International Cooperation in Engineering Education: The Support to Students in ESTG/IPPortalegre and CoE/UMichigan

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Abstract *— We present a case of international cooperation in Engineering Education that is based in complementary approaches in the field of support to students. The main challenges that are faced in the College of Technology and Management at the Portalegre Polytechnics Institute (ESTG/IPPortalegre) are similar to those arising in the College of Engineering at The University of Michigan (CoE/UMichigan), for instance, the enrolment and retention of freshmen, the personnel development of undergraduates, the employment rate of ours graduates, the collaboration with industry, and the research environment. Nevertheless, the cultural subjects and the geographical location, the size and nature of the two institutions are quite different too, and they are applying different approaches to support students in their academic achievements. The main purpose of the grant #3045 of the Fulbright Senior Specialist program was to develop student's support approaches that are smoothing the differences that actually exist, by combining the well known expertise of the US institution in the tutorial field with the Portuguese extensive experience in basic sciences area. The program promoted the participation of the US expert in a specific academic issue, the student ´s lack of competences on Mathematics basics, and it resulted on transference of knowledge and expertise to the Portuguese college, in the sense to improve learning methodologies, to promote the autonomy and to empower the students, in a Bologna framework that is in the first stage of being implemented at ESTG/IPPortalegre.*

Index Terms *— Engineering Education; International Cooperation; Support to Students; Bologna Process.*

1. INTRODUCTION

At Portuguese institutions, undergraduate programs are being restructured to comply with the Bologna Process regulations. This new structure of programs has enhanced the lack of competences that many students have in the basic sciences, such as Mathematics, especially those students who did not have Mathematics courses during secondary studies. Furthermore, Bologna principles demand that students are given mentoring and tutoring support from faculty, which requires that some training is provided as these were not common activities in Portuguese high education institutions before Bologna.
Therefore it has been recognized that there is a need to develop procedures and tools that will enable students to acquire the skills they presently lack as well as to improve learning methodologies and to promote students' autonomy. To achieve this goal the Portalegre Polytechnics Institute (IPPortalegre) realized what is needed is to first focus on the training of faculty.
However, some difficulties were well known in the field of support to students, such as different paradigms arising in several Colleges of IPPortalegre, or even the overload of efforts that are required of the teaching staff. This has created a need to review the good practices of other high education institutions (HEI), and to gain a broader knowledge of the strategies and tools they are using. Naturally, as the Bologna process was ongoing and the procedures it suggested were not fully developed in European level, the focus was directed to US institutions and their cooperation programs.
Fortunately for this, we received help from the Fulbright Senior Specialists Program in the form of the grant #3045 with support for the following activities:

1. Assessment of needs and resources, and outline of a work program;
2. Workshops and a training program for faculty on mentorship, tutorship, tutorial development and behavioral assessment.
3. Development of a student's support program;
4. Assessment of the project's results through quantitative indicators to be defined with the Senior Specialist's cooperation.

The paper considers: in Sec. 2, a brief review of the main issues concerning international cooperation and Engineering Education; in Sec.3, the description of the program #3045 of the Fulbright Senior Specialist developed at IPP; in Sec.4,

the presentation of the Support to Students workshop, which represents the most significant event of the program; in Sec.5, other interesting subjects of this international cooperation's case; finally, the main conclusions.

2. INTERNATIONAL COOPERATION AND ENGINEERING EDUCATION

For promoting student learning and performance, ``Support to students" is a basic element that has become a very sensitive issue both at local and international levels due to difficulties arising in implementing the Bologna process at the IPP. This issue has been discussed on several occasions at IPP during the academic years 2006-2008. From these discussions, the following conclusions have been reached:

- Different models and strategies of tutoring and support to students are being tried in different Colleges of IPPortalegre, sometimes even in the same College;
- Teaching staff have to devote a lot of time, and hence there is an immediate need to find better strategies to promote learning;
- The mentoring and counseiling activities are important and significant;
- The personnel development can be addressed as a specific tool to leverage the professional learnings;
- ``Support to students" should be normalized and systematized, and embedded into the Bologna framework.

