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Team Teaching in the University: Description of a Collaborative Experience between the Computer Engineering and the English Departments

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Abstract — **In the last twenty years, English for Specific Purposes (ESP) courses have become very popular due to the growth of science, technology, politics and economics, and also due to the condition of *lingua franca* of English language. From then on, the implementation of English specific courses has spread throughout the world and can be found in almost every educational institution. ESP courses at Universitat Jaume I (Castellón, Spain) are present in almost all the degrees. The objective of this paper was twofold: firstly, we describe the relevance of the English language in the Computer Engineering degree as students have to complete 6 European Credit Transfer System (ECTS) credits of the English subject in the first year and carry out activities in the English language corresponding to at least another 12 ECTS credits in the second, third and fourth year; and secondly, we explain the close cooperation between professors from the Computer Engineering department and professors from the English Studies department. This collaboration brings about the design and implementation of a rubric that is used to assess the compulsory oral presentations in English in the fourth year courses in the Computer Engineering Degree.**

Index Terms — **ESP courses, Computer Engineering degree, Team teaching, Rubric for English oral presentations**

I. INTRODUCTION

A. Definition of ESP

ESP can be defined as the study of the English language adapted to the specific needs and objectives of the learner (Strevens, 1977). ESP is not centered in one main objective; it varies depending on the focus of the student.

The definition given by Dudley-Evans & St John (1998) is based on absolute and variable characteristics:

Absolute characteristics:
- ESP is designed to meet specific needs of the learner;
- ESP makes use of the underlying methodology and activities of the disciplines it serves;
- ESP is centred on the language (grammar, lexis, register), skills, discourse and genres appropriate to these activities.

Variable characteristics:
- ESP may be related to or designed for specific disciplines;
- ESP may use, in specific teaching situations, a different methodology from that of general English;
- ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation. It could, however, be used for learners at secondary school level;
- ESP is generally designed for intermediate or advance students. Most ESP courses assume basic knowledge of the language system, but it can be used with beginners.

According to Hutchinson (1987), three determining constituents mainly generated the creation and growth of ESP: the demands of a Brave New World, a revolution in linguistics and the focus on the learner. The end of the Second World War produced a development in work and educational conditions. Regarding the development in the work area, scientific, technical and economical activity was increased and produced the need of an international language. The power that United States had in that moment made English the language needed for that purpose. This fact created a new generation of people wanting to learn English for a specific purpose, that is, learners knew the reason why they wanted to learn a language. From that moment on, the main objects to

language courses were the wishes and needs of the learners.

Concerning with the educational developments, the focus on the courses changed. Linguists (Hymes, 1972; Grice, 1975; Widdowson, 1983; Robinson, 1991; Escandell Vidal, 1995; Fowler, 1999 and Alcaraz Varó, 2000) came up with the idea that language use varies from one situation to another, so it would be possible to determine what features are used in one or another, and adapt those features to the specific language course. The guiding principle of ESP became `Tell me what you need English for and I will tell you the English that you need´ (Hutchinson & Waters, 1987: 8). Moreover, the educational psychology was also changed and it was highlighted the weight of the learners taking into account their needs, interests and attitudes towards the learning of a language.

ESP first appeared in the 60s. It was compared with the EST (English for Science and Technology), which was the pioneer field of this kind of study. Later on, ESP would add new fields: the English for Academic Purposes and the English for Occupational Purposes (Fuertes Olivera, 2005: 250-251).

That is the moment in which the concept of "register" appears, because it is based on the use and the social context. The English of a particular field has a specific register that is different from another. So, the idea was that some grammatical and lexical characteristics are more frequent than other ones in each register. Thus, its aim was to investigate those characteristics and create new materials that include those aspects as their focus (Hutchinson & Waters, 1987: 9-10).

In the mid-1970s, there was a need of creating materials that also take into account students' purposes to learn English and the focus now was on the needs of those who learnt the language. As Hutchinson said:

Given that the purpose of an ESP course is to enable learners to function adequately in a target situation, that is, the situation in which the learners will use the language they are learning, then the ESP course design process should proceed by first identifying the target situation and then carrying out a rigorous analysis of the linguistic features of that situation (Hutchinson & Waters, 1987: 12)

B. ESP at Universiy Jaume I (Castellón, Spain)

During the course of my research on the ESP courses at Jaume I University, I realized how important nowadays English language is. It is present in almost all the degrees available in the university, except for two of them: Degree in Chemistry and the Degree in Work Relationships and Human Resources.

