makes more than 4 errors in grammar and/or spelling.	
Ideas	Ideas were expressed in a clear and organized fashion. It was easy to figure out what the letter was about.	Ideas were expressed in a pretty clear manner, but the organization could have been better.	Ideas were somewhat organized, but were not very clear. It took more than one reading to figure out what the letter was about.	The letter seemed to be a collection of unrelated sentences. It was very difficult to figure out what the letter was about.	
Length	The letter is 10 or more sentences.	The letter is 8-9 sentences.	The letter is 5-7 sentences.	The letter is less than 5 sentences.	
Capitalization and Punctuation	Writer makes no errors in capitalization and punctuation.	Writer makes 1-2 errors in capitalization and punctuation.	Writer makes 3-4 errors in capitalization and punctuation.	Writer makes more than 4 errors in capitalization and punctuation.	

Adapted from http://rubistar.4teachers.org/index.php?screen=ShowRubric&rubric_id=1035435