The International Conference in Engineering Education at the University of Pecs, and at the University of Budapest (Hungary, July 2008), also ICEE08 provided wealthy experiences on good practices in Engineering Education.
On the framework of international research collaboration, Kao *et.al.* [1] show the academic achievements and the lessons learned in research and Engineering Education from the collaboration between the State University of New York at Stony Brook (SUNY, NY, USA) and Taiwan's Industrial Technology Research Institute (ITRI). Beyond the closer research interaction between these two HEI, the mutual exchange of culture and ideas was also relevant. Namely, to gain attributes that promoted scholarship and creativity, created a better understanding of the researcher role and promoted critical advances, and enhanced Engineering Education on a global environment for employment opportunities and interactions.
In the quality management framework, Riley *et.al.* [2] describe an initiative that occurred in the School of Engineering at the University of Western Sidney (UWS), Australia, when they were confronted with high rates of loss of students in the first year of Engineering programs. Then, a study was conducted for improving the retention rate, using suitable trends and strategies to reduce the attrition rates, and examining the causes of attrition, and the preparedness of students incoming in UWS. A Variety of strategies were applied to overcome this issue. Of particular relevance were the level of engagement of faculty staff with the students, careful counseling and student support, good teaching, appropriate assessment, clearing goals and standards. These resulted on improving the overall satisfaction rates from students.
In the first year of Engineering programs at UWS, Bishop *et.al.* [3] had identified some of the key factors (school environment, peer pressure, ability, career aspirations, student views of universities, family, and finance) involved in the student's decision to select Engineering studies, and a model was used to describe the enrolment and retention process. The main target was to better prepare the transition of student from high school to university and some notes based on the own experience of the UWS teaching staff are described.
However, the enrolment and retention issues are not restricted to one region or area, neither to one specific kind of students. For instance, in an International Conference on Engineering and Business Education, Nagy *et.al.* [4] had described some computational and innovative techniques with the aim of supporting different types of students or trainees: medium or highly qualified employed personal; managers; those looking for new job; those looking to learn how to use specific software; and the students at HEI of different Engineering or Economics specialties. Those computational techniques were built to support the students that are attending the Master Science program in Management and Business Administration.
After looking at these publications in the literature, to develop its ``Support to student's program" IPPortalegre has decided to integrate the expertize of the CoE/UMichigan in related fields, with the current experience of teaching staff at ESTG/IPPortelagre in the basic sciences areas. IPPortalegre's proposal to the Fulbright program had the focus on ``Support to students", improving mathematics basics, learning methodologies, the promotion of student's self-learning, and embedding this into the Bologna paradigm.
We found the required attributes of the person to help us in this effort in Professor Katta Murty, who was in the Fulbright Senior Specialists Program at that time. Katta Murty is a full-time Professor in the Operations Research field, he is teaching for more than 40 years in the CoE/UMichigan, mainly focusing on courses of Linear, Integer, and Nonlinear Programming, Combinatorial Optimization, Network modeling, and he is author of large number of papers in the referred Optimization subjects. His research interests rely in efficient algorithms for optimization problems and their applications and he is also interested in international cooperation proposals.

Objectives of the ESTG/IPPortalegre and CoE/UMichigan cooperation

Thus, the main purpose of collaboration with Professor Katta Murty was to complement the already noticed subjects in the Colleges of IPPortalegre in the 2006-08 years by proposing good practices, and which were well known by the peers

in US, and by the results achieved by them. The concrete objectives are:

- Considering the recent evolution of several colleges at IPP, to bring them into a uniform and coherent frame, and to better develop communications with each other;
- Availability of contents by electronic via (web-books, web-tutorials), promotion of e-learning, being at real time in the classroom or offline and at large distance;
- Provide encouragement for senior students to support freshmen (1st year students, “caloiros”), being the support of specific or general kind;
- Sensitization for honor code of conduct.