All the ESP courses coincide that essential grammar has not to be left behind and that vocabulary is not the only thing that matters in these courses. The four main skills (reading, listening, writing and speaking) are trained in

all the ESP courses. Moreover, all the subjects make use of real and everyday discourses so as to teach ESP students in a correct way.

C. ESP in the Computer Engineering Degree

According to the White Paper of the Degree in Computer Engineering, people who obtain this degree must be professionals and have a broad and solid education that prepares them to manage and perform tasks of all phases of the lifecycle of systems, applications and products that solve problems in any field of Information Technology and Communications, applying its scientific knowledge and methods and techniques of engineering.

In the Computer Engineering degree, students should acquire these following sets of competencies:

1. Ability to design, edit, organize, plan, develop and sign projects in the field of Computer Engineering that whose purpose, the conception, development or operation of systems, services and applications

2. Ability to direct the activities covered by the projects in the field of computer science.

3. Ability to design, develop, evaluate and ensure the accessibility, ergonomics, usability and security of systems, services and applications, as well as managing information.

4. Ability to define, evaluate and select hardware and software platforms for the development and implementation of systems, services and applications.

5. Ability to design, develop and maintain systems, services and applications using engineering methods software as a tool for quality assurance.

6. Ability to design and develop computer systems or centralized or distributed architectures integrating hardware, software and networks.

7. Ability to recognize, understand and apply the necessary legislation for the development of the profession of Engineer in Computers and manage specifications, regulations and mandatory standards.

8. Knowledge of basic materials and technologies that enable learning and development of new methods and technologies as well as those that equip them with great versatility to adapt to new situations.

9. Ability to solve problems with initiative, decision making, autonomy and creativity. Ability to communicate and transmit knowledge and skills of the profession of Engineer in Computer Science.

10. Knowledge to perform measurements, calculations, assessments, appraisals, surveys, studies, reports, planning tasks and similar work computer

11. Ability to analyse and assess the social and environmental impact of technical solutions, understanding the ethical responsibility and professional activity Technical Engineer.

12. Knowledge and application of basic principles of economics and human resource management,

organization and planning projects, as well as legislation, regulation and standardization in the field of IT projects.

The subjects in the Computer Engineering degree, include competence in the English language.

The UJI recognizes the importance of communicative competence in a foreign language in its Document Style to establish that all new degrees must provide at least 5 % of their teaching in one foreign language.

In the new degree of Computer at UJI, English has been chosen as a foreign language, and students are given the competence at least in two ways. Firstly, conducting a basic subject English in the first year; secondly, by incorporating activities in that language in different subjects along the 4 courses of the degree. Thus obtaining competence is progressive throughout training. In the second year, reading comprehension is practiced by incorporating texts in English. In the third year, writing technical texts in this language is trained. Finally, in the fourth year, students practice oral English communication by making presentations in this language.

After having finished the Computer Engineering degree, students have completed 6 ECTS credits of the subject English and have carried out activities in the English language corresponding to at least another 12 ECTS credits in the second, third and fourth year. The different subjects in this competence include 50 hours of related activities, which corresponds to 2 ECTS credits each. In all these subjects, acquisition corresponding level of competence is assessed.

To enable the student to make inquiries concerning the activities to be performed in English, the Computer Science grade has English teachers. These teachers assist in the assessment of learning outcomes related to communication in English. This figure is covered by faculty of the English Studies department.

The subjects including English activities in the different courses are the following ones:

- First year: English (modern language) 6 credits

The core competencies related to the objectives generic and required for the degree is on the one hand, the ability to communicate orally and in writing in English in the field of information technology and communications and on the second hand, the ability to acquire new specific vocabulary in the field of information technology and communications.

- Second Year: Database and Operating Systems.
- Third Year: Software Engineering Basis, Intelligent systems
- Fourth Year: Engineering Project Management Software, Software engineering workshop, Systems Decision Support, Project management information systems, Management Systems Database, Emerging Technologies Networks and Mobile Devices and Advanced Architectures.

