

MBA in Social Engineering: Designed Program for Present Society

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INTRODUCTION

Political environment is full of challenges and crises of deep consequences to society as well as to the environment and it has a strong incidence in terms of decision making in any field. It means that taking decisions is becoming more and more complex and difficult due to the fact that the implications are felt in a faster way and in a larger community. For engineers, the decision process is even more complex once the implications have serious impact not only to the target customers but also to the society as a whole and to the environment. This is an aspect that shows the necessity for engineers to search for the acquisition of an ability to respond to social necessities having in mind the cultural aspects when developing a project.

The effects of this aspect in engineering education implies a different approach providing the future engineers with notions on policy, ethics and social sciences, which are so important to prepare them to the future work market that will require the respect and promotion of society and environment as assets [1].

Most of social groups have ambiguous understanding about science and technology; some understand it as responsible for the environmental deterioration and the voracious capitalism and others as the ones responsible for the better quality of life with the improvement of health systems, agricultural production and other accomplishments. Both perceptions are not far from the reality. In any case, the impacts can be seen along the history and more recently with the sophistication of the so called "information society". This particular "information society" shows how strong the impact of any technology introduced in society can be. Real time communication and brutal amount of information available have drastically changed how people relate, make business and study [2].

The proposal of COPEC - Science and Education Research Council for the next five years is the offering of an MBA by Distance Learning due to the new global education demand. The new programs will be delivered in Portuguese in a first moment, for all Countries of CPLP - Portuguese Language Countries Community. The idea is to cover these countries that also are seeking for opportunities, as the majority of them are developing and are very wealthy countries. The first group of programs is: MBA in Social Engineering and MBA in International Engineering Educator, both with International Recognition.

1 SCIENCE, TECHNOLOGY AND ENGINEERING STATUS IN PRESENT WORLD

Many Countries in the world have recognized the importance of engineering in the world scenery. Therefore, they have been working to get the competitiveness of national goods and services by means of incentive to create projects of qualification of professionals through lifelong education, for example, and others. Leaderships, many representative groups and agencies have been implementing programs to prepare engineers to increase the efficiency of the research system, experimental development, engineering, producing system and the market [3].

All these efforts have been having a kind of smooth effect once it is one of the most difficult and expensive programs of College level, which does not help with the inclusion policy. However, some Colleges have opted for a softer engineering program offering them in the evening. These programs are lighter, more focused in technical knowledge, and less focused in basic sciences. The students in general work all day and choose engineering programs because it is a way to be promoted at work [4].

A third degree diploma opens some doors. It means not only the possibility of earning more money but also to reach an upper status, socially speaking. It is a fact that, even being a lighter program for the students, it is very demanding and in general it takes them more than five years to complete. The diploma has the same value of a program that prepares engineers of conception. In a certain way, it helps the inclusion policy of education although the number of engineers has been decreasing considerably in the last 10 years [5].

2 COPEC'S VIEW OF ENGINEERING FORMATION

As an organization that works for the future of education, COPEC has established some guidelines to be applied on the design of engineering programs. The guidelines are the result of researches as well as experience designing and implementing engineering programs [6].

- The programs should be flexible;
- Have more practical activities;
- Internships as a way to provide real experience in engineering.

The formation of the engineer must consider above all the strong basis in basic sciences and basic sciences of engineering and the programs should instigate the students to be willing to develop some skills such as showed below:

Basic Sciences

+

Basic Sciences of Engineering

+

- Aptitude to conduct and implement projects;
- Responsibilities for actions and results;
- Creativity and innovation potential;
- Mastering technologies' evolution;
- Positive attitudes and behaviors;
- The willing to learn all life long;
- International experience;
- Entrepreneurial mind;
- Respect towards diversity;
- Communication skills;
- Team work;
- Strong ethics.

These capabilities can be instigated in the students by means of new education proposals, exchanging programs, international experiences, double diplomas, internships, technological initiation and other feasible implementation in the engineering programs [7].

3 THE MBA SOCIAL ENGINEERING PROGRAM OFFERED BY COPEC

Thanks to technology it is possible to conciliate work and studies once online programs are available for all and in every possible way. It is the era of the so called information society.

Information is available and what to do with it is what makes the difference between having the information and using the information for good or bad purposes. This information acquisition possibility, for all and at any time, is what is pushing teachers

to become masters in advising and not mere knowledge providers. It is pushing teachers to become more aware of what is going on worldwide in their fields of expertise and also to develop collaborative work with peers, in order to be able to advise the pupils to achieve and to use information for a knowledge construction, pertinent and useful for their activities as professionals.

