

ACTUAL WORLD: APPLICATIONS AND INDUSTRIAL COLLABORATION

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Abstract -*In this work we approached a project in that through the University, more specifically the Schools of Engineering, it cannot in agreement with modern teaching techniques to the distance and up-to-date communication means to take solutions, improvements and challenges to the companies of the most several branches. Therefore, settling down a partnership of high level, innovative, objectifies and low price dealing with Engineering.*

Through this process the University has conditions of offering what the company wants, needs, or intends in a fast, direct way and of low cost.

Introduction

It is known that, already ten years ago, in the United States teachers began studies in the attempt of reformulating the engineering teaching, worried with the researches and methods used until then. Still today, this concern continues in that country. They are now developing ABET 2000, organ that evaluates and it recognizes the courses. The established approaches, for originating from the Schools of Engineering it establishes the following abilities: in the application of knowledge in various discipline, in the execution of projects and experimentation, in the capacity to work in group, in the capacity to recycle renewing the knowledge and in the capacity to accomplish projects and to develop systems for a certain need. With base in these approaches the competence of the school establishment to edifice the engineer. Us, here in Brazil, already began with the National Exam of courses that is evaluating the graduation courses. After some evaluations, in dependence of the concepts obtained by the course he can be even closed. Will it be the right procedure? Will it solve the problems that afflict our education? Is it right in the end of the course, through a simple test, is to verify the student capable or not to enter her in the labor market? To verify if he is an engineer or not?

In this work we developed some comments the alteration of curricula it doesn't just remain, innovations discipline, but we characterized the differentiated focus that it should be given to the engineering students, to adapt them to a perspective of the engineer of the year 2000!

Management and Knowledge

We understood that the engineering is not a school just for the solution of problems. Fits to the engineering a mission much more nobleman than this, that is to say, she should workout for the construction of projects that don't present problems. It fits to the engineering to workout for the taking of decision. It should workout for low cost projects and competitive technologically. Yes, it should not just workout, for in the mediocre continuity, of the same always. It is in the school that should wake up the creativity, to develop the habit of "to engineer". But "to engineer" for the world, with projects executable that seek the humanity's good, tends as base the current industrial compatibility. Today we lived a phase of transformation of the knowledge, a management revolution, that is the application of the knowledge to the knowledge. To " provide knowledge to discover the best way to apply the existent knowledge, to produce results is, with effect, what understands each other for management " (according to DRUCKER).

Now he discusses the competence of the University to make the bridge of connection of the knowledge, its ability to endow, to transfer and to give the abilities waited by the industry. It is necessary that it is adopted for the University, the vision of the contemporary industry, that it doesn't only intend the quality control, but it is going beyond, that is the warranty of a true quality of the product. It is the management of knowing to guarantee.

Curriculum and Preparation

Already in the beginning of the course of Engineering the students are confronted with a weighed load of Physics and Mathematics and they don't approach anything than they can associate with the Engineering. This besides not stimulate anyone, is excessively frustrating. This is a reason for the which the students' great majority that abandon the engineering makes it in the first years of the course. Then a to modernize immediately of the curriculum makes herself necessary. Already in the first semesters the students should have contact with the engineering, with the one that she is, and with its objectives. It is necessary to bring for the first semesters the projects, the studies, the problems, the solutions, the experiences, the researches, the vision and the contact with the engineering. There would be like this incentive for the continuity of the course, the students to have more time for the choice of the improvement

area and what is fundamental, they would not learn science separate from the facts and phenomenon, what understands, be today, a crime of it hurts the intellectual.

On the other hand, in relation to the these students' preparation, in earlier levels, it is fundamental that they are prepared for activities, of high technological content, inside of a managerial market excessively competitive as what we found now. Then, what to do? As what already happens in some schools of Engineering of the country it is indispensable to do use of the calls disciplines electives and Special Topics. Why this? Due to the fact of, have them a number of variable credit, they can allow the introduction of new contents, allowing like this the constant modernization of the curriculum, without waiting several years for the introduction of new disciplines. Basically the disciplines, Special Topics, turn the most dynamic curriculum, allowing like this, to form students with professional paper in agreement with the needs of the market. The school is adapted to the labor market where the technological evolution quickly turns obsolete several disciplines techniques.

School-Company

Now the engineering programs focuses in the systematic simple of the learning to move the axis of the teaching-learning process, focuses in the student. The student must interact with the teacher, with the colleagues, with the technicians and with the company. This model should be altered urgently, so that the teacher leaves the owner's of the knowledge traditional posture to assume the orientation paper, mainly in a context where there is a symbiosis between company and university. Here, the teacher assumes a very important position. Today, a lot of companies use the trainee as a cheap labor, without any concern with its development. It is necessary that the student's experience with the company is a formative experiences, objective and positive, and so that this happens it is necessary a planning, a programming well delineated, established together with the company and the school. It should have a real commitment with the these new professionals' formation. These students should develop work projects previously discussed with the school, executing programs adapted to the needs of both, school and company. Here the participation in courses of continuous formation is of highest importance. For the companies that have need to compete in an globalized economy, with wild technological progresses, its relationship with the university is promising, with the development of new products, use of new materials and betterment of existent products. In compensation, that relationship will be reflected in the new professionals' profile, that will be more capable for the market than wait for them.

There are several integration forms, between school and company, such as: project development

together, development of researches, students' apprenticeships and technicians, companies juniors, specific or continuous formation courses, use of laboratories and shops, consultation and technician-scientific consultation made by students and teachers. Whole these are forms of decreasing the distance between the school and the company. Mainly when the communication at the distance is facilitated vastly, as what it happens today. This convenience is of vital importance for both and a benefit to the society. It is fundamental that the engineering student today, be provided of conditions and opportunities to acquire and to use the new tools addressed to the real world of the industrial applications while, simultaneously, be getting ready, acquiring the basic knowledge in this wonderful area that is the engineering.

An attempt of introducing the industry in the University is the program of technical residence, now to have recently-formed. Referred him program is being applied for the first time in the Mechanical Engineering of PUCRS and it is already structured in the same molds of the training developed in the Department of Civil Engineering. This technical residence is constituted of an apprenticeship of one year, that students recently graduates, make under orientation of the university and supervision of the company in which the trainees should go by the most several sections of the company, executing a program of activities, previously, determined together between the company and the university. It is important to stand out, also, that parallel to the apprenticeship activity is important that the graduate-student makes courses of complement adaptation to its function.

Another form of integrating the school to the company, in the masters degree courses is it called driven "Master", where the professional is integrated into the university, bringing a problem, or researches specific of the company to be solved in the university. In this case the engineer arrives to the university in search of the integration, of information, with the objective of analyzing alternatives, and to look for innovative solutions, integrating knowledge with objective needs. In this process we understood that everybody has to win.

Conclusions

With the made placements it tried to show some of the difficulties that come in the teaching of the Mechanical Engineering, with the perspectives of solutions based in the realities observed in these courses, where basically, we see as promising the integration school-company, tends as foundations:

- a. Reformulation of the curriculum with the entrance of disciplines of the professional area in the first semesters;
- b. Introduction of disciplines Special Topics that are adapted to the technological progresses and they give flexibility to the course;

c. Development of “Master driven” in the masters degree courses, that it integrates the company into the school, in a direct way, objectifies and consistent.

d. Introduction in disciplines of the professional area, the “optional disciplines” for to amplify the knowledge and to develop the personnel aptness of the individual student.

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