D. Team Teaching

According to Deighton (1971), team teaching is defined as a group of two or more teachers working together to plan, conduct and evaluate the learning for the same group of learners. Six models of team teaching have been identified by Maroney (1995) and Robinson and Schaible (1995). Team teaching usually involves a combination of these models dependent on the particular teachers and learners. For a description of the features of these models see Table 1.

TABLE 1: MODELS OF TEAM TEACHING

Model	Features
Traditional team teaching	• Teachers actively share the instruction of content and skills to all students
Collaborative teaching	• Team teachers work together in designing the course and teach the material not by the usual monologue, but rather by exchanging and discussing ideas and theories in front of the learners • The course uses group learning techniques for the learners, such as small-group work and student-led discussion
Complementary team teaching/ Supportive team teaching	• One teacher is responsible for teaching the content to the students, while the other teacher takes charge of providing follow-up activities on related topics or on study skills
Parallel instruction	• Class is divided into two groups and each teacher is responsible for teaching the same material to his/her smaller group
Differentiated split class	Dividing the class into smaller groups according to learning needs • Each educator provides the respective group with the instruction required to meet their learning needs
Monitoring teacher	• One teacher assumes the responsibility for instructing the entire class, while the other teacher circulates the room and monitors student understanding and behaviour

Another decisive aspect that needs to be taken into account when implementing cooperative programmes successfully lies in the fact that teachers are required to be teachers of both language and content simultaneously (Cummins 1994). Since this condition is hardly viable, Jacobs (2005) claims that team teaching is the more appropriate methodology to be adopted. Team teaching can be defined as a collaborative and "pedagogical method in which teachers of the same or of different subject areas co-operate in the planning, realisation and further development of an educational course, programme, etc." (Kaseva et al. 2006: 6). Hence, it involves mutual support and learning from and with each other, especially from the language teacher towards the content teacher, in the form of development of content terminology and materials, and advising on how the linguistic issues should be assessed (Pavón-Vazquez & Ellison 2013). This is an extremely usual situation that occurs when imparting these classes, since content teachers are neither native speakers nor experts in the foreign language, so they do not feel totally adapted and comfortable communicating in that language (Dalton-Puffer et al. 2010). Generally, the results of team teaching are positive; nevertheless, teacher training is required, since traditional methodologies employed by teachers need to be modified and adapted to the innovative conditions and competences, as Pavón-Vazquez & Ellison point out (2013).

II. COLLABORATIVE EXPERIENCE

The first step in the collaboration between the Computer Engineering and the English Studies Department was to set up a series of meetings among the teachers involved in the subjects. With the supervision of the Head of the Department, the objectives were established. So, we arranged the teams depending on the teachers implicated in each subject (depending on the year).

A. The agreements of these meetings were the following ones:
- Teachers of the English Studies department will develop a series of rubrics for the evaluation of activities related to written works and oral presentations.
- Content teachers responsible for the subjects involved shall publish these rubrics in virtual classrooms (virtual environments of the subject where teachers upload all the material and information related to the subject and where students can interact by means of a forum).
- Content teachers responsible for the subjects of the second year will review the way they evaluate students´ English proficiency.

- Teachers from the English Studies department in these subjects will participate in the production of material written in English provided to the students.
- At the beginning of each semester, the content teachers will facilitate teachers from the English Studies Department a space in one of their classes so that they can explain the evaluation criteria in the works written in English.
- The professors in the English Department will participate in the evaluation of the material written in English and will make comments to the students who wish to.
- At the beginning of each semester, professors in the English Department will hold a seminar for students in fourth grade and explain their evaluation criteria for oral presentations.
- Teachers of the English department will participate in the evaluation of the presentations by students and will be able to make questions and comments after the students´ performance.

The experience reported in this paper deals with the preparation, design and implementation of a rubric in the fourth year of the degree with the students who have to be assessed in their speaking skills. Two teachers belonging to the English department and four teachers from the Computer Engineering department were engaged. The English teachers had been engaged with the teaching of the English for Computer Science subject for more than 10 years, so, their knowledge and experience make them suitable for this collaboration. On the other hand, although content teachers admit they have not a high level of the English language but they are eager to participate in the project.

