

INTEGRATING DIFFERENT TYPES  
OF COMPETENCES IN A TECHNICAL  
COMMUNICATION COURSE WITHIN  
THE NEW EUROPEAN FRAMEWORK

Elisabet Arnó  
*Universitat Politècnica de Catalunya*



#### ABSTRACT

In the new European framework, university teaching emphasizes student learning and the development of different competences. This paper presents an ESP course for engineering students which integrates competences related to language and communication with competences related to the social, ethical, and humanistic dimension of the engineer. The course “Academic communication in English: science, technology, and society” aims at developing students’ communication skills in English alongside their critical thinking skills, through the exploration and discussion of topics related to science, technology, and society. This paper presents the rationale for the design and teaching of the course, which draws on several strands: the integration of content and language, EAP teaching, and the development of critical thinking skills. It is organized in the form of thematic units, each focusing on a topic related to the impact of technology on society. Each topic thus serves as a point of departure for dealing with content and academic communication in English. This paper tries to show how an EAP course can be related to the interests of engineering students, helping them develop their capacity for academic communication as well as for reflecting on issues related to science, technology, and society.

KEY WORDS: EAP, CLIL, critical thinking, academic communication.

## 1. INTRODUCTION

University education is undergoing a major transformation, and curricula are redesigned to achieve transparency and transferability, as well as to increase mobility and employability across Europe. The current reform involves a shift from teaching to learning, requiring students to take on an active role, developing autonomy and a capacity for life-long learning. Another keystone of the process is the promotion of foreign language learning, especially English, as a ‘lingua franca’. On the other hand, courses must be designed by specifying the learning outcomes that students are expected to attain, expressed in terms of different types of competences that are developed throughout the learning process.

This new framework calls for a reappraisal of approaches and practices in the teaching of ESP (English for Specific Purposes), which is currently at a crossroads. One could expect that the prominent role of English, being promoted as

the language of instruction in the progressive internationalisation of universities, should situate ESP teaching at the forefront. However, as Räsänen and Fortanet-Gómez (2008) point out in their review of the state of ESP across Europe, the situation is uncertain, and with different countries being at different stages in the development of the process, the debate on ESP is still open, with the integration of language and content being a main issue.

This paper presents the rationale for the design of an ESP course at Universitat Politècnica de Catalunya at Vilanova i la Geltrú (Barcelona). In the year 2006-2007, a new course was designed with an integrative approach for students of different branches of engineering. It was based on the combination of academic communication with interdisciplinary contents related to the impact of science and engineering on society.

## 2. INTEGRATING COMPETENCES IN THE NEW EDUCATIONAL CONTEXT

One of the keys of the Bologna process is that through university education, students are expected to develop different types of competences, both generic and subject-specific. In the design of this course and in order to specify the competences that would be developed, attention was paid to the guidelines for designing engineering curricula. It seemed appropriate to design an ESP course that combines academic communication with the capacity to reflect on issues related to science, technology and society. These competences appear among the learning outcomes defined by the ABET Engineering Accreditation Commission in the U.S and also as part of the 'Dublin' descriptors in Europe:

[...]

- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues

(2008: 2)

Qualifications that signify completion of the first cycle are awarded to students who:

[...]

- have the ability to gather and interpret relevant data (usually within their field of study) to inform judgements that include reflection on relevant social, scientific or ethical issues;

- can communicate information, ideas, problems and solutions to both specialist and nonspecialist audiences;
  - have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy.
- (2004: 2).

This course was designed with the aim of integrating different types of generic competences (González and Wagenaar, 2003: 71). These include instrumental competences (e.g. knowledge of a second language or communication skills); interpersonal competences, which include “the expression of social or ethical commitment”, in addition to cooperation and other social skills; and systemic competences, which “suppose a combination of understanding, sensibility and knowledge that allows one to see how the parts of a whole relate and come together.”

