

# Engineering Societies as a vehicle tool for engineering students

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**Abstract**—This paper describes the importance of Engineering Societies inside the educational environment, focusing on the new learning models that appear in the student branches. This model involves pedagogical methods different than the more formal ones used in the classrooms. They are based on more informal approaches where learners are the real center of the process and teachers appear just as tutors or learning drivers, providing the required material and support to learners. The paper describes the successful experience of a Student Branch in a University for Distance Education, overcoming the traditional collaboration and interaction lacks that these kinds of institutions own due to its inner organization and learning methodology.

**Keywords:** *Engineering Societies; Student Branch; blended learning; active learning.*

## I. INTRODUCTION

Engineering societies play an important role inside the university environment, due to they can become a vehicle between university and industry, helping learners to acquire different knowledge than the provided by the formal education. This knowledge could be an important added-value for students when they arrive to work market because they will own more knowledge, experiences and capabilities than the other applicants [1] [2] [3]. These new skills will be the key for their future professional development.

In addition, active participation on these Societies can help learners to improve their self-learning abilities, because they must learn by themselves many technical concepts to put them into practice [4] [5] [6]. They also improve their social skills, such as leadership; organization of projects, talks, workshops, publications, etc; and work scheduling (for themselves and for the group). On the other hand, other advantages are the improvement of their own technical knowledge in the areas where they are interested in (they have access to the latest information about technology), social networking and knowledge about other cultures (with other students or professionals interested in the same areas all over the world).

But in these groups usually learning does not happen spontaneously. Some kind of impulse is required to encourage students to participate in an active way. Usually, it happens through the participation on contests (e.g. robotics,

programming, networks, etc) or through interesting projects to achieve a particular goal. Other incentives for the engagement could be attendance to technical talks, workshops or publication of papers on journals or conferences. Enjoy, learning and success are guaranteed when a student is suitably motivated.

A very good example of the successful implantation of these societies at Universities is the IEEE Student Branch of UNED (Spanish University for Distance Education). This group has overcome the problems of having the members spread all over the country [7]. The paper describes the distributed organization of this group and the use of virtual tools to support the communication and collaboration among group members.

Engineering Societies arise as a very good vehicle to complement the formal education, providing at the same time experience in real projects that will be very useful in the integration within the work market.

## II. POWER AND POTENTIAL OF ENGINEERING SOCIETIES

It is a fact that in order to teach anything, you firstly must know something about it. Engineering Societies had been working in their knowledge field during many years. That is why they are the source of many answers to learn and subsequently to teach. Usually, students only connect with Engineering Societies when they finish their degree. This situation generates an important gap between learnt theory in their degree and real life. The solution would be to keep in touch students and Engineering Societies during academic time. This new approach will give students the possibility to use their recent knowledge gained in their degree, in real life without gapping. This possibility promotes students to pay more attention in their studies. It means that the acquired knowledge will be more useful and enjoyable in their careers and, most important, in their degree years.

In fact, when a student finishes the degree, Engineering Societies will be the link between academic and real life, and will be the new way to continue self-training. The adaptability that Engineering Societies have is a key feature that new degrees should acquire to develop a professional success. In this point, the IEEE-UNED Student Branch thinks that this

feedback after degree must start during academic formation. The IEEE-UNED Student Branch has been working in that line for many years, trying to look for the mechanism to obtain the most of this relationship during academic years.

In our case, we are working with the IEEE (Institute of Electrical and Electronics Engineers) organization. IEEE has several levels for professionals and students to develop before, during and after his/her academic and professional career. We are using the called IEEE Student Branches.

An IEEE Student Branch is an association for students in Technical degrees (Physics, Engineering, Maths, etc...). Its labour reflects clearly how it must articulate the relationship between academic and real life.

In the situation of the UNED, Engineering Societies promote students to develop their own projects. On the other hand, Engineering Societies give them support and advising. The most important part in this relationship is the freedom of students to manage and develop their own objectives. That is the reason why motivation has a special role. The only way to give students responsibilities and maturity in their actions is give them the opportunity to make mistakes and learn from them, at the same time that they solve them. That must be the worker's behaviour in real life.