The cooperation between the members of both departments is carried out by several face-to-face meetings and several emails.

The score (12% of the final mark) is associated with the presentation in English in all the subjects including English assessment in the fourth year.

These presentations were assessed by both the content teachers and the English teacher. Presentations were in groups of 4/5 people and are closely related to a project associated with the technological content of the course.

B. The action accomplished in order to succeed in this association was:

Students are shown how to deliver proper presentations in English by means of explanations in class, helped by PowerPoints and by useful Internet resources in the virtual classroom, where students can get ideas in order to prepare their presentations. See appendix A.

Students, in class, are given strict instructions of the main structure of their presentations:
- Title and authors

- Index of the presentations
- Motivation (presentation of the case, context of technical proposal)
- Objectives: Requirements (the technical proposal)
- Theoretical framework (review of other works in this field)
- Methodology
- Results or data found in the course of the research (with examples)
- Conclusion
- References

Each member of the group had 5 minutes for the speech; therefore, as the groups were formed by 5 members, they had to prepare a 25-minute presentation. Afterwards, teachers could make questions if they considered so.

Both teachers, the content and the English teacher, explain the students the rubric they are going to use to evaluate their presentations. (Fig. 1)

CATEGORY	Excellent (10-9)	Good (8-6)	Fair (5-4)	Poor (3-0)	Comment
PRONUNCIATION (x2)	Pronounces all words correctly and speaks clearly. Appropriately uses correct vocabulary and grammar. Good fluency.	Pronounces most of the words correctly and speaks clearly. Uses some correct vocabulary and grammar.	Speaks clearly; mispronounces some words. Uses some correct vocabulary and grammar.	Difficult to understand, is struggling or mispronounces most words. Does not use correct vocabulary and grammar.	
VOCABULARY AND GRAMMAR (x2)	Appropriately uses correct vocabulary and grammar.	Appropriately uses correct vocabulary and grammar most of the time.	Sometimes appropriately uses correct vocabulary and grammar.	Rarely uses or doesn't appropriately use correct vocabulary and grammar.	
GRAMMAR MISTAKES AND TYPES (SLIDES) (x2)	The presentation has no grammar mistakes.	The presentation has no more than 2 grammar mistakes.	The presentation has 3 grammar mistakes.	The presentation has 4 or more grammar mistakes.	
CONTENT (x2)	Addresses all or more of the topics on the assignment sheet.	Addresses most of the assigned topics on the assignment sheet.	Addresses between 40 and 50% of the topics on the assignment sheet.	Addresses less of 40% on the topics on the assignment sheet.	
BODY LANGUAGE AND POISE	Student displays relaxed, self confident nature, with no mistakes.	Makes minor mistakes, but quickly recovers from them; displays little or no tension.	Displays some level of inflection throughout delivery.	Consistently uses a monotone voice.	
EYE CONTACT	Holds attention of entire audience with the use of direct eye contact.	Consistent use of eye contact with audience.	Displayed minimal eye contact with audience.	No eye contact with audience.	
USE OF GRAPHICS, TABLES AND IMAGES	Includes visual elements such as tables, illustrations and graphs. Images are relevant to the topic, have the right size, are of good quality and increase the reader's interest.	Includes visual elements such as tables, illustrations and graphs. Images are not relevant to the topic or do not have the right size.	The visuals are poor and do not help the presentation. The images are randomly selected, are of poor quality and distract the reader.	No visual elements.	
CREATIVITY	Presents the material creatively and spontaneously.	There is some kind of originality, with good choice of text and graphics.	Little or no variation; little originality and interpretation.	Repetitive with little or no variety.	
TOTAL SCORE: 120					

Figure 1. Rubric for English oral presentation in the fourth year in the computer engineering degree

C. All the items assessed in the oral presentations must be successfully explained to the students so as not to be misunderstood. We justified each item as follows:

Item 1: Pronouncing words in such a way that native speaker would understand what is being said. Pronunciation is a basic quality of language learning. Though most second language learners will never have the pronunciation of a native speaker, poor pronunciation can obscure communication and prevent an ESL student from making the meaning known. When evaluating the pronunciation of their students, teachers have to listen for *clearly articulated words*, *appropriate pronunciations of unusual spellings*, and *assimilation and contractions in suitable places*.

