60 Years of Distance Education Experience

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Abstract

COPEC – Council of Researches in Education and Sciences has conceived and developed the Telecommunication Engineering Program, which contains in its curriculum the so called "Opportunity" - a time that student can spend having classes of other courses in other programs. Added to that they also have the choice of taking classes at distance of engineering courses others than the ones that are part of the program. The goal of this new kind of engineering education is to increase the students' perception of human dimension and how much it implies in the search for answers to the several problems of engineering to the service of human kind aiming at a better future. With the advance of science and technology and the Internet have increased this kind of education all over the world, becoming now a powerful tool to provide education with efficiency and quality. "Opportunity" project aims to form a new kind of engineer prepared to work in the new world order of 21st Century. Because of in education field the tendency is "life long education" to the new professional practice distance learning plays an important role for those who have to work and to study constantly. Another relevant aspect is the need of the engineering school to make the program more suitable to the new kind of student connected to the world by Internet and eager for information. It is certainly a way to get knowledge in the comfort of home or the nice environment of school library. It also helps to offer to the students' new kind of extracurricular courses which content is more interesting for this or that student. Initiatives like this have helped to overcome the prejudice about distance learning in the Country.

1. Introduction

The main goal of this paper is to show a project that has been conceived and applied in a School of Engineering in Brazil. It is a distance learning program that comes as a new tool and very powerful one that is capable to bring education in a fast and modern way.

Although it is not new in Brazil, distance learning has been passing through a complete redesigning to overcome the prejudice that because of a historical process is still around. COPEC – Council of Researches in Education and Sciences has come up with a smooth process of introducing distance learning in an Engineering Program. The research team has designed a Telecommunication Engineering Program, which is a project that has been named "Opportunity". The choice of the name is due to the importance of time along the program that are in general very heavy overwhelming the students with not very good consequences some times even leading them to give up in the middle of the program [1].

It is a Telecommunication Engineering Program, which contains in its curriculum what has been called "Opportunity", which is a time that student can spend having classes of other courses in other programs. Added to that they also have the choice of taking classes at distance of engineering courses others than the ones that are part of the program.

The goal of this new kind of engineering education is to increase the students' perception of human dimension and how much it implies in the search for answers to the several problems of engineering to the service of human kind aiming at a better future. With the advance of science, technology and Internet have increased this kind of education all over the world, becoming now a powerful tool to provide education with efficiency and quality. This way the students can develop some skills doing something that is enjoyable, taking different classes, learning different things.

2. COPEC – an organization viewing the future

COPEC means Council of Research in Education and Sciences. It is constituted by scientists of the several areas of human knowledge and citizens committed with education. Citizens and scientists who believe that education is the main beam in the construction of a better society and that also believe in research and in the development of sciences and technology as the big agents in the fostering of progress and the welfare of human being.

It is a council, which works have the goal to enhance and to maintain relations between universities, institutions of education, enterprises and the society of the several countries for the discussion of education, technology and sciences directions.

The history of COPEC has started with an idea shared by some professionals of sciences and technology. It was the idea of creating a non-governmental organization to foster the research mainly in education and sciences. This idea seized proportions and after some meetings the Council became reality.

Although very young this Council through its very active members has already a history of participations in scientific events in education and technology, also sponsoring conferences and developing projects since 1994, with the goal of enhancing discussions about education, technology and science congregating specialists of the five continents. Its mission is to stimulate and to foster the efforts to bring an international perspective in education. It aims to establish and maintain the interchange among institutions, educators of educational institutions in Brazil and in the several countries worldwide. It is a council that seeks the improvement of communication and the interchange of researches in education field and sciences between the countries.

It also aims the development of an apprenticeship community and the development of education and sciences areas constituting in an intelligent way of collective knowledge for the integration with social and economic agents of community.

3. Outlines about the Project

The project called "Opportunity" aims to form a new kind of engineer prepared to work in the new world order of 21st Century. Because in education field the tendency is "life long education" principally to the new professional practice, distance learning plays an important role for those who have to work and to study constantly. Another relevant aspect is the need of engineering schools to make the program more suitable to the new kind of student connected to the world by Internet and eager for information. It is certainly a way to get knowledge in the comfort of home or the nice environment of school library. It also helps to offer to the students some new kind of extracurricular courses which contents are more interesting for this or that student. Initiatives like this have helped to overcome the prejudice about distance learning in the Country [2].

