# Informatics at the University of Alicante: Mobility Program Experiences

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## Abstract

In this paper we present some experiences with the Erasmus program in the Informatics Faculty of the University of Alicante. The topics presented are related with different aspects of mobility. First, teaching staff experiences in Sweden and United Kingdom universities. Second, coordination of mobility programs for students support in national, European and specific programs with other international universities. Finally, teaching of Internet programming subject for foreign students.

*Key words: ERASMUS program, Teaching staff, Mobility coordination, Multicultural teaching*

## 1. Introduction

Over the last 10-15 years international student mobility has become increasingly important part of the global higher education landscape. Short-term intra-European student mobility spread substantially as a consequence of the establishment of Erasmus program in 1987. The number of students annually supported increase from about 30,000 around 1990 to almost 150,000 in 2004.

The ERASMUS Program (European Region Action for Scheme the Mobility of University Students) main goal is to cover the needs of education and learning of all the participants in higher education institutions, whatever the studies duration or qualification, including the doctorate studies, as well as to support the institutions that distribute this type of formation.

By means of this Program the students of the Spanish universities can follow a part of their studies in European universities with which it had been subscribed exchange agreements of students. This exchange will be made with the aim of obtain academic recognition and profit, as well as of adjustment to its curricula.

It is also important to facilitate the exchange of students and teachers among the Spanish universities. According to [1]:

1. The promotion of systems that facilitate the mobility of the students promoting the development of interchange programs is one of the most effective manifestations of the interuniversity cooperation for the improvement of the quality of the education, to the benefit of the students.

2. The establishment of exchange programs between the Spanish universities, that complement the international exchange programs already developed, has a high formative value to make possible that the students participate and undergo different educational systems and to promote the knowledge of social and cultural aspects of other communities.

Various evaluation studies [2-4] have shown almost all participating students are highly satisfied with the ERASMUS experience in another European country. On average, they believe that their study progress abroad was higher than during a corresponding period at home, and many students report a substantial enhancement of proficiency in the host country language. Studies addressing the professional impact on short-term mobile students in Europe show that the study period abroad turned out to be helpful in the job search process.

The European Union has decided to extend and to expand its support for student mobility. ERASMUS will continue as sub-programme while the name of the umbrella educational sup-port programme will be Life Long Learning programme. The number of European students awarded ERASMUS support might double in the next few years.

In this paper different experiences related to students and teachers mobility in the European space of higher education frame are described. The remainder of the paper is organized as follows: in section 2 the benefit of experiences of teachers of the University of Alicante (UA) that developed Teaching Staffs in different countries are described. Section 3 presents aspects related to the management of Exchange programs in the field of Computer science and Telecommunications. In chapter 4 the experience teaching a subject of Computer science for students coming from different nationalities and with different background is described, followed by our major conclusions.

## 2. Teaching Staff

The mail goal of the Teaching Staff (TS) program is to contribute, through a better mutual knowledge between the university communities and the progressive harmonization of its curricula and educational methods, to a greater interrelation between the European

universities and institutions of education and to the creation of the European Space of Education Superior (ESHE) [5].

During the TS stay of our teachers in an institution partner, the invited teacher should teach in a program or subject of an official degree in this university according to a program of education (Teaching Assignment) previously established. In this way, the invited teachers will have the opportunity to know better the institution, teachers and the characteristics of the studies. They can also intensify the educational collaboration and, additionally, promote other projects of European programs as well as develop joint research projects. The educational stay of the teaching staff also can contribute to improve mobility of students (Student Mobility) since the teaching staff can contribute to the academic and institutional information of the foreign university that results in student mobility (recommendable studies, academic recognition of the studies, difficulties of students, level of languages demanded and many others)

Reception in the UA of European teachers by means of ERASMUS TS program is also very beneficial. Teaching by staff visitor coming from an European university can generate an added value to a subject of an official curriculum, because the students of the UA will have the opportunity to work with different educational methodologies, to appreciate the necessity to communicate or to read bibliography in a foreign language or to obtain any kind of information about the university from which the professor visitor comes.

The experience of teachers from UA in the University of Westminster (United Kingdom) and University of Skövde (Sweden) allowed the exchange of knowledge by teaching experiences: methodologies, contents, environment, students or evaluation. Both experiences take advantages with the direct interaction with teachers and students that use different ways to teach, evaluate and many others.

