

International Education

UMANE Atlantis Program

EU/US International Bachelor's Degree

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Abstract—In order to show and promote the value of international education, two Spanish students relate their experiences in a combined bachelor's degree program called UMANE Atlantis and the benefits gained from their international studies. UMANE Atlantis starts in Spain, then moves to Italy and ends in the USA.

Keywords—international education; multi-cultural experience; combined bachelor's degrees; traveling; languages;

I. INTRODUCTION

The global environment of today's industrial, service and business sectors requires graduating students to be prepared to work in cross-cultural settings. Graduating engineers today have to work and to interact in a global environment. Cognizant, of this factor many institutes of higher education offer study-abroad programs. Traveling and studying in different countries includes learning languages, meeting new cultures, understanding new ways of work. Most important, it opens the mind [1].

Since its founding after the First World War in 1919, the Institute of International Education (IIE) has continued to promote academic exchange between the United States and Europe. After World War II, the Institute helped establish what is now NAFSA: Association of International Educators (National Association of Foreign Student Advisers) and CIEE (Council on International Educational Exchange). One of the most renowned programs that began after the Second World War by the US State Department and administered by IIE is the Fulbright Scholar Program — IIE's largest program to date — where dozens of European institutions have joined as members of this successful network of exchange [1] [2].

Nevertheless, after November 2001, while the number of exchange students supported by Erasmus and Erasmus Mundus programs within and into Europe increased, those between the US and Europe decreased [1].

Currently the international programs are growing again, thanks to the interest of the countries to send students to learn other ways to work and also to the interest of the universities to take foreign students in who can bring different ways of thinking.

The UMANE Atlantis program is an international program between the US and Europe (Spain and Italy). The authors of this paper are two Spanish students, Luis Miguel-Mora Gonzalez and Jose Javier-Montaner Mora, who are in this program now. They are attending their last year of the program, the fourth year, at NJIT. This May 2014, they will graduate with a B.S. degree from each of the three universities involved.

The topics that will be addressed include an explanation of and the benefits acquired from this program, the challenges for the institutions, the knowledge obtained from international education, and the personal experience from the point of view of the authors. There are also some interviews with students who have completed the program, and one with the coordinator, Dr. Layek Abdel-Malek, at NJIT.

II. UMANE ATLANTIS PROGRAM

The project UMANE, EU/US International Bachelor's Degree in Engineering **MANagEment** is comprised of several universities and majors: a BS in Industrial Engineering at the New Jersey Institute of Technology, a BS in Mechanical Engineering at the Universitat Politècnica de València (Spain), a specific BS in Industrial Organization at the Universidad de Extremadura (Spain), and a BS in Management Engineering at the Univeristà degli Studi di Parma (Italy). Rutgers University is also involved but does not include its own degree into the program.

Two or three students from each of these universities are selected each year to attend the program. Students have to complete their studies in the three countries, starting in their original country.

It is difficult for the students to earn three bachelor's degrees in four years. Although there is an overlap in many of the courses in the three majors since all of them lead to engineering degrees, many of the specific courses for each degree have to be covered, so the students take extra credits during the program. The incentive is, of course, that one can graduate with a degree from all three countries at the same time.

The computation of academic credits is different among the different countries and programs. The goal is to coordinate an academically balanced program, including the length of the courses offered by the different universities and the workload in all the programs. For that reason, the number of credits has to be converted from the US program to the EU program and vice versa. For the equivalence there are some patterns to follow:

- In Italy, undergraduate studies are 180 credits during 3 years, 60 per year. Students have to complete 30 European Credit Transfer System (ECTS) credits during one semester to achieve the degree. ECTS credits in Europe correspond with 24 hours of a student's work; one-third of these hours (8 hours) are covered by lessons.
- In Spain, one ECTS credit corresponds with 25 hours. Undergraduate studies are 4 years, for a total of 240 ECTS credits, 60 per year. Students have to cover a minimum of 30 ECTS credits in Spain during one semester to achieve the degree.
- In the US, a conventional year is approximately 30 credits. A course of one credit corresponds to one hour/week of lessons for about 15 weeks. Hence, approximately 1 credit in the US corresponds to 15 hours of a student's work.

