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ERASMUS EXPERIENCE BETWEEN THE UNIVERSITY OF CADIZ (SPAIN) AND THE UNIVERSITY OF ALGARVE (PORTUGAL)

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Abstract

A mobility program was carried out during the last two years between the Universities of Cadiz (Spain) and Algarve (Portugal) under the EU funded Erasmus+ Mobility for Teaching. The objective of the mobility was twofold: on one hand, it included the strengthening of the existing scientific cooperation between the University of Cadiz (home institution) and the University of Algarve (host institution) in the field of the Gulf of Cadiz Physical Oceanography; on the other hand, it pretended to improve the teaching quality, focusing on both the lecturers and the students. Both institutions have long ties of cooperation that have recently been intensified under the umbrella of the International Campus of Marine Excellence (Ceimar). Specific objectives oriented towards the lecturers included the exchange of teaching experiences among them as well as the comparison of teaching strategies and methodologies between the host and home institutions at the Master level in order to evaluate and enhance the best teaching practices with the aim of improving the students learning process. Specific objectives oriented towards the students included: (1) to provide local students that cannot afford studying a Master degree abroad with a foreign teacher in the discipline that will offer them different added expectations; (2) to teach students different subjects from those taught at the host institution, thus benefitting from new scientific knowledge and experiences. It must be pointed out that the subject taught by the home institution lecturer represents a competence lacking at the host institution, hence complementing the program of the discipline and providing an added value to the Master degree. Informal questionnaires carried out among students by the host institution revealed that they evaluated having a foreign teacher as a very positive experience. In terms of research, collaboration among both institutions is of great importance because they are both located within the same geographic region and hence, they share common interests. The mobility promoted finishing on-going collaborative publications as well as sharing new research experiences, data and knowledge, hence leading to an improvement of the Physical Oceanography state-of-the-art in the Gulf of Cadiz. In fact, two scientific papers on the Gulf of Cadiz circulation system and two on the storm climate along the Gulf of Cadiz and its relation with coastal hazards have been recently published as a direct result of the mobility program.

Keywords: Erasmus+, Physical Oceanography, Gulf of Cadiz, Cadiz, Algarve.

1 THE ERASMUS+ STAFF TEACHING MOBILITY PROGRAM

The ERASMUS+ Program is an opportunity for academic staff to teach at a European partner institution. Although the main objective of the Program is for staff to learn from and contribute to best practice, research networks are often created or strengthened during the staff visit. Visiting lecturers are expected to strengthen the internationalization of the host and home universities, complement the lectures taught at the host institution, and offer their expertise to students who cannot or do not wish to study abroad. In this paper we present the outcomes of two visits carried out under the ERASMUS+ Staff Teaching Mobility Program during the academic years 2014-2015 and 2015-2016 to teach at the "Master Programme in Marine and Coastal Systems (MaCS)". The sending (home) institution was the University of Cadiz (Spain) and the host institution the University of Algarve (Portugal). Both institutions have a long history of cooperation, both in terms of research and PhD students' mobility, which was recently intensified through the creation and partnership of the International Campus of Marine Excellence (Ceimar). Furthermore, the two institutions are also cooperating through another modality of the Erasmus program, namely, the 'Joint Erasmus Mundus in Marine and Coastal Management'.

The mobility had two main objectives: on one hand, and following the focus of the ERASMUS+ Program, it pretended to improve the involved lecturers teaching skills as well as the students' education; on the other hand, it aimed at strengthening the existing scientific cooperation between both institutions in the field of the Gulf of Cadiz Physical Oceanography. Specific objectives oriented towards the lecturers included the exchange of teaching experiences among them as well as the comparison of teaching strategies and methodologies between the host and home institutions at the Master level in order to evaluate and enhance the best teaching practices with the aim of improving the students learning process. Other specific objective was to take advantage of the scientific collaboration and complementary interests of the host and home lecturers to bring to the classroom results of novel research in the northern margin of the Gulf of Cadiz.

Specific objectives oriented towards the students included: (1) to provide local students that cannot afford studying a Master degree abroad with a foreign teacher in the discipline that will offer them different added expectations; (2) to diversify the syllabus through the introduction of more teaching contents so students could benefit from new scientific knowledge and experiences. It must be pointed out that the subject taught by the home institution lecturer represents a competence lacking at the host institution, thus complementing the program of the discipline and providing an added value to the Master degree; and (3) to expose them to lessons being taught in English, so they can familiarise themselves with the most relevant scientific terms within their discipline. This last objective only concerned the academic year 2014-2015 that only had local students; the following year (2015-2016) the MaCS held international students and hence, all lessons were taught in English.