In the case of the TS in United Kingdom, the main goal was that students understand basic topics about artificial neural networks (ANN). More specifically the application of these neural networks to computer vision tasks like: objects tracking or man-machine interfaces. The lessons were included in the subject: Sc Biometrics Identification Systems Modules on Visual Recognition Systems / Usability and Man-Machine Interface

The lessons consisted in a theoretical part with new technologies support for presentations with videos and a practical demonstration with ANN simulation software developed in the UA. This was the schedule:
Session 1: Introduction to Artificial Neural Networks (ANN) (1h)
Session 2: Computational Geometry (2h)
Session 3: Applications of ANN in Vision (2h)

Teachers from UA also participated in research workshop organized for Phd students of the University of Westminster. The experience was very positive and both universities have

established a collaboration program that includes teaching and research aspects. We have also learned a lot about promotion of the university and we have created a periodical publication (http://revista.eps.ua.es/) based on this experience.


## 3. Mobility Coordination

The work o a faculty mobility coordinator is of vital importance in the development of the students and teachers exchange programs. More specifically, the tasks carries out by this coordinator in the University of Alicante are:

1. To propose to the dean of the faculty new agreements of international exchange and cooperation with foreign universities and the cancellation of the already existing ones if necessary. Reporting to the Director of the UA Socrates program about the implantation and development into the agreements subscribed with the foreign universities, as well as to collaborate in the development of the Socrates Program actions.
2. To select the students who are going to study in the frame of the international exchange agreements and make with them the studies program to develop by the student in the foreign institution, guaranteeing the non-duplicity of the curricular content, and to sign the learning agreements. Deciding equivalences in the qualifications.
3. To help, inform and to advise the own students and to the invited ones.

The accomplishment of these tasks requires a deep knowledge of the curricula of the studies of Computer science and Telecommunications. Also, it requires a suitable knowledge of the university systems of other European countries. Finally, a deep knowledge of the implantation of the European Space of Higher Education is required.

In the last years the Polytechnic University College in the UA have sent about 60 students of Informatics to universities of Germany, Austria, Bulgaria, Cyprus, Finland, France, Greece, Holland, Ireland, Italy, Norway, Poland, United Kingdom, Sweden and Turkey. We have also received about 50 students from these countries.
From data collected in the last years we have developed an application able to generate statistics from equivalent subjects in different universities and electronic management of learning agreements (figure 1). Our students can access statistics about past years and blogs and forums from old Erasmus students are available to help them. Most faculties in the UA and other universities have shown interest in this software.

Figure 1. Learning agreement management application.

## 4. Teaching to Multicultural Students

Within the LLP (Lifelong Learning Program), the University of Alicante maintains agreements Erasmus with 371 institutions higher education, which continue to highlight France, Germany, Italy and United Kingdom, receiving and sending more than 600 students, 4th in Spain.

A number of recent works presented studies about student mobility and collaborative learning remarking the obtained benefits [6-7].
In this section we present the objectives, contents and methodological aspects of teaching and evaluation of the subject Internet Programming Course [8] at the UA (subject for students Erasmus coming from different countries and with different background). We insist on the method of evaluation by means of presentations of works carried out by the students and participation in the classroom for greater integration of students of different nationalities and studies.

Internet Programming Course is included within the elective subjects for the students of the UA and students of the Erasmus program. This subject consists of 3 credits of practice and 1.5 of theory, and it is available to anyone of the degrees supplied in the UA, as well as for any international student.

**4.1. Goals**

Considering the motivation, participation and communication between the students like implicit fundamental elements in the subject, that in our case generates an extra contribution provided by the students of different nationalities, we detail the objectives:

- To provide to the students a general vision of the Internet.
- To introduce the Web concept and the programming languages of Internet.
- To practice with exercises that accompany the previous point to help to understand the concept of server and different situations related to the Internet.
- To handle graphic design programs, their integration with the rest of applications and its operation in the Web.
- To introduce the concepts of databases and their use in the Web to create dynamic pages with access to databases servers.
- To create and to manage a website with all the concepts learned during the course.

