

CLIL Implementation applied to Mathematics for Engineering

Francisco J. Rodríguez Sánchez (1)
María Salomé Yélamos Guerra (2)
Francisco J. Ruiz Rey (3)

(1) Dept. Matemática Aplicada.
(2) Dept. Filología Inglesa, Francesa y Alemana.
(3) Dept. Didáctica de las Matemáticas, de las Ciencias Sociales y de las Ciencias Experimentales.
E-mail: fjrodri@uma.es
Universidad de Málaga. Spain.



OBJECTIVES

- CLIL methodology (Content and Language Integrated Learning) aims to facilitate the learning of specific contents in English.
- Due to the inconvenience of forming full teaching English groups, we try to integrate the concepts and terminology of mathematics in the target language but maintaining the lectures in Spanish.
- To facilitate and improve the integration of international students in these subjects.
- To improve the knowledge of our students in order to enhance mobility to other universities where English is the main language.
- To prepare teaching material in English.
- To evaluate using tests developed in English. Not all students have the same level of English, so they have the opportunity to be evaluated in Spanish.

METHOD

- This implementation has been developed through two academic years in some degrees from the Industrial Engineering School and Telecommunications Engineering School at the University of Malaga. It can be delimited within the framework of the UMA Educational Innovative Project PIE17-181.
- As shown in Figures 1 and 2, many of the students already accredit an adequate level of English for this experience, but some others do not have enough English level to follow without difficulties full teaching sessions in the target language. By maintaining the lessons and assessments in Spanish, we have gradually integrated materials such as notes, summaries, exercises and projections, all written in English.
- In general, students find this type of initiative interesting and necessary (Figures 3 and 4), since it benefits them without hindering the learning of Mathematics contents.
- As the teaching language is Spanish, the activities that take place in English are of a voluntary nature. These activities are based on the development of online projects and non-final evaluations. The final exam is taken in Spanish, but students can answer in English.
- The use of ICTs has been important for the development of this implementation. In future we will incorporate some videos with part of the lessons in English.

RESULTS

- This methodology provides an improvements in the student's English language, mainly in the field of scientific/technical terminology, without loss in the specific content to mathematics.
- A lot of teaching material has been created.
- The following figure shows the proportion of failed/passed students in a content test within a group. The choice of language was voluntary. Note that the results are not statistically significant.