Specific research objectives focused on maintaining existing cooperation networks with researchers from the host institution as well as opening new ones. It must be pointed out that collaboration among both institutions is of great importance because they are both located within the same geographic region and hence, they share common interests. More specifically, both universities are located within the Gulf of Cadiz (GoC), the basin that connects the Mediterranean Sea with the Atlantic Ocean. The GoC forms a highly interesting and complex basin, with an intricate local circulation system strongly influenced by the Mediterranean inflow/outflow and the wind regime; it has long been a region of particular interest to oceanographers, not only because of its complex circulation patterns but also because of its great diversity in commercially exploited species whose abundance and distribution is highly related to the environmental characteristics. Hence, it is expected that sharing research experiences, data and knowledge from both institutions will lead to an improvement of the state-of-the-art in this region. The ERASMUS+ experience also provided the opportunity to build the bridge between research and education through the use of data and results from the state-of-the-art research in the GoC in the setup of the computer laboratory material.

2 METHODOLOGY

2.1 Education

The experience focused in the curricular unit entitled "Large Scale Ocean Processes" (Master Programme in Marine and Coastal Systems - MaCS). The purpose of the unit was to provide the students with the knowledge of the fundamental principles of ocean physics. They should understand the basis of the physical functioning of the ocean to be able to use them in interdisciplinary issues when they are placed. The complete MaCS program lasts for two academic years. The overall workload of the curricular unit per academic year is 30 hours of theoretical lectures and 18 hours of theoretical-practical lessons, with another 118 hours of autonomous work by the students. The lessons taught by the host lecture were in Portuguese during 2014-2015 and in English during the 2015-2016 academic years. The curricular unit has a strong component in terms of the concepts and analytical and/or conceptual models of the physical functioning of the ocean and their interaction with the atmosphere. These theories are well established and the students need to master them before accessing the more advanced and interdisciplinary matters. The more coherent teaching method to achieve the goals is an expository methodology of knowledge transmission in most classes. The lessons included in the ERASMUS+ exchange clearly complement this methodology, bringing new experiences and a pluridimensional characteristics to the Master's degree and to the curricular unit in particular.

The home lecturer lessons were taught following the CLIL (Context and Language Integrated Technique) method in which the home lecturer received specific training as part of a specialising course entitled "English for Marine and Environmental Sciences" that included using the methodology

during real lessons [1]. Furthermore, the fact that the home lecturer worked as a Marine Scientist in the United Kingdom for five years, ensures a deep knowledge of the most relevant scientific terms within this field. CLIL is an umbrella term implemented by the European Network of Administrators, Researchers and Practitioners (EUROCLIC) [2] in the mid-1990s with the clear vision of creating a multilingual Europe in which people spoke more than one language. It embraces any activity in which a foreign language is used as a tool to learn a content-based subject (e.g., physics) and, at the same time, learning a foreign language by studying a content-based subject [3]. This way, students are more motivated to learn a foreign language because they can immediately use their language skills within the lessons.

The home lecturer taught a total of 24 hours evenly distributed among the two academic years. During the first year, the lectures were divided into three sessions of four-hour duration each, separated among them by about two weeks. During the second year, the lectures were divided into four sessions of three-hour duration each concentrated in two intensive (morning and afternoon) days. Each session was structured into a theoretical and a computer laboratory module. During the theoretical module, the lecturer provided students with specific knowledge about the subject in a master class way. During the computer laboratory module, the lecturer gave the students real data and Matlab programs and functions and instructed them on how to perform the required data analysis and how to interpret the results obtained following the theoretical concepts learned. For this purpose, each student had a computer with the necessary software installed. The aim of this structure was to teach new concepts and apply them immediately to a real case scenario, incrementing the complexity of the subject in a progressive and practical way, so the students could secure each new concept before being exposed to a new one. Moreover, and taking into account that MSc students are potential future researchers, they were taught several Matlab technical skills for producing scientific figures and graphics.

During the first academic year (2014-2015), students were evaluated through a written exam. The questions were written both in English and Portuguese, the latter being the official language of the host institution, and consisted in various real-case scenarios that the students had to analyse and discuss basing their answers in the theoretical concepts learned. They were given the opportunity to choose the language they wanted to answer the questions with no influence on the final mark. In the academic year 2015-2016 the evaluation frame was maintained, but only in English, due to the international diversity of the students.

Finally, students from both academic years were asked to fill a short and anonymous questionnaire about their learning experience with the foreign lecturer.

2.2 Research

The existing but weakly maintained scientific cooperation between the home and host lecturers gave rise to the first ERASMUS+ visit. The visit was structured to allow time for scientific meetings before or after the lessons with the aim of finishing on-going collaborative publications and/or introducing the home lecturer to other researchers from the host institution. The later represented a unique opportunity to share and evaluate existing knowledge, find common research interests and discuss new ideas.