The global objective of the subject is the creation of one website including the administration and maintenance tasks. Different websites are presented to provide ideas and to offer possible improvements. In addition, the students present webs created in different countries, as a result of the plurality of nationalities of the different students from the course, to enrich the diversification.

**4.2. Contents**

The subject is divided in two parts: 2 hours of theory and 3 hours of practice a week. Both, theoretical and practice contents are related.

*4.2.1. Theoretical contents*

The theoretical contents have been divided in 9 chapters. The first two chapters introduce some general concepts about computer science and the Internet. Chapters 3 to 5 describe the creation of a basic Web that is improved later by means of forward elements that are included in chapters 7 to 9. Contents have been extracted, basically, from books and reference manuals on design and implementation of Webs. The temporary sequencing of the theoretical contents of the subject is described in Table 1.

| Theoretical Content | Duration |
|---|---|
| Hardware and software topics about the Internet. | 2h |
| Basic topics about the Internet. | 2h |
| Starting to create a web page. | 2h |
| Layout and Navigation. | 2h |
| Special Elements. | 2h |
| Internet applied in other major fields. | 1h |
| Introduction to graphic programs | 3h |
| Introduction to the databases | 2h |

| Working with dynamic data and databases. | 4h |
|---|---|
| Total | 20h |

Table 1. Theoretical contents.

### *4.2.2. Practical Contents*

The subject is mainly oriented to practical aspects, realising the sufficient practical hours to assimilate the theoretical concepts. All these practical developments will be applied to a website chosen by the student. We try that groups of two students come from different countries to stimulate their internationalization.

## 4.3. Evaluation

The evaluation is based on a practical part and an exam to evaluate the theoretical concepts. We also evaluate participation and evolution of their websites in time.

*Practical part*: Presentation of their website to the rest of the class. The value of this part that include presentation and evaluation of quality of the web will be of a 70% on the total value of the note. The students must set out the work carried out during the course, specifying the tools uses, the form of selected navigation, the layout and the possible improvements that could be realised. Students evaluate the work of their classmates and we take the average of their scores. Final scores are obtaining 50% from students scores and 50% from teacher scores.

General aspects consider in the evaluation of the websites are: use of tools, layout, accessibility, contents and presentation quality.

*Theoretical part*: written exam about the concepts presented in the course. The value of this part represents the 30%. The exam usually consists of short questions in which it is possible to be verified that the student knows the used elements in the Web and basic concepts.
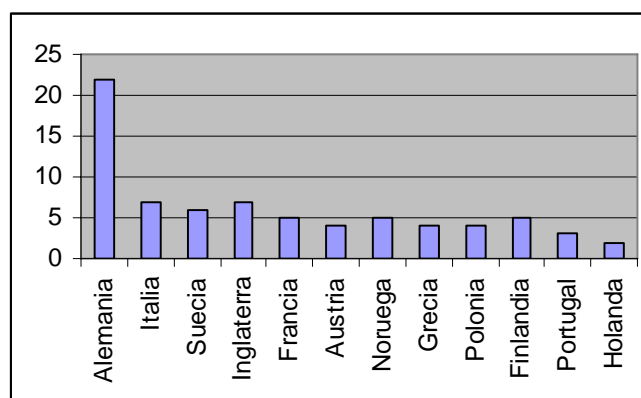


Figure 2. Internet Programming Course students countries.

## 4.4. Results

The results obtained by means of the application of the participating approach are very positive. The students create websites with good quality. Most of them turn on general subjects of the European reality and some of them present their own experience in our country. For some local students, they express that the opportunity of to have known the habits of foreign students without travel out of Spain is very fruitful. 90% of students pass the subject. Origin of the students is very varied and can be check it in figure 2. Participation of multicultural groups is higher in comparison with Spanish students groups.

## 5. Conclusions

In this paper it has been presented different experiences of mobility related to the studies of Computer science at the UA. Mobility has been presented from different points of view: teacher exchanges, coordination of student mobility, even teaching subjects to students of different countries and studies. All these experiences have been highly beneficial as much in the educational part as in the research aspects. We can corroborate that the educational exchange of students has a high benefit that comes from the exchange of experiences and the learning of other ways to view education and research.

## Acknowledgements

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