To train students you must give them skills, but these ones not only must be academic in their area of study, but skills in other areas. These new areas of work may have interest to teach them about management, organization, working in group, collaboration activities, language skills, commercial skills, etc. This Engineering Societies have the possibility to offer those skills to the students because they own as members enterprises; mentors; academic professionals; engineering professionals; public and private employers; business partners; or big and small enterprises. Definitely, they have the most representative roles that students will have to face when finish their degree.

Currently, the IEEE-UNED Student Branch has four important ways to connect Engineering Societies and students:

1. Through Contests. One of the usually ways to motivate, develop and check students' skills is with contests. Most of engineering degrees are related with experimentation and mechanical experiences. This is a good excuse to make a contest. The key is showing the students that academic theory is useful to provide answers to real life. Activities like Robotic Contests, Olympics Maths games, Innovation Contests, and others similar activities work because students learn the practice of their studies and develop competition and cooperative skills. A very good example of this in the IEEE is the IEEE Xtreme programming contest. In this competition, students in all IEEE Students' Branches around the world will compete to show that their students are the best programmers. In this challenge, a team of students will have to solve several problems in 24 hours. It is obvious that a contest like this will teach students a real experience in solving problems with a deadline, work in group, work under pressure, etc. Of course, the winners will get fame and maybe some new opportunities will appear for them to get their dream's job.

2. Through Formation. We can talk about two formation ways:
  - a. Academic Formation: With several activities like technical workshops, language workshops or attendance to technical conferences. It helps to develop academic skills.
  - b. Professional Formation: With Management Workshops, visits to enterprises, financial and marketing workshops. It helps to develop professional and personality skills.
3. Through Labour Market. Put real life in front of students is the most important thing. And real life means to talk about the success, but even more important is to talk about the failure. Students must know enterprises into technical studies and learn about that, visit them and learn their growth process and fall. If students know that real life can be dangerous, they will be more motivated to think about their skills and lack of them that they have. Academic world is a quiet environment for the students, only exams time generates a few of stress in that environment. Usually, they have only one deadline: the day before the exam. Real world is an aggressive environment with daily deadlines, study, work, or family, with more stress and less time to react, usually without second opportunities. The only way to train real life is living it, and the only chance to students to experiment real life is through the important experience of Engineering Societies about it, its advices and by using its skills. Moreover, the societies have experience in project failures, and it is very important to teach students about the mistakes of the past, as it is the best way to avoid having the same mistake over and over again in the future.
4. Personal Issues. It is important to motivate students with Engineering Societies and vice versa. But there is another factor: the personal one, which belongs to other scopes besides the professional one. Engineering Societies help students to work together, helping themselves to study better and so making their work also better. At the IEEE-UNED Student Branch, this is a very important factor. Students have not direct contact with teachers, so they have to study by themselves and help (and be helped) by other colleagues. That is one of the reasons why the personal inter-relationship can be very important and make to grow up these Societies.

Another very important factor for the Engineering Societies is that they give the opportunity of networking. In today's world, there is a lot of competition to get a job. One of the best ways to help students to be successful in obtaining their dream's job, is having contacts everywhere. For sure, all readers going to know at least one case of a person that got a job because of a friend, teacher, parent, etc. Engineering Societies bring the possibilities of put in contact all the persons interested in the same engineering field. For example, according with the experience in the IEEE-UNED Student Branch, through the robotics workshops, all students with interest in robotics have been in contact, resolving problems together, developing projects or even just having fun in general

meetings. Of course, inside of this contact groups there are professors and professionals. Therefore, through the participation in the Society, professionals will meet students that can be a good future bet for their company. On the other hand, students will meet professionals that can give them a job in the future.

This kind of socialising can be seen in all the IEEE structure because of its division in professional Chapters and Societies: communications, signal processing, information theory, broadcast technology, etc. All engineers with a common interest will be put in contact easily through each particular society. In the IEEE-UNED Student Branch we have students with interest in several technologies. In this way, if they get enough people with interest in the same Society, they will be able to create a Chapter of the Society. The advantage of this is getting funds from the society to develop projects, the possibility to do contacts with engineers with interest in the same field and be informed of the new related technologies.