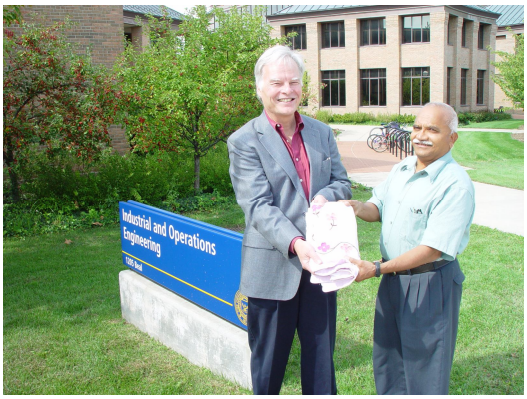

FIGURE 1
PHOTO OF KATTA MURTY AND THE COE CHAIR LARRY SEIFORD WITH THE DANTZIG TOWEl

Finally in order to improve the existing programs in the broad area of ``Support to students", the decision was taken to conduct a workshop discussing good practices in this respect for faculty from various colleges

3. THE FULBRIGHT SENIOR SPECIALIST PROGRAM (GRANT #3045)

In this Section, we briefly describe the Fulbright Senior Specialist program directed to Support the Students in IPPortalegre, the motivations and purposes, the planned activities, and the targeted audiences (considering both the short and large terms).

Program description

The IPPortalegre is a Portuguese higher education institution (HEI) responsible for teaching, training, research and other activities in their respective scientific, pedagogic, technical and artistic scope. It is attended by about 3,000 students. It offers twenty-two initial training courses in four autonomous colleges, namely the College of Technology and Management (ESTG), which is the home institution of the proposal: it represents around 1,600 students, distributed by ten training courses on Design, Engineering, Human Science and Management Science specialties.
At present, European HEI are under pressure due to Bologna Process, to the public need of lifelong learning, but also to the lack of competences on basic sciences, like Mathematics, Physics, or Chemistry These issues have made it essential to coordinate teacher's efforts and to integrate the pedagogical methodologies used, in order to improve student learning of basic sciences.
The described difficulties are well recognized, several Portuguese HEI are developing serious and extensive efforts in the field, such as elaborating specific web-tutorials or improving psychological support to underperforming students. Nevertheless, this kind of efforts needs the commitment of the faculty, and they have to feel secure and comfortable in the required type of activities, that are not usual among Portuguese colleges.
The goal is to develop procedures and tools to support students efforts, which will diminish the differences in level and contents that actually exist in ours students. But to achieve this goal, we need to first focus on the specific training of teachers as a pre-target group.
To realize the targeted support (e.g., by tutor, mentor, tutorial developments) it is required to further tune the approach in concordance with the Bologna Process (ECTS and Diploma Supplement). The development and assessment of the student’s support is targeted for students in ESTG, but also available for students belonging to others colleges of IPPortalegre. Since each college has specific needs, a common procedure can be established to the extent feasible. This subject is the core of the project, since it is specifically aimed to support the autonomous learning of the students. It includes a short faculty training program on mentoring, tutorship, tutorial development and behavioral assessment.

The Student's support procedures developed will then be implemented, first with a pre-target group of teachers (from 30 to 100) of the home institution. Based on the student's support program, available documentation suggested by the Senior Specialist is adapted specifically for the referred pre-target, preferably in digital mode, and a workshop that includes training actions for teachers is designed and implemented. The faculty language, beyond the allowed native Portuguese language, is preferably English as working language.
Finally, the dissemination of the procedures that focused student's support, by implementation of the learning procedures and strategies, aimed the students (from 400 to 800) inside the home institution as targeted audience, or further more, students from other colleges of IPPortalegre. Based on the student's support program, available documentation is adapted specifically for the referred target. We allow paper as communication support, but we preferably select digital support for economic reasons.

FIGURE 2
VIEW AT THE ESTG/IPPORTALEGRE BUILDING

According to the expertise and research skills of the faculty staff, ESTG provided and supported the project in close cooperation with the incoming Senior Specialist, Katta Murty.