This broader education paradigm is not a new idea; under Napoleon governance the French School of Engineering formed the “Engineer” that used to prepare the nation’s leaders with a high profile of technical knowledge. After the globalization, with all the discussions about introducing humanistic courses in engineering programs, the results have been humble. Nowadays it is difficult for engineers to address technology to solve social issues rather than to apply technology regardless of social needs [8].

The design of a project now requires knowledge about the social as well as the environmental impacts, so engineers should be capable of learning how to work closely with governments and communities, addressing the results of the projects to solve social problems or at least to prevent new ones.

In response to this necessity, COPEC - Science and Education Research Council has developed a MBA in Social Engineering. It is an MBA program offered by distance that fulfills the urban demand of engineers to solve social problems that are outcomes of urbanization and environmental issues in cities.

Specialists in all areas of social science and engineering are an extremely interesting asset for any enterprise of construction. It is a very wide field covering most national and international construction industry. There is also an increasing demand for consultants with specialist knowledge in public economic system, scientific writing, venture capital and marketing, expertise for governmental bodies, city planning and authorities, as well as a large demand for PhDs within the area.

The program is directed at engineers interested in acting in this field-offering consultancy for construction companies, industrial enterprises, city halls and governmental housing organizations, etc. It is a transdisciplinary program that prepares engineers to work in projects dealing with the social aspects of projects.

4 PROGRAM ADMISSION REQUIREMENTS

The basic candidate requirement for admission is to have a bachelor's degree in civil engineering. However, the program encourages applicants from diverse backgrounds, including (but not limited to) engineering, environmental science, management and economy. Applicants may need to complete prerequisite courses. A faculty advisor will determine the specific requirements on an individual basis depending on the student's educational background and work experience [9].

It is a program for those engineers who wish to become specialists in social engineering in order to work in business or gain knowledge about social problems, how to avoid them or solve them when developing a construction project, for example. Big projects currently need to take into account the social aspects that can cause discomfort and consequently conflicts of interest of the community where the project takes place.

It is a program designed for those engineers already working in enterprises, municipalities, or those engineers who just left university for an update of knowledge about social aspects of engineering practice.

5 THE CANDIDATE PROFILE

- Interest in themes related to the sciences of mathematics and physics and technological others of civil engineering;
- Interest in solving problems in engineering in coastal and estuary environments specially the ones that involve the coast and constructions;
- Capability of questioning;
- Affinity and discipline for the activity of research.

6 PROGRAM DESCRIPTION

The two-year program (120 ECTS) consists of courses amounting to 90 ECTS, followed by a Degree project (30 ECTS). The system is compatible with ECTS credits. It is a Distance Learning study program and the language of instruction is Portuguese.

The program includes the courses as follows:

- Game Theory Overview;
- Applied Mathematical Methods for Social Issues;
- Analysis of Social System;
- Basic of Law Systems;
- Design Theory of Public System;
- Public and Private Policies Aspects;
- Environmental Economics and Public Policies Generalities;
- Housing and Land Policy Analysis;
- Introductory City Planning;
- Macro and Micro Economics;
- Public Economic System;
- Aspects of National and Regional Planning.

At this level it is important to propose and develop a serious research project that includes the method of solving the social problem, which is the subject of the study. The degree project amounts to one semester (30 ECTS) of dedication to develop the final work and it is undertaken during the second year. The thesis topic may be chosen from a list of topics suggested by the teachers, generally carried out in the area defined by the courses taken during the first year of the program. The project may be carried out either in the industry, or in another university or research institute, anywhere in the world [10]. It means that the attendees of the program can apply their knowledge to develop projects with social considerations as integrated part of it; or to propose a project for their community, or for the municipality.

The number of possibilities is vast once the dynamic society in which man lives nowadays is more and more complex and mutant. It is an aspect that leads to the necessity of an investigation about an issue that is real and which solutions are feasible and able to be implemented in a short time. The most important aspect of such program might be the social analysis of a real problem, which demands a certain amount of efforts in the search of economically sustainable ways of solving it.

The program is developed in modules: one module per semester. The scores and the final project presentation online establish the final approval of a student. A chat with students enables teaching and guiding the development of projects in a broader perspective.

The MBA is taught almost using case studies—whereby students discuss real dilemmas faced by actual companies. The debates are online and last for three or

four days. The professor opens up the discussion by asking questions and the students then begin discussing the case.

As the target audience is spread in different continents, the cases are discussed in an Internet forum. Students enter the discussion at the time that is best for them. It can be early in the morning before going to work, sometimes in the evening or even late at night. Usually they will be involved for two or three hours every day. The choice of asynchronous learning mode of delivery is due to the fact that participants access course materials on their own schedule and so it is more flexible [11]. However, there is the possibility of a present module for pertinent seminars and visits to companies and sites with the goal to enhance the acquisition of knowledge and experience in the field.