On the other hand, with regard to competence in English, for comparability and reference, the benchmark used is the Common European Framework of Reference for Languages (Council of Europe, 2001). The level is situated at B2, but it is the descriptors that are especially useful, which helped identify the learning outcomes, related to the integration of the skills of reading, listening, writing, and speaking (both production and interaction). For example, students are expected to read a technical text identifying stated ideas and establishing inferences, and then to participate in an oral discussion, presenting and sustaining their arguments.

### 3. COURSE DESIGN

Teaching ESP in an engineering programme allows for the integration of different competences so that students can use English for academic communication and, at the same time, for participation in society, being able to express informed judgments on science and technology. These broad aims inspired the course “Academic communication in English: science, technology, and society.” It was expected that through an ESP course with a focus on interdisciplinary content, students could be encouraged to keep abreast of events related to science and technology, to trace and relate historical developments, to explain scientific and technical advances with respect to their ethical underpinnings, as well as to express arguments on the impact of science and technology on our lives.

Thus, taking an overall perspective on science and technology in society, this course complements the specialized content offered in subject-matter courses. Since it is an optional course for students of different engineering degrees, its interdisciplinary approach provides an open-ended and richer perspective. The syllabus is based on thematic units, focusing on topics that explicitly relate sci-

ence and technology to society. The point of departure for designing the course and, thus, for selecting the teaching units was the material prepared for a web-based learning environment which we are currently developing as part of an interuniversity project, called “Quantum LEAP (Learning English for Academic Purposes)”, see Arnó et al. (2009). This learning environment consists of different thematic modules with authentic written and oral texts and includes activities to develop the skills of reading, writing, listening and speaking. The modules in “Quantum LEAP” focus on topics of general academic interest from an interdisciplinary perspective, and for this course, a selection was made among those modules focusing on science, technology, and society. The following modules were selected: women and science, humans and machines, environmentalism, and science fiction.

In the course, each unit was approached from the perspective of content, using the written and spoken input texts as a springboard for analysis and reflection on the topics proposed. With regard to the integration of EAP skills, students engage in academic activities such as interpreting the texts, academic writing, or giving oral presentations, for example. Following the integration of competences promoted in the reform, the design of this course is based on several strands, namely EAP, critical thinking, and the integration of language and content.

#### ENGLISH FOR ACADEMIC PURPOSES AND CRITICAL THINKING

This course can be characterized as an EAP course, to help students communicate in academic settings and deal with specific activities of the academic community (Jordan, 1997; Hyland & Hamp-Lyons, 2002). There is a debate on whether EAP teaching should focus on common core academic skills or whether it should concentrate on specialist texts (Flowerdew and Peacock, 2001; Hyland, 2002). Because this course is addressed to students of different disciplines, we use a variety of genres of academic interest, but in general, the texts are not addressed to a specialist audience. In line with current EAP pedagogies (e.g. Dressen-Hammouda, 2008), this course integrates genre with a process approach, using typical genres in academic activities, such as essays, lectures, or articles. In the context of the European reform, which stresses autonomy and lifelong learning, our approach to EAP includes the development of awareness (language, genre, and learner) and the promotion of self-study and self-assessment.

Because of the nature of this course, the notion of awareness includes a broader understanding of our social context, and critical thinking lies at the root of course activities. In fact, critical thinking is closely related to EAP, since activities like evaluating, problem-solving, and posing questions are inextricably linked to academic life. In particular, Benesch (1999) points out that critical thinking can empower students and that “dialogic critical thinking” allows them

to discuss, question, and reformulate their views. Relating critical thinking to EAP, Pally (1997: 306) argues for an approach based on the integration of language and content, so as “to allow for the synthesis, questioning and evaluation of information of information, the study of rhetorical conventions of a genre, and a recycling of those conventions into student writing [...]” Precisely, the integration of language and content plays a key role in the design of this course.