Program purpose

The main purpose was to develop student's support approaches, that are smoothing the differences in level and contents that actually exist, by combining the well known expertise of the US institutions in the tutorial field with Portuguese extensive experience in basic sciences area. Notwithstanding, it was recognized that there are several difficulties in Portuguese approaches onto student's support.
This is a significant issue: to allow transference of successful procedures from US institutions to IPPortalegre, in a field that Portuguese high education institutions have not fully developed. The project fostered the increased participation of US academic and educational institutions in a specific academic issue, the student ´s lack of competences on Mathematics basics, and it results on transfer of knowledge and expertise to a Portuguese college that is committed to apply it, in the sense of strengthening education success It is thus proposed to improve learning methodologies, promoting the autonomy and the empowering of the students. To realize the student's support they are defined several partial objectives to accomplish: first, to further tune the curricula in concordance with the Bologna Process (ECTS and Diploma Supplement); then, to set up a structure and build the support procedures; and to assess the quality of the developed activities.
Several pedagogical difficulties are addressed, through student's autonomy empowerment and students learn by them-self, and this promoting the study of basic sciences. For instance, the worker-students can use their time with more flexibility, and this is a significant improvement in the Portuguese academic environment.
Another issue occurs when students of social sciences are facing quantitative questions or problems, whose resolution requires Mathematics basics. Actually, this causes a situation unreachable in several of Portuguese training courses, since this kind of students did not have Mathematics classes on secondary level.
Thus, the project's aim was to set up a framework based on adequate actual and existing documentation, which include texts, examples and applications, and allow student self-assessment through exercises and problems. Thus, it was mandatory to share experiences between higher education institutions promoting student's support approaches, with relevance on curricula development, teaching and training of the described types of students.
The scheduling of activities considered:

- an initial assessment of needs and resources, to meet and consult pedagogic and scientific organs of the home institution, onto develop a student's support program (2 weeks); obviously, due to the time horizon, we could only give a synoptic treatment of the issue, followed by the application of a well defined and stated program of activities;

- it follows the exploitation by home institution faculty to complement competences on the field, through a workshop and training actions (1 week); it is focused the student's support in several approaches, namely, mentorship, tutorship, development of specific tutorials, and students behavioral assessment;
- and finally, the assessment of the developed activities, through the real proof in face of dissemination of the program onto students (1 week); they are targeted field tests, to evaluate the improvement of faculty competences, that can serve as measure of performance and to promote further developments.

They are used information and communication technologies (ICT) as tools to catalyze the requirement of lifelong learning, and this way it can be performed in an accurate and effective framework, supported in the large experience presented by the IPPortalegre faculty in the basic sciences field. This promoted knowledge and competences on technological issues, and they are not forgot the language skills, within an adequate use of scientific terminology. Further, the empowerment of student's autonomy turns itself on a successful subject to fully develop.
Consequently, the main objective of this project was to increase faculty training in the targeted field, the student's support and related methodologies, which can strongly enhance the long term target, i.e., the success of students which are revealing difficulties in basic competences.

Audience

The developed tools are directed for the students of ESTG as the home institution, but they are also available for external students from other colleges of IPPortalegre. To achieve this kind of impact, an effort is planned in the communication field. The target group was first cycle Bologna students, namely, students revealing discontinuities on basic sciences:

- Engineering or Management students (from 200 to 400), revealing lack of basic competences; this corresponds to native language difficulties, scientific terminology not achieved, erroneous problem approaches, calculus and quantitative mistakes, absence of reasoning within several steps;
- Working students (from 100 to 200), returning to studies after a long time of practical work; this occurs on several unemployment situations, or even on graduation level compulsory to career evolution, but it is usually observed that the quality of formal competences do not follow the corresponding method study and organizational capacities;
- Students of Management or Social Science areas (from 100 to 200), who need to apply some Mathematics tools, but they had not secondary level classes on this discipline; this is a significant issue, namely when the student resorts to simple calculus, statistic or algebraic rules, and they can not find the correct approach.