On the other hand, Engineering Societies are very important to achieve sponsors to student projects, because the enterprises get publicity and have the opportunity to evaluate at the students in real time. We don't forget that more of those students would be potential employees in the future and they would be trained in the last technology and resources of sponsor enterprises. At the same time, students know the enterprises around their academic specialities and have the chance to keep in contact with them before, during and after project finish. Usually, during academic years, students have to study old systems and technical resources, mostly obsoletes. Introducing enterprise vision in a real project, students can use new resources, even experimental resources, and keep in their minds the necessity of stay update in their studies and in their work if they want to be competitive.

An important aspect of this relationship is that Engineering Societies can act like a tool to show to the Bachelor's School the way to adequate academic formation and real work. This mechanism could be seen in the collaboration of both sides; Schools and Enterprises; through the Engineering Societies in the elaboration and preparation of contents of academic studies. Joint projects and periodical activities would be the better way to keep and enrich this contact. These activities could offer to the enterprises a real vision of the weaknesses and the strengths of the students to solve and potential those weaknesses to get the best of them.

Finally, we can think of this relationship is a cost or an investment for Engineering Societies. We must not forget that Engineering Societies are formed by enterprises and institutions. They work with money and they plan their investments, actions and efforts to achieve the success and challenges. As we said, these activities and efforts focused on students are, without doubt, an investment. There are many reasons: new trained professionals, new future and motivated employees, important marketing activities, better knowledge about employee market, and a way to show the Engineering Societies, and their member enterprises, the important social implications they provide to the society.

### III. MOTIVATION IS THE KEY

It is difficult to keep the attention of students in an academic class, but it is easy keep the attention of everyone in a game or in an enjoyable activity. This objective is the path of a teacher. If he/she want a thoughtful audience must turn his/her class in an interesting moment for feedback, interchange of opinions, look for answers, and above all, set out questions. What can we do about motivation? The answer is simple; student must be involved with the lesson. One of the ways to accomplish this goal is to transform the student into a teacher. In several workshops the IEEE-UNED Student Branch have worked with students with knowledge about robotics, electronics, web development, etc. in this cases, student has been invited to participate in the class like a teacher, he/she have to explain the others students the lesson of the day or, in some cases, he/she can suggest the lesson of that day. This activity reinforces the attention of students and increases their self-esteem.

It is true that this kind of class requires more flexibility and participation from teachers, but in a few time this effort is rewarded with the attention of students.

With the attention focused, we can look for motivation. Everyone has skills but not everybody discover them. In this moment, teacher has the opportunity to show at students how other people works day by day in different; technical areas in our case; exploiting their capacities. Using Engineering Societies like a model, it is easy to show students how they can work in group, and the first thing they must learn is that in the group everyone is important and everyone has a function. What is the function? That is the first step to take the student at a motivation attitude. In our workshops this is the moment when the teacher hands over the word to every student and every of them have to show the others his/her abilities and how they can help to the group to achieve the objective.

As you can see in this moment, IEEE-UNED Student Branch is changing the workshop into a meeting, it have achieved to dissolve the figure of the teacher; although he/she stays there monitoring and supervising every step; and students are working together imitating how it works an associated group.

This is the moment to purpose a project or a challenge, because we have captured the attention. Students are motivated and that is the moment to prove if they can work like a team and have a success or if they can work like a team and to bear a failure.

We can say that this behaviour is the one of Professional Societies. Their members are working together to achieve one objective and if they fail, the Society give them support to accept the failure or reduce its negative consequences, if it is possible. In fact, activities like contests, or similar, are looking for foster this aptitudes in the students.

Motivation is linked with social activities too, like contest or similar. On this way motivation could be an economic price, an opportunity to work in a real project of one of the sponsor enterprises, technical resources (e.g. tools, information or publications), an academic publication with national or international importance, etc. Engineering Societies have the

possibilities and contacts to get these prizes. As we said, Engineering Societies act like a connection between different enterprises and institutions, they know potential clients and suppliers, and everyone could be future sponsors in a student activity, everyone could need publicity, employees or, even, new future clients or suppliers, because students today could be successful professionals or enterprising tomorrow.