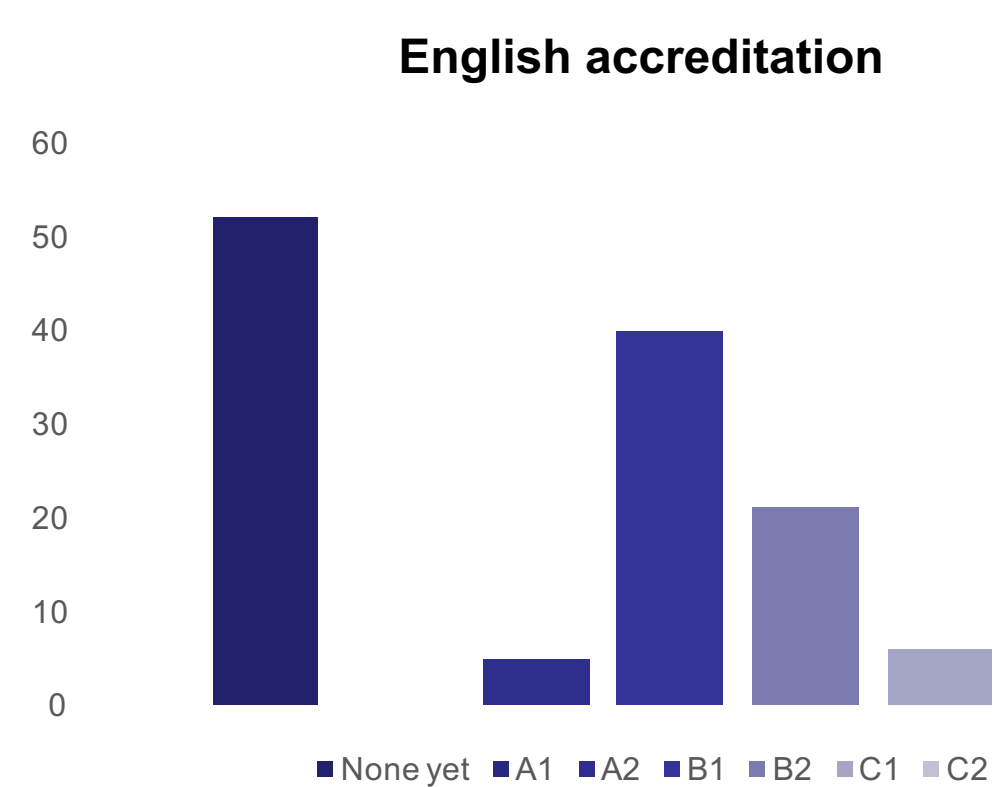


Figure 1

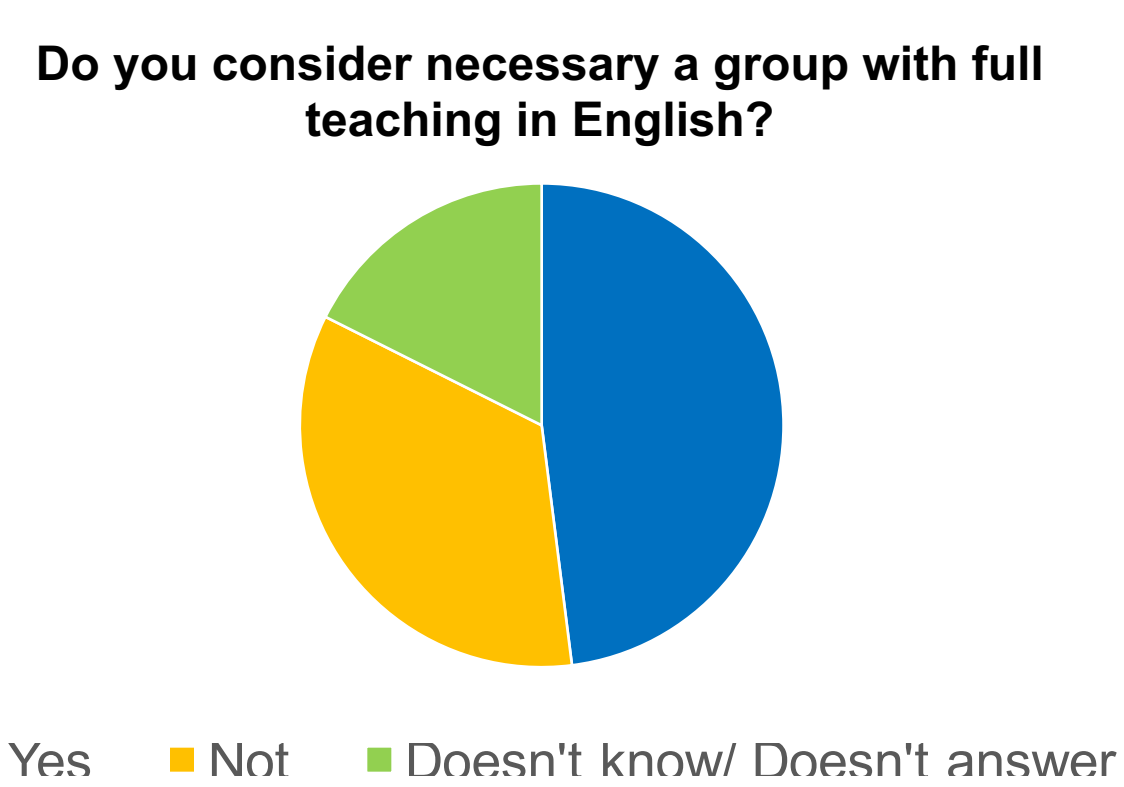


Figure 3

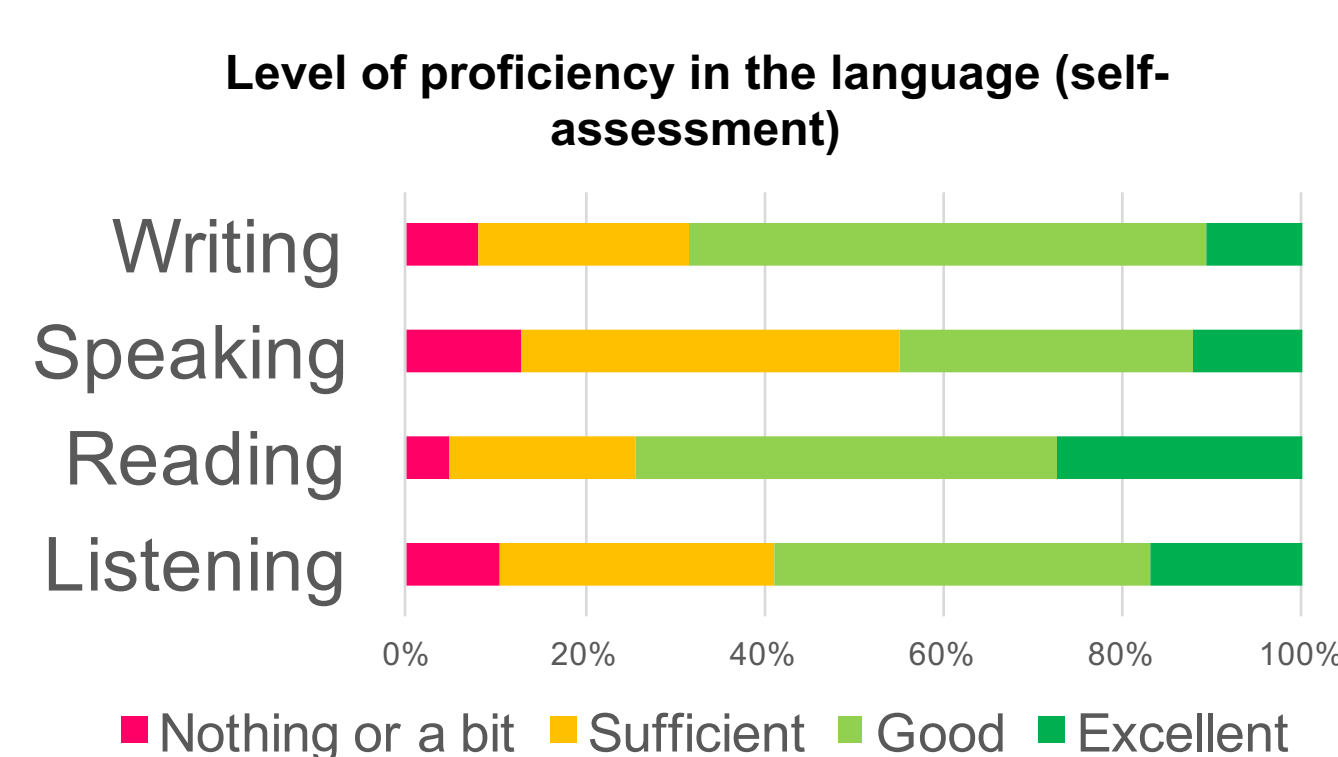


Figure 2

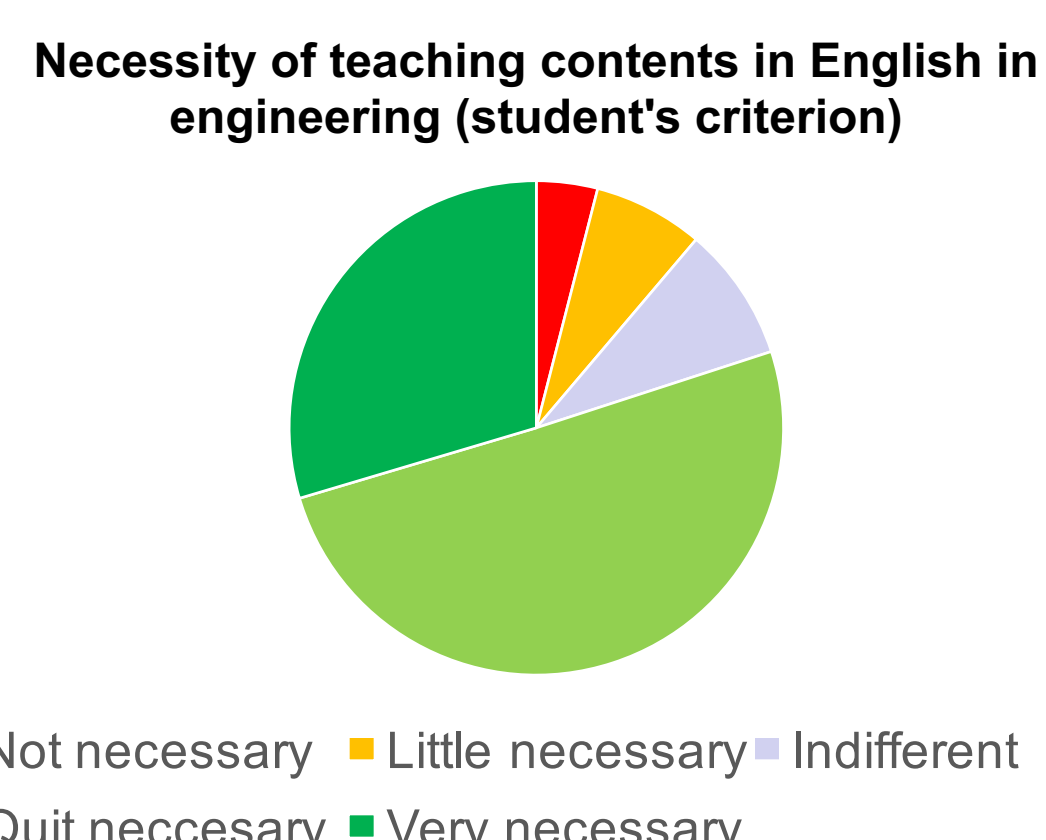


Figure 4



Figure 5

CONCLUSIONS

- The experience is well received by the majority of students who do not perceive any added difficulty in having both the bibliography and the teaching material in English.
- In the last course there was only one content test in which one could voluntarily choose to take it in English or Spanish (the same test). A minority chose the first one and the results were slightly better. We think that more self-assured students tend to have better grades.
- We believe that the results are positive and we will continue with the experience and increasing the creation of teaching material in English.
- The ultimate goal is to form full teaching English groups in the subjects in which the experience is developed.

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