Considering only the pre-target group, they are considered groups of teachers, from Mathematics to other basic sciences (Physics, Informatics, Chemistry...), to groups of Management specialties (Accounting, Management, Marketing...), or even others. The number of teachers directly involved on the project was almost 30. However, it is realistically forecasted that around 100 teachers can be reached during the four weeks that constitute the project lifetime.
The training actions are focusing this pre-target group, and the following field tests can assess the competences achieved, in the mentorship or tutorship approaches, in the tutorials development framework, or in the assessment of student's behavior. This way, the competences of the pre-target group on student's support constituted the main purpose of the project, and it is considered also the restricted time horizon of the project. The Group of Mathematics on the Engineering scientific area was directly engaged on the project, and this group is constituted by four dedicated teachers, i.e., on exclusive teaching time.
Further, quantitative indicators for assessment of the project's impact are established in due time, in a common basis with the Senior Specialist.

4. THE SUPPORT TO STUDENTS' WORKSHOP

The Support to Students' Workshop is the main target of the project, and it occurred in two different days, considering technical sessions and an ending plenary session. The workshop's program is presented in Figure 3, and each of the sessions (documentation [5]-[8] available in http://www.global.estgp.pt/docente/jlmiran/senior3045/) is briefly described in this Section 4.

The Education System at UMichigan and
the Comparison of Education Systems at IPPortalegre and UMichigan

As starting point of the workshop, we decided to provide some basic information about the focused subjects [5]-[6]. This way, the interactivity and the discussion could naturally flows. They are characterized both the HEI, CoE/UMichigan and IPPortalegre, qualitatively and in dimension (e.g., human resources and number of students, number of Colleges, Departments, and programs), their structure and its composing organs are described, some paradigm and concepts are clarified (credit-hours, assessment, workload of students and faculty), financial issues are explained, terminology is compared, among other minor subjects that we paid attention.

Student Discipline

- **Honor Code at UMichigan** — The guiding principles are presented by Katta Murty [5], the first week of classes is explained as departing moment of communication, and procedures for not proctored exams are analysed; Honor Code principle applies also to homework, lab, project assignments, and procedures onto investigating violations are also treated.
- **Adopting to local conditions** — Eduardo Ribeiro and Francisco Vidinha (ESS/IPPortalegre, *Health College*) presented a training model [7] that are fully applied at the Personnel Development course, which are based on transversal learnings, focused on nursery competences, and described the tutor roles; then, they balanced and discussed the construction of learnings using a text elaborated [7] using their own professional experience.