Item 2: *Vocabulary comprehension* and *vocabulary production* are always two separate banks of words in the mind of a speaker, native as well as second language. Students must be encouraged to have a large production vocabulary and an even larger recognition vocabulary. For this reason it is helpful to evaluate your students on the level of vocabulary they are able to produce. Are they using the specific vocabulary you have instructed them in this semester? Are they using vocabulary appropriate to the contexts in which they are speaking?. On the other hand, Grammar has always been and forever will be an important issue in foreign language study. Writing sentences correctly on a test, though, is not the same as accurate spoken grammar. As students speak, listen for the grammatical structures you have taught them. Are they able to use multiple tenses? Is word order correct in the sentence? All these and more are important grammatical issues, and an effective speaker will successfully include them in his or her language.

Item 3: Grammar mistakes in the slides: Visual aids are an important factor in a successful engineering or science presentation, and as a speaker, the student should

give careful consideration to visual aids. Unfortunately, many presenters rely on the default settings provided by PowerPoint to create slides for their presentations. Typically, this approach results in tiresome slides heavy with bulleted text and perhaps an occasional image. Grammar mistakes in the slides are considered as unacceptable as in the oral language.

Item 4: Content-related evidence refers to the extent to which a student´s responses or speech to a given assessment instrument; it also refers to the student´s knowledge of the content area that is of interest. (Moskal & Leydens, 2000).

Item 5/6 Body language, composure and eye contact: Being able to say what you mean with a foreign language is one thing, being able to interact and connect with others is another. Ask your students questions. Observe how they speak to one another. Are they able to understand and answer questions? Can they answer you when you ask them questions? Do they give appropriate responses in a conversation? All these are elements of interaction and are necessary for clear and effective communication in English. A student with effective interaction skills will be able to answer questions and follow along with a conversation happening around him. Great oratory skills will not get anyone very far if he or she cannot reach the audience. The speaker´s attitude is a very important factor to be taken into account when delivering a presentation.

Item 7: Use of graphics and figures: The primary purpose of the slides is to help the audience understand and remember the content. Normally, the information is presented in a sentence headline stating the main message of the slide but, in scientific presentations, that message assertion is supported *not* by a bullet list or isolated sentences, but by visual evidence: photos, drawings, diagrams, graphs, films, or equations.

Item 8: Creativity: A student may struggle with grammar and pronunciation, but how creative is he/she when communicating with the language he/she knows? Assessing students´ communicative ability means looking at their creative use of the language they do know to make their points understood. A student with a low level of vocabulary and grammar may have excellent communication skills if he/she is able to make you understand him/her, whereas an advanced student who is tied to manufacture dialogues may not be able to be expressive with language and would therefore have low communication skills. The more creative they can be with language and the more unique ways they can express themselves, the better their overall communication skills will be.

III. CONCLUSION

The collaborative experience was useful, productive and exceptional for all the teachers participating in the experience, even though we encountered some problems, we successfully reached an agreement. On the one hand, we did not belong to the same field of study, so we did not share the same conceptions and points of view about some specific aspects; and on the other hand, we had to determine the items assessed by each teacher. We negotiated all these issues in the meetings and emails and we came to the conclusion that the English teachers should evaluate the language part (pronunciation, grammar, etc.) and the content teachers, the content-related part.

A total of 54 students were assessed with the elaborated rubric designed for this purpose. After the exam, we asked the students if they had understood all the information provided for the oral examination and, all of them answered positively as being aware of the importance of the rubric to assess their performances in the oral exam.

Appendix A

Some of these useful links are the following ones:

http://www.businessenglishonline.net/resources/presentations-in-english-teachers-notes/
http://effective-public-speaking.com/
http://www4.caes.hku.hk/epc/presentation/default.htm
http://step.inpg.fr/GB/docs/Language_of_presentation_v7.pdf
http://www.etsu.edu/scitech/langskil/oral.htm
http://www.engr.psu.edu/speaking/Visual-Aids.html
http://www.writing.engr.psu.edu/slides.htm

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