In Spanish University for Distance Education IEEE Branch, we have other motivations to study. Usually, we join this university because we are workers and we want to grow up in our life and jobs. One of the motivations is that we cannot see the teacher neither all the students can receive face-to-face classes. So, one of the motivations could be to think that nothing can "stop" us in our chance to study, neither our families, neither our works, etc. Then, we can afford the study of the subjects with the idea of passing the exam, that really it is more than that, it is passing many issues of the life itself. Therefore, motivation is very important for that reasons.

#### IV. ACTIVITIES

According with our experience, main activities can be split in two groups:

1. Collaboration activities are looking for reinforce group figure in the real life environment. Projects are the most representative figure in this way. In the engineering field, we can find projects in public or private enterprises (NASA, ESA, Telecommunication Societies, Aeronautic Societies, Automation Societies, etc...) and usually these enterprises have representation in Engineering Societies so, when it is called a project for students it is a good moment to prove if they are ready to work in group, to assume responsibilities, and to involve in a common objective. If students have success or not, is not so important than they can think, the important is working together and learn for the next project. In fact, the most important thing is that regardless whether there is economic award or not, students have been motivated during the project and they have developed new skills during this time.
2. Individual activities are necessary because there is a leader in each group, or a project manager to take difficult decisions or assume failures if would be needed, but everyone have, in any moment of his/her life, to take decisions, to have success or to make mistakes. In this moment individual contests, or similar, show to the students their possibilities, their real skills and teach them how to acquire other tools to face the professional world.

To develop both groups the Engineering Societies give support, help and advice to call activities in this way into the student branches. Any of them would be:

- Technical Workshops: About students' career, like robotics, programming, wireless, etc. To develop their technical skills and complement theoretical knowledge.

- Non technical Workshops: About management, leadership, marketing, organization, e-commerce, e-learning, etc, offering tools to complete student formation.
- Nationals and internationals congresses; conferences and other meetings; travels and visits to different places (NASA or INTA installations, private or public companies, etc.). There, students can meet other students and interchange experiences; or with professionals, generating an interesting feedback for their learning.
- Contests, projects, or championships for the students to motivate, award and recognize the students' efforts every year.

IEEE-UNED Student Branch organise some similar activities in different Associate Centres of UNED in Spain and we can say that results had been very positive.

Taking a look over the activities, we can find out some of the most successful activities of IEEE-UNED Student Branch:

- Robotic workshops: Initially, professors of UNED with the collaboration of some students did an initial workshop. Through it, students had the opportunity of learning with a real robot the basics of robotics and automation. This initial workshop let students organize their own workshops, until the point that now every year IEEE-UNED Student Branch has one or two workshops about robotics in several centres. Now, those students can be proud of having reached a third position in a national competition of robotics. The role of IEEE was essential to reach the success of this activity because part of the sensors used by the students was bought with IEEE funds. Currently, some students are thinking in doing a Chapter of the Robotics and Automation Society, to have access to the latest information in the robotics technology and even more funds to get new sensors or develop new activities to continue going into depth in their knowledge.
- SSETI SWARM project: Students of IEEE-UNED Student Branch got the opportunity of participating actively in this project to develop a Cubesat. All the participants have gained very important skills for their future career (work under a deadline, management, communication skills, and work in group).
- National and international student congresses: IEEE puts the funds and organizes multiple conferences for students. In Spain, we can emphasize the CNR (National Branch Congress in its acronym in Spanish), which every year concentrates students from all Spanish Student Branches. It let them meet students with the same areas of interest of the whole country, share experiences and ideas, learn about the activities of other branches, start projects and extend one's

social network. At an International level we can find the SBC (Student Branch Congress) which meets students of the entire IEEE region 8 (Europe, Middle East and Africa). This is an amazing congress for students because they can socialize with students of several countries, know about the engineering concerns in each country and even try to start student international projects. All of this without forgetting what they can learn in the congress about leadership, career development, communication skills, etc.