In the "Post Industrial Revolution" era that humanity is living, the main characteristics are: the neo liberal policies, no borders, complete new values and different social relations and producing system. All these policies have modified human life drastically, in a non-reversible way, in many parts of the planet. In Education field the huge challenge for the Century XXI is to prepare the new professional for the new work market and in developing Countries like Brazil, the challenge is even bigger because there is also the urgent necessity to promote the development of science and technology [3].

4. Distance Learning Experience – A History of more than 50 years.

Brazilian Distance Learning Experience dates back form the 40's when two initiatives have to be mentioned as pioneer projects on distance education in the world: Brazilian government started the "Universidade do Ar" (The University of Air), which was the transmission by radio of first grade program. The target was to provide basic education for workers and people of remote places of the country. The other initiative is the one of "Instituto Universal Brasileiro" another institute that has done a very good work teaching by distance, more specifically by post. These Projects have put Brazil as one of the pioneers in Distance Learning.

During the 60's, in Brazil, emerged the "Telecurso 1º Grau" and "Telecurso 2º Grau", which consisted of classes of all courses of first and second grade, by television (Cultura TV Channel) and radio (every radio station). People could follow the content in details in the low price brochures they could buy at any bookstore.

These historical aspects of distance learning in Brazil have generated a kind of prejudice. The idea is that it cannot be good once it was conceived to provide education for illiterates and people with basic education although it is a good way for the dissemination of knowledge [4].

Until today, many initiatives have taken place offering different types of courses trying to provide education even basic one.

5. Aspects of the Program

COPEC – Council of Researches in Education and Sciences has created the Telecommunication Engineering Program that contains in its curriculum, which was named "Opportunity". It is called so because it is a time when the students have to attend classes in the several other areas of

knowledge in one of other units of University added by the choice of having distance learning courses of specific extracurricular engineering courses [5]. The main characteristics of this program are:

Telecommunication Engineering Program is in a College that belongs to the University that has other Programs in other fields like Nutrition, Arts, Communication, Philosophy, Mathematics, Computer Sciences, Nursery, Biology and so on. Inserted in the University the Engineering College can provide the students the access to other Colleges. The Colleges have signed an agreement with Engineering College in order to allow the Engineering students to have classes in their Programs.

Along the five years, the schedule has been designed in order to allow the students some time when they can spend attending classes in one of the other Programs of the same University. The students are free to choose among the many options like environmental, nursery, photography, design, fashion, languages, art, pure mathematics and many others. Whatever they want or what they feel that will enrich their formation.

Some extracurricular specific engineering courses are available at Distance Learning. They have been designed as an experience for later development of an entire Distance Program. It is not an easy task once it requires big financial investment and qualified staff committed with the idea to make it work. These aspects allied with specific economics issues faced by the private organizations in the Country besides the global offerings make it a huge task to be accomplished.

The students can choose some courses from other Colleges, in different areas as mentioned above and as many as they want along the five years, at least one per two years. At the end of the each period, they have to present a report about their development. This report is constituted of the student self-evaluation and the teachers' evaluation.

Once the student makes a choice in class, the student is evaluated as any other pupil and the scores have to be in according to the demands of the Program chosen by her/him.
At the end of the period they bring a report to the council compounded of a psychologist, a pedagogue, an engineer professor and the coordinator of the program, who discuss it and give the student the approval or not. The assessment has not the goal to retain the student just to provide her/him a self evaluation about their performance in other area.

The program is a five years program, under graduation, morning or afternoon classes. The students have the basic science courses, basic engineering courses and specific engineering courses besides the courses they choose to attend during the "free period" [6].

The curriculum was elaborated in according to the curricula directress established by the Federal Law No. 9.394 known as LDB - Basis and Directress Law of Education, of 1996 [7].

The objective of the University is to have a different Engineering Program once there are others in the same city besides the fact that a Distance Learning Program is an idea that is a good opportunity to enlarge the number of students as well as the financial incomes once it is a private

University. It is believed that it will increase the number of researchers in the filed and so to establish a good level of credibility in terms of quality program.

6. Distance Learning Course

To accomplish the effective implementation of this distance-learning course the students have available all the existent computational tool of the Institution (Teleconference, Chat, e-mail, etc.) besides a tutorial through the page of the course in the link of the course in the portal of the Institution.