Thus the equivalence between the US credits and the European credits is

$$3 \text{ US credits} = 5.625 \text{ ECTS [1].}$$

Nevertheless, the circumstances define each situation and for all cases in academic recognitions, each student is studied independently by the advisors at each institution.

Additionally, the grades are also different among the different universities. In the US grades are specified using letters (A, B⁺, B ...). In Italy grades are a total of 30 points, and the minimum grade required for passing is 18 points. In addition, attendance is not required to pass the classes. That is different from the policy in Spain and the US. In Spain, grades are a maximum of 10 points and attendance is required in both theoretical and practical classes. There are tables to transfer the grades among the universities.

UMANE Atlantis is joined to the EU/US departments of education, which provides a scholarship to each of the students during the time that they are studying abroad. This support consists of an economic grant of 12,000€, and an Erasmus grant while students from Europe are in their continent. The tuition at the original university covers the tuition at the other two universities.

III. UMANE BENEFITS

The UMANE program affords the student many different skills. Traveling around the world in different countries (Spain, Italy and the US) and on different continents (Europe and America) provides a great experience for the students. There are also other positive aspects like the possibility to travel around Europe and America, and to learn about the cuisine and history of these countries.

Due to the complexity of the coordination of the program in three different universities and different academic systems in Europe and the US, UMANE selects students committed to the program, students with the capacity to improve and develop new skills continuously, to adapt themselves to new challenges. This program, conscious of all these new challenges for the students, helps them to organize their programs with the advice of the coordinators. UMANE's program flexibility allows students the opportunity to develop their potential in many different ways.

UMANE is the previous step before an international working methodology. However this program is not just focused on academic training. UMANE provides the student the option to do a senior project with a company while attending some of the universities involved. It also provides the possibility to start to work with different companies around the world, developing projects for these companies or just working with them getting international experience and development.

In conclusion, UMANE sets the foundation for international academic and professional training at the highest levels, increasing networks, experience, knowledge and ability to develop one's working life in a globalized environment. Since two of the member countries are in a difficult economic situation, UMANE gives the students a good point of view of multiple aspects of the market. The US, although it currently has a relatively high unemployment rate, generates more job offers in the engineering fields than do Spain or Italy. This program opens the doors to the possibility of finding a job in the big companies where nearly every student has dreamt of working.

IV. CHALLENGES FOR THE INSTITUTIONS

The project UMANE, as many other international programs, faces numerous challenges, logistical and academic. The following are some highlighted but also common examples:

- All the institutions and parts involved in the program have to communicate effectively with the other institutions. Due to the different languages, misunderstandings can happen.
- When the award is received, the administration pays closer attention to what was agreed upon in the proposal which could raise concerns among the members of the consortium, particularly regarding accreditation issues and each institute's transfer credit requirements.

- Flexibility of the institutions is necessary, particularly recognizing the equivalence among courses from other universities.
- Computation of the academic credits is different among the different universities. That means flexibility is also necessary in this field.
- On-line registration is also a challenge. The informatics systems cannot recognize the foreign students until they are at the corresponding university. The on-line course registration is also a challenge because most courses require as pre-requisites other classes from freshman and junior courses that foreign students have not taken. Additionally, courses may not be offered in the particular semester when students need them.
- The US and European educational systems are different. There are different ways to evaluate the student's performance. For example in the US, students have to do homework, take quizzes, write term papers, and take final examinations. In Italy there may be only one examination. In Spain there are projects, labs during the semester, and a final exam [1].

In order to deal with all these factors, flexibility is required by all participants.

V. KNOWLEDGE ACQUIRED

Through the different experiences and travels around the world, the student is provided with specific skills in important fields such as the two new languages (English and Italian – for the writers), the ability to improve him or herself, and the ability to think laterally. In addition, the student becomes creative, inquisitive, analytical, and detail-oriented.

Learning in different prestigious universities allows the student to work with teaching professionals and people involved in improving their personal and academic development. Studying their vocation from several points of view and work styles, and learning new ways to solve problems helps to develop their passion for engineering.