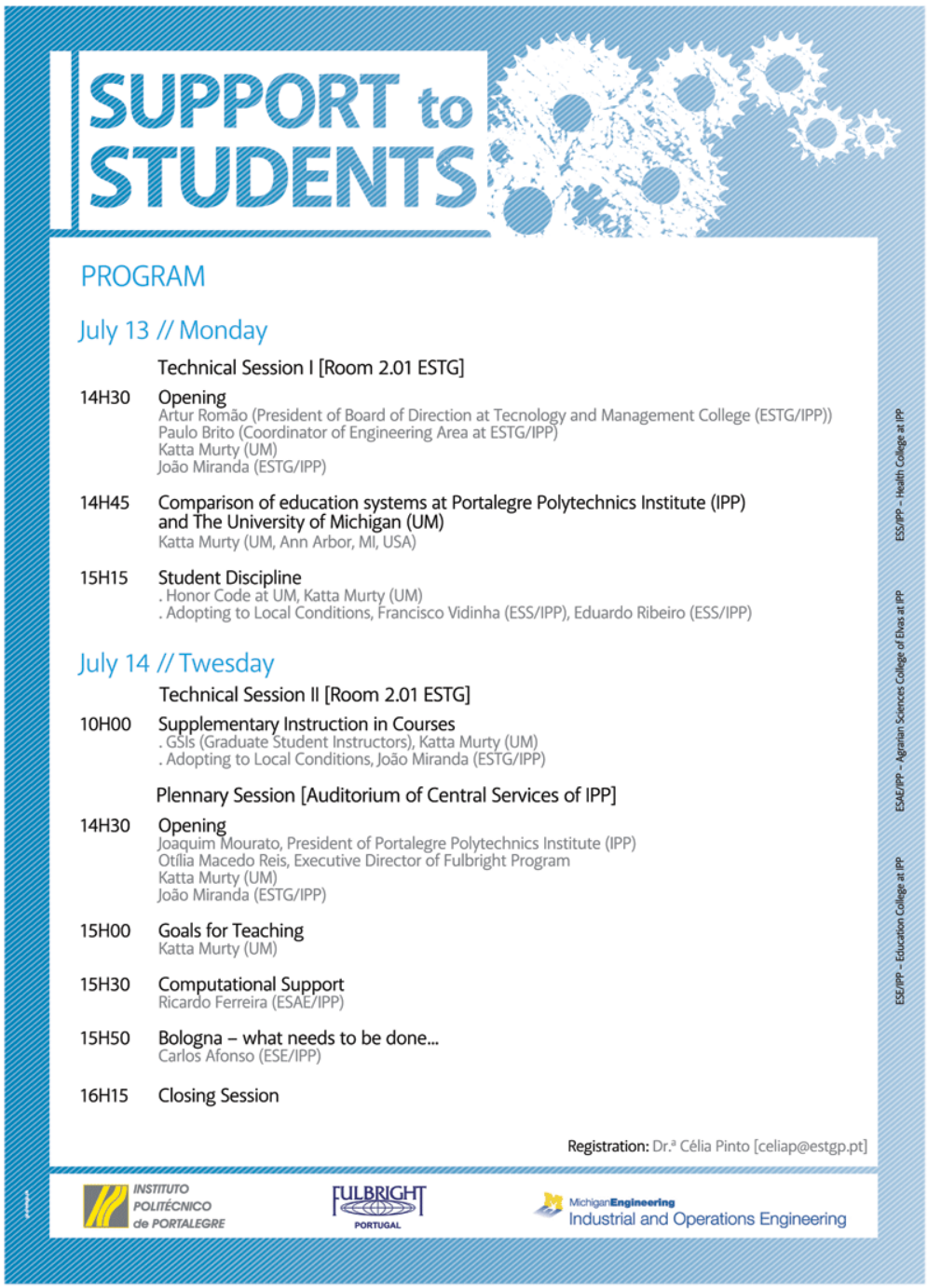

FIGURE 3
POSTER OF THE SUPPORT TO STUDENTS' WORKSHOP

Supplementary instruction in courses

- **Graduate Student Instructors (GSI) at UMichigan** — The necessity of Suplementary Instruction (SI) in courses is explained by Katta Murty [5], as well as the utilization of GSI in courses with sufficient enrollment; The promotion of teamwork, the voluntary attendance onto SI sessions and drop-and-by office hours, SI for entering students (1st year), and the utilization of homework Graders is also focused.
- **Adopting to local conditions** — João Miranda [6] addressed the enrolment and the retention of the first year students, he decribed some efforts both on mentoring and tutoring developed in the different Colleges of IPPortalegre, he focused communication issues [2]-[3], and a general framework is outlined [9]; finally, pratical demonstrations of team work [10] and Honor Code are performed.

Plenary Session

- **Goals for teaching** — Katta Murty stated the main goals [5] can be described by the 3D's (Drive, Determination, Desire) and to challenge and support students in their learning, not only to develop their knowledge and skills by academic purposes, but the importance of learning for a lifetime; once again, the importance of the first week of classes and the detailed explanation of program contents is reinforced; the computer support for instruction, using applications developed at UMichigan named C-tools (https://ctools.umich.edu/portal), also is addressed.
- **The computational support** — Ricardo Ferreira (ESAE/IPPortalegre, Agrarian Sciences College of Elvas) developed a brief analysis of the current computational structures, equipments, and learning management systems on the different Colleges of IPPortalegre; then, he finished with an exciting presentation of his own courses in the Moodle platform.
- **Bologna-What needs to be done…**— Carlos Afonso (ESE/ IPPortalegre, *Education College*) presented a synopsis of the achievements done in the Bologna framework [8], and paid attention to several subjects that are deserving further efforts, such as terminology and its utilization, the learning outcomes, the overview of competence paradigma, and what needs to be done in tutoring and other necessary changes.