- IEEE congresses and paper presentations: IEEE organizes plenty of conferences with special offers to students. In those congresses, students have the opportunity of learning about the latest technology in different topics.
- IEEE online webinars: IEEE offers online seminars and students can attend to them and learn from experts the news about the engineering technologies.

Obviously, this is an ideal stage for the companies that look for new qualified employees.

#### V. THE IMPORTANCE OF FEEDBACK

One thing to remember in this kind of associations is the fact that their development is based on volunteering. That means that every participant in the Society is collaborating by free, or even they have to pay to belong to the Society. For that reason, the Society has the obligation to offer compensation to every volunteer collaborating in the activities.

Here there are two profiles which the Society has to cover offering a feedback.

In first place, we can find students. They want to learn, they are looking for developing a great career and they want to know how the real life works. After reading that, the reader can think that is all done: they have all they want and need in the Engineering Society. Unfortunately, it is not so easy.

The experience in IEEE Student Branch of UNED tells us that almost all activities have to be organized by students. That means they use their free time to pursue the success of the activity after a tiring day at the university or, if we speak in the concrete case of UNED, after a hard day of work, study and attend the family responsibilities. How can we achieve the involvement of the students in their free time? Engineering Societies have to show them that they are not going to get only some extra knowledge about the topic of the activity. Recruiters are looking for people who have good communication, leadership and organization skills, who are capable to work under a pressure of a deadline and with capacity of working in group. Students have to see how they can develop those skills through the organization of the activities; they need to know that they are using their time to gain abilities that going to put them in advantage in a job interview in front of people who have not participated in any society. Moreover, because of pure practical feature in the

activities done in Societies, all students will get a real vision about all the theoretical studies they have done.

Following this way, we are going to have two kinds of students inside of the society. On one hand, it is possible to see the "active" student, who is the responsible of the development in the activity. This person will learn new skills that cannot be learnt inside of a classroom, such as previously described, and he/she will need use one's free time. In addition, the initiative showed by the student, will put him in contact with professors in a closer way, having the opportunity of getting involved in their projects and therefore, and learning advance knowledge in the topic of those projects.

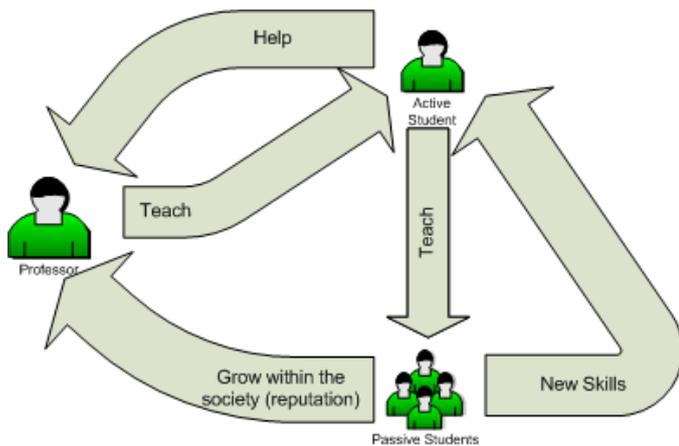
On the other side, we find the "passive" student. This will be the person who belongs to the Society only for the advantages of being able to attend to the courses and activities done within the Society. Of course, the pupils will be able to participate with both roles depending on the activity.

In second place, the professor/tutor profile. We have to think that professors in Universities have their own projects, obligations and duties. In most of the cases, the Societies have limited economic resources, so they cannot offer money to professors to help in the activities. For that reason, it is necessary to find a way to attract tutors in the activities that are developed within the Society. Professors have their career done, it is improbable for them to learn something interesting in these extra-activities and almost for sure, they may have a complete CV that does not need more elaboration. So, how can we do it? Maybe a professor has their career achieved, but there is something that whatever engineer wants to get within their career: reputation and recognition.