In addition, UMANE represents the path to discover new worlds of opportunities. The students can challenge themselves continuously. The students develop independence, building their own future, starting from international training. This program becomes a stimulating way for those who want take a qualitative leap in their training.

Definitely, this study program demands maximum effort and dedication by the student. He or she will develop knowledge in different branches of engineering such as Industrial, Management and Mechanical Engineering, with the opportunity to develop various projects and to work with several companies in both countries. The program provides skills and technical background in all these fields.

Nevertheless, beyond the technical knowledge acquired in specific areas of engineering, there is other necessary knowledge as important as the technical for engineers.

Communication is another important field where the student develops skills. Communication abilities are becoming increasingly important as engineers frequently interact with specialists in a wide range of fields outside engineering.

Acquiring good problem-solving skills and the capacity to solve problems rapidly and effectively helps the students take part in continuing their education and keeping abreast of new research and ideas.

Another aspect of this education emphasizes being creative and searching for new and innovative ways to develop systems and make existing things work more efficiently.

One becomes a team player, part of a larger team, by working together with people from different countries.

Finally, other skills are acquired due to the different environments where the student develops knowledge of different countries, the capacity to be self-sufficient, and the development of ability and essential skills in management and leadership.

VI. PERSONAL EXPERIENCE

The authors of this paper have encountered some curious aspects during their attendance at this program.

They have to adapt to new cultures and lifestyles. Schedules change in each of the countries involved, not only the time to have lunch, but also the time to work. Although lunchtime is very similar between Italy and the US, Spanish schedules seem to take more advantage of all hours of a day. In Italy and also in the US the stores close earlier. In Valencia the Spanish students were used to taking courses only during the mornings and afternoons several days a week but with shorter classes. But the universities of Parma and New Jersey were very different at least in the courses that these students take, and it necessitated a complete change in their method of study [3].

After these Spanish students faced the Italian education and are currently facing the American education in NJIT, they can say that coming from UPV they have been trained enough not to have big problems attending the other universities. Currently education is strong in the UPV (Spain). Of course, these students needed extra effort to learn the languages of Italian and English because the classes in each country are taught in their own language.

In the course of the program, the men started their studies in Mechanical Engineering, then they switched to Engineering Management in Italy. The last change was to Industrial Engineering in the US. They have had to complete the three different academic programs. In order to cover all the programs, they took 46 ECTS credits in Italy during one semester and 39 US credits in one year at NJIT. This effort was necessary to complete all the degrees in their specific cases and be able to graduate, completing 271 ECTS credits (145 US credits) as undergraduate students. These sometimes onerous requirements created a capacity of adaptation, commitment and flexibility, on the part of students and institutions to successfully complete this program.

The education system of each country is different, and universities within countries differ also. What the Spanish students found in the courses that they have taken so far is that in Parma, their courses had no homework or projects and only one final exam that sometimes was half oral. On the other hand in New Jersey, the students found continuous homework each week from the first day of class, projects for almost every course, midterm and final exams. Valencia's requirements are the same as in New Jersey, but there is no homework unless the student chooses to do proposals to better prepare for the exams.

Organizing the courses needed to complete the three degrees in the three universities is really hard because each university updates its courses and schedules almost every year. It is almost impossible to prepare a schedule of the courses to take before starting the program. The coordinator of each university gives the students a plan with the core courses required to get the degree from that university, but in the end, each student has to know the courses that he has taken so far from different universities. So the student, of course with the help of the coordinator, has to find and fix the courses required and build a schedule, which is one of the hardest things to do. It makes the students more self-sufficient in taking decisions over their lives, teaches them how to search courses on a completely new website for each university, and how to fix their schedules.

One disadvantage is that many of the full-time jobs that these students are seeking do not sponsor foreign students for visas.

VII. INTERVIEWS

Carlos Cocoví Higuera from the Universitat Politècnica de València, and Richard Lou from Rutgers University are students who have already completed the UMANE program. They agreed to share their experiences about the benefits of this program. They represent the effort and ability to search and build their own future.