7 LEARNING ASSESSMENT

The evaluation of learning is continuous, prioritizing qualitative aspects related to the process of learning and student development observed during the conduct of the proposed activities, individual and / or group, such as surveys, reports of activities and visits, diagnostic case study or prognosis of work situations and also developed projects.

The observation should be based on criteria and performance indicators, as it is considered that each expertise brings in itself a certain degree of cognitive, behavioral and evaluative experience, which can be translated into performance. Thus one may say that the student acquired specific competence when the performance expresses this level of qualitative requirement.

To guide the evaluation process and make it transparent and able to contribute to the promotion and regulation of learning, it is necessary that the performance indicators are defined in terms of teaching, explained and negotiated with students from the beginning of the course, order directing all efforts of the technical staff, teachers and students themselves to achieve the desired performance.

Thus, it is expected to enhance learning and reduce or eliminate the failure, since education competency involves ensuring conditions for the student to overcome learning difficulties diagnosed during the educational process. The self-assessment will be fostered and developed through procedures that allow students to monitor their progress, as well as the identification of points to improve, practice deemed essential to learning autonomously [12].

The result of the evaluation process will be expressed in words:

Optimal: able to play, highlighting the competencies required by the profile professional conclusion;

Good: able to perform to the satisfaction, the skills required by the professional profile completion;

Insufficient: still not able to play at least the required skills the professional profile of completion. The endorsement will be awarded per module, considering the criteria and indicators performance related to the powers provided in each, which integrate professional competencies described in the profile completion below.

8 PROFESSIONAL PROFILE

The engineer with an MBA in social engineering should present some characteristics as a professional. These expected characteristics are:

- Search for constant updating and self-development through study and research, to propose innovations, identify and incorporate with criticism new methods, techniques and technologies to their actions, and respond to everyday situations with unprecedented flexibility, creativity, resourcefulness both social and cultural;
- Taking professional attitude consistent with the principles governing the work area, working in multidisciplinary teams and relating appropriately with other professionals, clients and suppliers;
- Manage the career with initiative and in an entrepreneurial way, to provide services or organizations to conduct own business;
- Acting responsibly, committing to the principles of ethics, environmental sustainability, the preservation of health and social development, directing its activities to the values expressed in the professional ethos, which results in quality and commitment with work well done.

These characteristics are important because a social engineer will deal with the aspects of human life that are imperative for the future of young generations. The achievements have a huge impact on how life will develop in a region or community in the years to come. Specialists working in the field of social engineering can make a huge contribution to the overall engineering profession.

9 PROGRAM GOALS

The main objectives of this social engineering graduation program are:

- to prepare engineering researchers and professionals in administrative positions who work in areas related to policy to design and implement socio-economic systems in national territory and to develop the integrated theories and methods of these areas;
- to increase logical thinking, sense of social ethics, social assessment capability;
- to start thinking without any preconceived notions;
- to look for innovative problem solving.

10 FINAL DISCUSSIONS

At this point some discussions should take place. We start with the definition of science, which states that it is a process of inquiry that involves questioning, hypothesizing, investigating, gathering evidence, organizing data, testing, refining, predicting, explaining and communicating. So the development of science is a long process that requires some personal skills that can be fostered along the education period of the human being. The achievement of knowledge in order to make science respond to human needs results in technology that men use to make life better. Due to the challenging characteristics of scientific knowledge application and development it is possible to say that it is in constant construction. This is what makes science and technology development so interesting and enticing for those professionals who are always seeking for new ways of working, meaning more effectively.

Presently the bachelor diploma is not enough to obtain success in a career. No doubt that a third degree diploma opens some doors. Therefore it means not only the possibility of earning more money but also to reach an upper status, socially speaking. However, as the work market is more than ever extremely competitive and mutant, lifelong learning is something that professionals should pursue.

It is a fact that online learning is not for everyone at this point of human development stage. It is very difficult to juggle work, family and study. Plenty of self-discipline is necessary. However, the idea to study at any time or any place that suits the students best is very appealing. Another aspect is that it gives an opportunity for bright students in different remote parts of the world to access a top-quality education program, which would otherwise be unavailable to them. Distance-learning students tend to apply what they have learnt immediately in their work, making their studies more practical.

Competitive modern marketplace demands rapid change and innovation, for which distance education programs can act as a catalyst. It is a lifelong learning environment once it provides the students the opportunity to receive equal education regardless of income status, area of residence, gender, race, age, or cost per student. The proposed program delivered by COPEC constitutes another opportunity for engineers to acquire knowledge in their fields of expertise to defeat social problems mainly faced by urban agglomerations derived by the global population growth.

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