#### INTEGRATING LANGUAGE AND CONTENT

Within the new framework, universities are promoting the use of English as a medium for teaching content. The question is how this integration should be approached and what roles should be assumed by teachers of language and of discipline content (Dalton-Puffer, 2007; Räisänen & Fortanet-Gómez, 2008). Mehisto et al. (2008) identify two types of integration, namely dealing with language in content classes and using subject-matter content in language classes, usually with the collaboration of specialist teachers. The approach adopted in our situation is to focus on content in an ESP course —although, as mentioned above, this content is related to a general humanistic and social perspective of science and technology rather than to specialist subject-matter. Accordingly, this course is not presented as a language course, but rather, through the medium of English, it addresses the relationship between science, technology, and society, so as to help students reflect on the origins and impact of engineering as well as to enhance their capacity to discuss such issues in a broader context than that of specialist courses. In this sense, through authentic written and spoken texts of academic interest, students establish relationships between different topics and discuss their implications.

Focus on content is combined with EAP teaching using a focus-on-form approach (Doughty & Williams, 1998). Language is dealt with as needs arise during communication and to provide students with the necessary guidance to understand and produce academic texts in English. In the integration of language and content, focus on form can make language salient and help students in the learning process, by alternating attention to language with a focus on content (Lyster, 2007). This approach is reflected, for example, in activities that involve a discussion which students then elaborate upon to prepare an academic essay. Parallel to a focus on content, instruction is provided on aspects like the writing process, text structure, and the language involved in academic essays. Thus, through the integration of language and content, we provide a framework for the use of language in real communicative situations, motivating students to accomplish tasks through English (Dalton-Puffer, 2007; Mehisto et al. 2008). The integration of language and content can also be valuable for EAP, as we situate academic work in the broader context of communication in a real discipline-related study setting, developing students’ academic literacy (Garner & Borg, 2005).

#### 4. METHODOLOGY

According to the main strands above, course methodology stresses the presentation and discussion of content through authentic input texts. Because of the nature of the course, the relationship between the lecturer and students is more symmetrical than in other courses, and the lecturer adopts the role of a moderator or guide rather than that of an expert. Therefore, the lecturer poses questions and provides a framework for the activities, but it is the student's responsibility to find out, interpret and elaborate on the information. Each unit begins with prompt questions that encourage students to think about the topic. They find out information through the input texts proposed—being encouraged to investigate further—and participate in discussions as well as in other academic activities.

EAP teaching involves a focus on genre, communication skills, and language, which ranges from guidance on preparing oral presentations, to solving language problems in the communication process. For example, in the unit on “humans and machines” several genres are used: a journal article on the Internet and communities, a newspaper article on home automation, and a lecture on computers with a humanlike interface. Apart from focusing on how technology shapes our lives (e.g. our dependence on technology, home automation for the disabled, or the creation of virtual and physical communities, for example), there is a focus on the different genres, on audience and purpose, and on how these considerations influence the organization and language used in the texts. With these topics, students participate in debates, search for information, and produce an argumentative essay. In the module on science fiction, they are asked to read a science fiction work (either original or abridged) and explore the social, historical, scientific or ethical concerns depicted in it, and then prepare an oral presentation on their work.

Apart from being the subject matter, technology also plays a key role in course activities. The Internet is used as a source of information and a communication tool, both within and beyond the classroom. The use of the learning environment “Quantum LEAP” facilitates self-access work, which allows participants to devote class time to analysis and reflection activities. Another example of a technology-related activity was a virtual exchange with a group of students of International Marketing in California (2006-2007), in which, through computer-mediated communication, they participated in focus groups to help the U.S. students design an advertising campaign. The activity allowed students not only to improve their communication skills, but also to reflect on issues related to globalization, intercultural communication, and computer-mediated communication. Course activities are thus open-ended, designed to promote further inquiry, critical thinking, and autonomy.

## 5. FINAL REMARKS

As it was recently implemented, this course should be assessed and adjusted. Its open-ended nature makes it dynamic, so the activities and the pace of the course may vary from one edition to another, depending on students' interests and needs. However, after three editions, the perception is that the course is positively viewed by students, who consider it enriching because it provides them with a new perspective on science and technology and it helps them use English for authentic communication. As one of them put it, "this course helps you think in English." A more thorough evaluation process will allow us to gather more information about students' profile, the contents dealt with in subject-matter courses, as well as their interests and needs. Within the new framework, we also need to find out what competences students develop through the course and how they relate to the overall competences that they need both in their studies and in their future professional practice.

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