They share their impressions of the UMANE. Their answers and situations show, better than anything, the importance of this international program. Both are now working in the US in different fields. C. Cocoví Higuera works as a Supply Chain Analyst in a well-known German appliance company. R. Lou, an American student, works for a company in New York City but travels around the US due to his responsibilities in his company. They are two different examples, one from Europe and another from the US. But both highlight the importance of this program in their lives.

On the one hand, C. Cocoví Higuera stresses the different knowledge acquired, the new capacities and the gained competitiveness in the actual scope of work. In addition, he adds the importance of multicultural development and personal experiences.

“The UMANE program was the qualitative leap to stand out as an engineer. At the beginning it was a challenge, but I have learnt to develop the skills needed to achieve my goals. This program provided me the capacity to build a new future perspective in my career. I gained relevant skills and

experience to highlight in an international engineering environment. It was arduous, but really gratifying.”

Additionally, R. Lou highlights the experiences lived and the importance beyond the study program.

“Of course UMANE is one of the most important international programs and provides the basis of a global training to become a worker with the necessary skills to develop your work. But this is much more than a study program. You have the capacity to develop your network and personal skills. The program stimulates and challenges you. The most important part is growing as a person. Finally, I think when you are an adult citizen you have time only to work. Now is the time to live the best experience of your life.”

Dr. Layek Abdel-Malek gave his point of view as the coordinator of UMANE Atlantis and professor at NJIT.

He mentioned that the UMANE program has a positive impact on the classroom environment. He has found specific improvement in the two courses that he teaches: an undergraduate Operational Research, which is a face-to-face course, and the senior project in Industrial Engineering.

In the first course there was friendly competition in the class between NJIT students and the Europeans. He mentioned that the average on the midterms increased about 15% from previous years.

Regarding the senior project, most of the groups consisted of both European and US students, allowing more cultural interaction and various outlooks, including how to handle specific projects. For example, during this year's project with L'Oreal Company, one of the groups consisted of two Italian students and three American students. The objective was to increase the efficiency of one of the company's production lines while adhering to NIOSH (National Institute for Occupational Safety and Health) standards. One of the problems was, in order to cut the lipstick bulk, the operator had to execute excessive force, which nearly exceeded the allowed load level for this process.

The students from Parma (Italy) suggested a very simple solution: to use a simple gadget that is used in cutting cheese in the companies in Italy. The company adopted the gadget.

Professor Malek concluded by saying that “the presence of students from multi-cultural backgrounds in the same classroom has led to introducing a more global approach in presenting the material, appealing to a wider range and a cosmopolitan audience.”

VIII. CONCLUSIONS

The importance of these international programs is remarkable. They provide enriching experiences and skills to develop oneself in work and life. They provide new social and technical capacities that represent a significant advancement in one's formation and training. One outstanding international program is UMANE, which connects Europe and the US, providing the opportunity to live personal, unique and rewarding experiences in order to improve and grow as a person.

It is difficult to decide which education system among the three countries is the best. It is true that the education in the US always tries to be more practical and close to real work while European education involves more theory, and sometimes the students learn more concepts. Maybe this conclusion comes from the fact the students attend the complete fourth year (the last year) of the degree in the US, which means that in all universities, the courses in the final year are focused on preparing for work. However the experience of studying and working with students from many different countries demonstrates that, if one is consistent in his/her studies and works hard, he or she will be a good student in any country.

One problem is that there is a great deal of red tape involved in the applications to the universities and for the visas. It may take months to get the requests approved. Even the different time zones have caused difficulties, especially at the beginning of the courses when it was necessary to keep in contact with the coordinator of each university to build the learning agreement based on the courses running in each period. The learning agreement for the courses should be clearer from the beginning, for the peace of mind of the students as they arrive at a new university.

The authors believe, however, if one wants to become a good specialist in one field, and if he or she does not want to work abroad, the best choice is definitely to continue studies in one university.

On the other hand, if students want to open their minds, learn how to adapt to different methods of education, expand their knowledge in multiple fields with multiple degrees, learn new languages, learn new ways to face life, and learn how to work and live inside a multicultural atmosphere, which nowadays is increasing inside the big companies, without a doubt, they should take an international program such as UMANE Atlantis or a similar one.

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