3 RESULTS AND CONCLUSIONS

3.1 Educational outcomes

Approximately 90% of the students that did the exam wrote their answers in their home language (Portuguese) and only 10% wrote them in English. This suggests that, although they felt comfortable to be taught and ask questions during the lessons in a foreign language, they didn't have time to assimilate the terminology with the level required to properly express their knowledge in the exam. Nevertheless, they all evaluated being taught in English as a very positive experience.

The visiting lecturer elaborated a short and anonymous questionnaire for the students to gather their opinion about the visiting lecturer. The first two questions aimed at evaluating the percentage of lessons taught by the visiting lecturer they had attended and whether they had found the subject interesting. Since all the students that answered the questionnaire had attended all the lessons and all of them found the subject interesting, their answers to the rest of the questions can be treated in the same manner. The remaining questionnaire consisted in three multiple choice questions focused on evaluating the contents of the subject taught by the visiting lecturer and the distribution of the lessons.

The first one asked if the subject provided and added value to the MaCS program and gave the following four choices: (1) Yes, because it was different from the subjects taught at the University and it provided new knowledge; (2) Yes, because we learned new skills; (3) No; (4) Other. About 53% of the students gave only one answer; among them, 80% chose option (2) and the remaining 20% gave a personal reply (option (4)) that included, increasing their already existing knowledge in the topic and helping them to better understand contents from other subjects or the linkage among them. The latter brings to light the interdisciplinary characteristic of Oceanography and the importance of studying it from different points of view. Only one of the students provided a negative answer, claiming that the time schedule of the lectures was too limited. Finally, from the 47% that gave multiple answers, the majority of them (60%) selected options (1) and (2) together. Overall, the students' answers to this question revealed that the first two objectives oriented towards them were fulfilled. It must be pointed out that many of them took advantage of the visiting lecturer transient situation to ask doubts about other subjects during the breaks. In this regard, students are often embarrassed to ask questions to their lecturer fearing that him/her might penalize their lack of knowledge in the final evaluation. Hence, having a temporary lecturer was felt as a good opportunity to feel free to ask even very basic questions.

The second specific question asked which part of the lectures the students found more interesting. The possible answers were: (1) The technical aspect of the Matlab exercises; (2) The regional focus of the content (Gulf of Cadiz); (3) The scientific contents; (4) Other. Only 20% of the students gave one answer that was option (1) in all cases. The rest of the students chose multiple options; among them, the most popular (50%) was the combination of options (1) and (3), followed by options (1), (2) and (3) (25%), options (2) and (3) (17%) and, finally, options (1) and (2) (8%). Overall, what students appreciated more were the technical aspects of the Matlab exercises, followed by the scientific contents. This highlights the fact that students expect a Master degree to prepare them as professionals for the real world. Being a scientific MSc, the most probable destination of students will be academic or private research and hence, it is important to train them not only in scientific knowledge, but also in specific technical skills related with such knowledge.

The last question was aimed at students from the second visit (academic year 2015-2016) and asked their opinion about concentrating the classes in just few intensive days. The possible answers were: (1) I liked it because I could focus on just one subject; (2) I didn't like it because it was too intense and I didn't have time to assimilate the contents; (3) Other. Most of the students (93%) gave only one answer; among them, 79% chose option (1), 14% selected option (2), and 7% picked option (3) suggesting that the same should be done with other subjects. The 7% remaining chose options (2) and (3) claiming that such concentration is only useful when the student has the sufficient background knowledge and technical skills. The majority of the answers were positive (80%) and indicates that most students prefer to focus on one subject rather than being taught many different subjects on a daily basis as it is usually the case. The negative answers are a direct reflection of the Bologna Process. In this respect, some of the students did not have a Bachelor's Degree in Marine Science and hence, lacked the necessary background knowledge to study such a specialized Master's Degree in Marine Science.

3.2 Research outcomes

Although nowadays a great part of the collaborative research can be done remotely, sometimes the every-day workload results in a continuous postponement of the virtual partnerships. In this sense, the meetings carried out during the mobility promoted finishing two on-going scientific publications dealing with the storm climate along the Gulf of Cadiz and its relation with coastal hazards [4,5]. Furthermore, the establishment of new collaborations within the host lecturer research network also lead to the publication of two scientific papers on the Gulf of Cadiz circulation system [6,7] and to future publications currently under preparation. As a conclusion, it should be mentioned that the ERASMUS+ mobility has led to an improvement of the Physical Oceanography state-of-the-art in the Gulf of Cadiz. As a continuation of the above research collaboration a number of common project proposals are under preparation for different calls.

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