IEEE, as engineering society, let people grow up inside of the organization. To get a promotion, they must do something to contribute with the society and with the engineering community. As professors, they can collaborate in create a new student branch inside of IEEE and get more members for the society. Moreover, IEEE offers to the students the possibility of giving awards to the mentors that are helping them. Through an active collaboration as tutor, students will give them that recognition. This fact will help the professor to have more reputation inside the society.

Finally, they will be able to see in first hand, students that are more brilliant putting in practice the skills learnt in the subjects, that show more initiative and that have good ideas to develop projects. This will let to professors, selects students that can help them with their own projects.

Figure 1 represents a summary of the feedback given for the Engineering Societies:



**Figure 1.** Feedback work flow.

The following are the roles involved in this process:

- Active student: He/she will develop new skills with the organization of the activities (communication, leadership, organization, work in group, etc). He/she will learn advance knowledge collaborating directly with the professor, and will be able to transmit this new knowledge to other students.
- Student Group (passive students): He/she will learn knowledge from the active student and will let the active student to acquire new skills. They will recognise the help of the mentor.
- Professor: He/she will be able to select the most appropriate students to help him in his/her projects. He/she will help in the activities done in the society, and will grow up in the society and get reputation and recognition.

## VI. FROM THEORY TO PRACTICE: IEEE STUDENT BRANCH OF UNED

Since 2004 we work together in IEEE Student Branch UNED. The first steps were very difficult because UNED is a distributed geographical and physically University. At the beginning, our objective was to develop several work teams in different Associate Centres of the UNED in Spanish geographic: Madrid, A Coruna (Galicia), Terrassa (Catalonia) (Figure 2). Today, IEEE-UNED Student Branch can brag about have achieved this objective and go far away.

The key was the strength collaboration with IEEE organization and the hard work with students interested in learn more about engineering and cooperation like a work team.



**Figure 2.** Scheme of distribution of the activities in IEEE Student Branch UNED: an example of collaboration between IEEE (Engineering Societies) and UNED (University).

Why IEEE? Many reasons can answer this question:

- It is an international organization: This is an important point because most international and national enterprises belong to IEEE and this is an advantage for students that find closer new opportunities of work.
- It is the bigger Engineering Society in the world with more than 350.000 engineers belonging to it in 150 countries.
- The academic teacher of IEEE-UNED Student Branch and counsellor knows and belong to it. It was very easy for students of UNED to link with IEEE for the experience of one of its members. Students knew the possibilities and benefits of this Engineering Society and they knew the mechanism to belong to it.
- IEEE manages most of the international standards in Engineering. Belonging to it makes easier to know the latest researches and technological advances in many fields that engineering students have to know. This is very useful in order to have the best and upgraded formation; and information; in this fields. The only fact of being member gives you the access to IEEE Spectrum Magazine, The Institute Newsletter, IEEE Potentials Magazine and more. It will let members be informed about all the new technologies and save time in future as one does not have to "reinvent-the-wheel". We have to think that these IEEE publications are not available on Google for free, so the membership of IEEE can save time in research.
- Long years of life. IEEE is 125 years old, years of investigation, knowledge, standards, linked market and technology, linked enterprises and Academic institutions, linked governments and engineering.

Definitely: a lot of experience to absorb and to use for students.

- And networking. A lot of possibly contacts, to learn, enjoy, participate in contests, and even to teach or to work. An important and recognized organization like IEEE has the possibilities that student wants.
- IEEE offers multiple advantages for students to develop their career, like scholarships, the continuing education partners program or the IEEE job Site, which let look for jobs and career opportunities.
- IEEE is a very successful institution with a worth recognition for all the companies. IEEE offers the possibility of getting professional certifications to demonstrate your professional abilities. By gaining these certifications, you will enhance your CV with an international certificate with credit in all the companies.