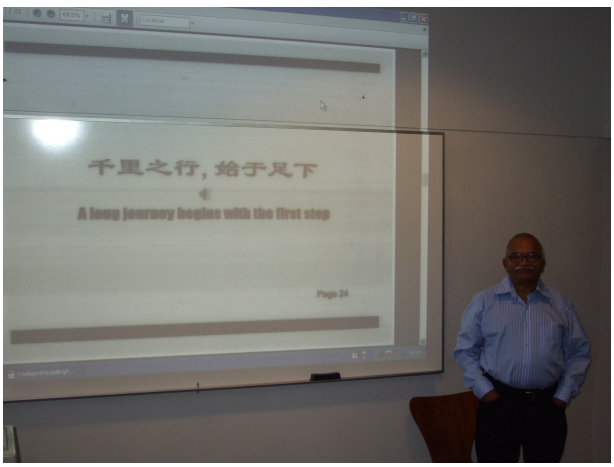

FIGURE 4
PHOTO TAKEN AT THE TALK ON *INTELLIGENT MODELING*

5. OTHER INTERESTING SUBJECTS OF THE UMICHIGAN/IPPORTALEGRE COOPERATION CASE

In this Section, several subjects of this international cooperation's case can be relevant to the reader, to allow a more detailed image of the set of activities concerning it, being the external evaluation, the cultural interchange, housing, travel and meal arrangements, or even the project impact and potential linkages to both the HEI involved, ESTG/IPPortalegre and CoE/UMichigan.

External Evaluation

In accordance with the project management and the initial work programme, the external evaluation took place at the end of Workshop held in Portalegre [11]. They were taken into consideration as key components of the external evaluation:

1. The coherence between the initial work programme, activities achieved and final outputs.
2. The quality control of final outputs / products, for each work package.

They were recognized strong points and weak points. The strongest ones occurred in the organisation issues that, generally speaking, "demonstrated to be relevant in order to cover the various objectives and challenges raised by the project" [11]. However, there are reported weak points too: at the time, the webpage of the project was in draft phase, due to the tardiness of funding approbation; the number of answers to the internal evaluation was low, do not even achieving half of the number of the participants; some dissemination procedures are planned as follow-up activities, and they require some time to be developed and performed. In despite of some weaknesses, the project presented a large set of positive points as the subjects that follow.

Cultural subjects

In addition to the activities of Fulbright program, several visits and events have helped the Senior Specialist to gain insight and to establish a better appreciation of the complexity of the IPPortalegre and its four Colleges, and also to the specific character of the people, the region and weather. Below, the most important events and visits are referred:

- 20Jun —Arrival at Lisbon; *Innovation Day* (FIL, Lisbon)
- 23Jun — Meeting at ESS/IPPortalegre (*Health College*); Cultural activities;
- 25Jun — Meeting at ESAE/IPPortalegre (*Agrarian College*); Visit to Plants Improvement Center (Elvas); Meeting in the University of Extremadura (Badajoz, Spain)
- 26Jun — Meeting at ESE/IPPortalegre (*Education College*)
- 27&28Jun— Cultural activities
- 01Jul — Meeting at ESS/IPPortalegre
- 02Jul — Talk on *Intelligent Modeling* at ESTG/IPPortalegre
- 03Jul — Dr. Nuno de Oliveira's homage dinner (former President of IPPortalegre)
- 05-08Jul — Euro XXIII (Bonn, Germany)
- 12 Jul — Cultural activities
- 13&14Jul — Workshop on *Support to Students*
- 15Jul — Meeting in the University of Coimbra (Portugal)
- 16Jul — Departure from ESTG/IPP
- 17Jul — Cultural activities
- 18Jul — Departure at Lisbon Airport

FIGURE 5
VIEW AT ELVAS

Housing, In-country travel and meal arrangements

- **Housing** — The IPPortalegre has residence of its own, prepared to receive visiting teachers.