Through the page in the Internet, interactive examples and simulations have been showing as powerful tools for the teaching of the Communication Systems course. The sequence of the course is showed through modules that count with introductory elements, theory, development through examples, interactive simulations and exercises for delivery (everything available on-line and off-line through " downloads " and e-mail). This software has been conceived in Java language. The students of the Communication Systems should create their own links associated to the main Link of the Computer Engineering Department.

For the conception of its sites studies begins in-group with the aid of monitors of Computer course of Computer Sciences Program using basic tools as Microsoft Front Page Express that is an editor in HTML language. The easiness of the use of its resources and the tutorial of the package allows a fast development of the students to the step that they get familiarized with the tools of Distance Learning.

Starting from certain point, after an evaluation it is very possible, to abolish the presence in class room, just limiting to monthly encounters with the monitors and teachers of the course for the evaluation and a correct feedback of the program.

The tutorial that counts with synchronous and asynchronous resources offers the opportunity, so much for the monitors students (of advanced years of the course) as for the students of the course. The subjects guided by the students of the course are under responsibility of the monitors, so that when they have to face subjects that are besides their knowledge, they go to the responsible teacher of the course that monitors and supervises the whole change of information. Scheduled and sporadic meetings are then combined among monitors, students and the teacher of the discipline, in order to accompany the pedagogic progress of the experience, once it not only a change of the communication means, but it is about a whole paradigm change, accompanied, evidently for the respective psycho-pedagogic impacts.

The modules of the course of Communication Systems (table 1, shows some examples of modules), they have been divided so that it is possible the necessary time for the approach of the subject, completely, and it cannot exceed week time determined for the hourly load of the course. Inside of the program of availability of the modules of the course have made use of Hypermedia, with the support of videos, tables, photos and some simulations as support to the theory.

The presence of the tutorial is a powerful tool in the elimination of doubts, not only in the use of the software, as well as for the resolution of the own suggested problems, through links of help.

The electronic mail shows to be the most used electronic way to remove doubts as well as for the shipping of answers of the proposed problems.

The team of monitors interfaces the communication between the educational of the course and the students, in the resolution of proposed problems and also in the elimination of doubts, having, however, the educational supervision in all the correspondents' communications and received through the protocols generated at once of the shipping and of the greeting of the correspondences.

Subject of the module	Time foreseen	Exercises	Computer Tools.
Notions of theory of the information	2h30min	5 for delivery	Internet Explorer, Acrobat Reader, Outlook Express
Convolutions	2h30min	10 on line	Internet Explorer, Acrobat Reader, Outlook Express e Chat
Discussion	50 min	-	Chat
Need to modulate and types of modulation	2h30min	5 for delivery	Internet Explorer, Acrobat Reader, Outlook Express
Noise in the exponential modulation	2h30min	-	Teleconference
Discussion	50min	-	Chat

Table 1: Examples of the modules of teaching at Distance of the Communication Systems course, time of duration and used Electronic Means.

The evaluation of the academic use can be made in presence with the application of individual tests and in-group tends. The score can be pondered by the remote participation of the students in case of a smooth implementation to avoid radical prejudice.

7. Profile of the Engineeer

The program proposed and has been developed to provide the future engineer a solid theoretical knowledge of hardware and software, having also the notions of economy, management and law.

S/he is prepared to specify, to conceive, to develop, to implement, to adapt, to produce, to industrialize, to install and to maintain computer systems, as well as to complete the integration of physical and logical resources necessary to take care of the information, computer and automation necessities and general organizations. S/he is a professional with training in new communications methodologies by means of Electronic (radio, Television, microwave, telephony, etc) [8].

In 2004, the first class has ended the program, the new engineers have provided a feedback about the Program, and their comments and suggestions ended as a parameter for next new experiences. In general, the Program has been suitable for them in a way that they had more contact with other careers approaches for the same problems. The possibility of having courses at distance increased the number of students that made this choice because they could study in the comfort of their houses at the time they wanted.

8. Conclusion

The creation and the application of this program were possible thanks to the new laws and perspectives that have been changed during the last years. The more flexibility in the creation of

new programs provides new opportunities to form professionals in according to the demands of work market.

It has been considered as one step further in engineering education once "Opportunity" is an opportunity to full fill the lack of some areas of knowledge that because of this or that problem it was not possible for students to achieve, like the knowledge of languages, or design and others.

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