On the other hand, by using several of the resources of IEEE, we have been able to call and organize several projects during recent years. For example, in 2008/2009 term these have been some of our activities and projects:

1. Annual Workshops: We are working in workshops about different areas in A Coruna and Terrasa Associated Centres.
  - Robotic Workshops: Today, IEEE-UNED Student Branch have a lot of activities related to robotics like coordination of contest, conferences about it, "webinars" (on-line seminars), etc... Student Branch is looking for more interaction with enterprises in this way, to give to students more opportunities in employee market in their future.
  - Wi-Fi Workshops.
  - PIC's Programming Workshops.
  - Joomla Web developed Workshops.
2. International Projects: Working like a team let members of IEEE-UNED Student Branch to take part in international projects. At this moment, students are working in two of them:
  - SSETI Swarm Project: In collaboration with other international universities some students are working since august 2008 in a space project where their work is designing and building a communications system to keep in touch a satellite with ground on Earth and vice versa.
  - Proposal to REXUS/BEXUS project from E.S.A. (European Space Agency): In this moment, IEEE-UNED Student Branch has a team working in the

proposal to send to ESA in a space project for European students.

3. Informal meetings to explain our activities and present new projects: These informal meetings are executed during different months along the year in the Associate Centres of UNED. We explain our activities, offer our infrastructure to other students and talk with them about IEEE and other Engineering contests and activities in and out of our country.
4. International meetings with other students and with Engineering Societies to link students and enterprises: IEEE-UNED Student Branch has been enjoying in last meetings in Lisbon ISBC, London SBC, etc. Also, Student Branch has coordinated a Robotic International Contest in April 2009. In fact, the success of this events, are encouraging us to organize the next Spanish National Student Branch Congress with participation of international students and collaboration of Portuguese students branches.
5. Web resources: to keep in touch every moment we need to use tools like MSN, Skype, Google docs, Internet is our better tool to link different cities in our country and develop projects together despite the distance among us. Obviously, we have meetings when we have the opportunity, but sometimes distance makes it very difficult. In these cases, we use Internet tools to solve our technical problems, coordinate our projects, and organize our workshops. Discipline, a good use of time and organization are the keys to make this methodology works.

Definitely, contacts, links, enjoy, but also earning, formation and work. Engineering Societies may work like the nexus between real and academic life, they can be the support of enjoying and funny during academic years, and they can make that students' formation will be complete. Not only academic knowledge builds good professionals, but relationships, market knowledge, organization, etc. All these characteristics and skills will make of student a better professional in the future.

## VII. CONCLUSIONS

At first, we can think that Engineering Societies and students are not related, but we are wrong. The relationship is very important, because both concepts have a big interdependence and they are complementary. Engineering Societies are useful to students, because they contribute with theory of the practice given in engineering degrees.

Definitely, two ways but only one objective, growing like highly-trained students is the key to allow Engineering Societies have highly-trained professionals. Often when students finish their academic career the labour market has to contract and train them again. That supposes money, time, and a considerable effort for the enterprise and the student. If we keep in touch student and Engineering Societies, during

academic years, we are reducing that costs and we are showing at both sides to use the potential of academic and enterprise philosophy, the basic formation in Engineering and the specialization in different markets and business engineering fields. In fact, what we are doing is forming realist professionals and taking advantage of their university formation to put into real engineering practice. Through the use of Engineering Societies, students, besides additional study motivation, also gain experience in scientific experimental design, project team work and management which are important knowledge for their future careers. Moreover, if Societies help students to grow up in their careers and form new professionals, they will keep alive their own future, because are these students who have to be part of the Engineering Societies in the future.

We must think that students today will be the new professionals tomorrow, and they have the responsibility of improving life, environment, technology and security of our future.

If students have the support of Engineering Societies they can know their weakness and solve them. Then they can fight against the new challenges of the real world. On the other hand, Engineering Societies can know the abilities of future employees or professionals and show them how work like a team, how engineering enterprises actually work, and how use their knowledge to boost the enterprises and institutions they will work for.

Our Student Branch is an example of this rich exchange between students and Engineering Societies, between academic and professional life, it is, between theory and practise. All this effort will be beneficial for the two sides: students will be better professionals and will have more skills to solve problems in their future work. On the other hand, Engineering Societies will have new active members with new professional contacts that will look for new technological challenges and will enrich the knowledge of Engineering Societies, reinforcing its role in the society.

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