- **In-country travel** — Portuguese travels are reduced, due to the short dimension of the country, or to the distance from the IPPortalegre residences to ESTG building. From Lisbon airport to Portalegre it is needed about 2 hours of travel (about 130 miles), and the IPPortalegre residence is at 5 minutes distance. Usually, ESTG faculty share efforts to escort Colleagues of foreign HEI. As usual, the Senior Specialist is picked-up at the Lisbon airport, and first arrangements and special cares to satisfy (diet, pharmacy issues) are promptly provided.
- **Meal arrangements** — Usually, meals are provided by IPPortalegre canteens that are available for faculty, servants and students, also in weekend. Diet issues can also be assured, in case of medical necessity. However, the period of the program #3045 was delayed from February to July and, in despite of kitchen availability at IPPortalegre residence, specific arrangements needed to be done with two local restaurants.

Project impact on host institution

The project aimed to basic science competences among high education students, including worker-students or students missing secondary level Mathematics classes, and this was a key issue due to the connection onto other basic sciences. Thus, the project linked under-graduation and secondary levels, specially the issue of the in-between transition.
In addition, a tool like the proposed student's support program focused to promote the flexible use of time, to allow the autonomy praised, to improve the access to learning materials and skills growth. Assuming knowledge exchange and sharing experiences, the program aimed to smooth differences on student's curriculum, in conformity with Bologna principles: it was aimed to improve autonomous ways of learning, to catalyze language skills, knowledge and competences on basic sciences

Potential for institutional linkages

The project promoted cooperation that naturally complemented ESTG/IPPortalegre difficulties with the well known expertise of US institutions, in the field of support student efforts. Thus, cooperation between HEI promoting student's support is mandatory to share experiences, with relevance on curricula development, teaching and training.
The ESTG/IPPortalegre and CoE/UMichigan efforts are combined to share expertise and to promote integration of pedagogical methodologies, namely to share experiences among institutions which can suffer the same kind of problems with the same type of students. By its dynamic, the project promoted experience and cultural interchange, it catalyzed innovation and creativity, and it also fostered the mobility of teachers and students, due to autonomy improvement and to learn empowerment.

6. CONCLUSIONS

We presented a case of international cooperation in Engineering Education that has the aim of complementing the existing approaches in the different Colleges of IPPortalegre, within the good practices in the field of support to students from the CoE/UMichigan.
The Fulbright Senior Specialist program promoted the participation of Professor Katta Murty, a US expert in this specific issue of support to students, namely in the basic competences on Mathematics. Considering the Bologna framework, it resulted on knowledge transference to the Portuguese HEI, in the sense to improve learning methodologies, and to promote students autonomy.
The *Support to Students* workshop was aimed to further improved several subjects that were well known as sensitive. Namely, it was addressed:
- The system and procedures at the Coe/UMichigan, and a comparison with the corresponding ones at IPPortalegre was performed;
- The Honor Code, related to conduct and behavior of students, was detailed and its adoption to the local context of IPPortalegre was sensitized;
- Several subjects of Supplementary Instruction were developed, and their adoption to the local context was analized.
- The uniformization and coherence of communication subjects was addressed, the contents electronic dissemination and the e-learning issues are treated, and the Bologna concerns and necessities are also included;
- The external assessment was developed, with general satisfactory results.

Concerning to further developments, from the workshop session, the external assessment, and the internal discussions, it was concluded the necessity of:
- To apply different support to students, developing specific and student-centered activities;
- To develop further communication efforts, in internal and external fields, characterized by coherence and uniformity, and in concordance with Bologna paradigma;
- The electronic promotion of contents, being the learnings occurring at real time or at distance.

- To further systematize and and uniformize the support to students among the different Colleges of IPPortalegre; it must be considered the recent estatutes evolution, the strategic axes and the sustainability plan presently defined.

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