

Fishing Engineering: A Customized Engineering Program

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Abstract

In order to form professionals committed with the creation and development of science, principally in engineering field the research team of COPEC – Council of Researches in Education and Sciences has conceived and implemented a different kind of engineering program. Brazil despite the low investment in education system is a Country, which in biological and engineering areas is not behind other developed Countries. It is a five years program of Fishing Engineering, which main characteristic is the inclusion of what has been named “Tapé-Apó”. It consists in extra classes of peculiar areas of human knowledge, specially selected to make the students to develop their abilities of applying their skills in the global context. Very close to the environmental and biomedical areas fishing engineering is a young field but that has been contributing to the development of exploration techniques, conservation and correct use of natural aquatic resources. Fishing engineering is rooted in Biological Sciences (Ecology, Biology and Genetics) with Earth Sciences (Physics and Chemistry) and Mathematics. Those disciplines give the necessary basis to understand the aquatic atmosphere and its resources. The practical classes and the laboratories take half of the schedule and they approach techniques and location technologies, creation and reproduction of aquatic species and of industrialization. It is a program that will fulfill the lack of this kind of engineer in the Atlantic Coast Region of São Paulo State, which has a natural vocation to fish. It is because of its large portion of seashore and large number of fishing communities besides the industries of fish caught. It is a project that also has the goal to change the old orthodox pedagogy for engineering education.

1. Introduction

The mission of Education is most of all, to promote the natural ability of the mind to set and to solve problems and by inter-relation to stimulate the full usage of general intelligence. This general intelligence is the human capability to deal with problems viewing the global aspects that surround it. So it is the global and the complexity that are now more than ever evident in our lives. The educational institutions are redefining its rule in present society and so it became necessary the adoption of new approaches [1]. New programs have been conceived, new laboratories and so on [2].

To form professionals committed with the creation and development of science, principally in engineering field is urgent because Brazil despite the low investment in education system it is a Country, which in biological and engineering areas are not behind other developed Countries. With the goal to defeat the challenge of forming the best professional for this new age the Engineering Coordinating Team of Council of Researches in Education and Sciences in Brazil

has conceived a different kind of approach to a Fishing Engineering Program. It includes in the program what is called "Tapé-Apó", which are extra classes of peculiar areas of human knowledge, specially selected to make the students to develop their abilities of applying their skills in the global context with success.

2. COPEC – an organization generating development

COPEC means Council of Research in Education and Sciences. It is an organization that works visioning the future

It works 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 seeks for

- The improvement of communication and the interchange of researches in education field and sciences between the countries.
- 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.

The council plans to accomplish its goals through:

- Currents Conferences;
- Planning segmented and united actions among schools for the development of projects of internal and external community interests;
- Interchange programs; Projects e researches of supporting;
- To work for the creation of conditions and the means for updating, development and the permanent re-qualification of professionals of the several areas of human knowledge;
- And other means appointed by the Council or by an authorized organ.

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.

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.

3. The Region Vocation

Science has developed itself in a kind of knowledge fragmentation, generating the super specialties, divorced from the global context that they are part, atrophying the ability of integrating and evaluating the issue in its context. The New World order demands a new kind of professional, capable to think global without losing the dimension of local and vice-versa. The fishing engineers that this project intends to form are engineers with solid theoretical knowledge of management, economy and law and also possess great engineering bases.

The new paradigm of education preaches that the capital is the intellect and people are the most important, but by the other hand it is still difficult the total absorption of this new model of development [3]. Changes have been happening and many of them are successful. COPEC proposal program for engineering education is one of the successful new kind of forming good engineers prepared to face next century.

Very close to the environmental and biomedical areas fishing engineering is a young field but that has been contributing to the development of exploration techniques, conservation and correct use of natural aquatic resources. Fishing engineering is rooted in:

- Biological Sciences: -Ecology, Biology and Genetics;
- Earth Sciences: -Physics and Chemistry;
- And Mathematics.

These courses give the necessary basis to understand the aquatic atmosphere and its resources.

The practical classes and the laboratories take half of the schedule and they approach techniques and location technologies, creation and reproduction of aquatic species and of industrialization.

It is a program that will fulfill the lack of this kind of engineer in the Atlantic Coast Region of São Paulo State, which has a natural vocation to fish due to its large portion of seashore and large number of fishing communities besides the industries of fish caught [4].

4. Fishing Engineering Project

The Fishing Engineering project proposed by COPEC has a program, which basic characteristics are:

- Under graduation;
- Five years;
- Fulltime students;
- Morning and/or afternoon classes;
- Program in blocks;
- The inclusion of new courses;
- The effective work in projects.

The program includes:

- The basic science courses;
- Basic engineering sciences courses;
- Industrial engineering courses;
- Specific fishing engineering courses.

Other one was added and it is Aquiculture that is essentially for the development of methods, devices and equipments for creation and multiplication of species in captivity. This choice aims to provide the students another view more in accordance with the new demands of environment. It will also give the students an opportunity to develop skills in management and entrepreneurial ship.

The specific courses of fishing engineering are distributed along the last three years of the program. These courses allied with the basic science courses and the basic engineering courses can provide to the students a new kind of formation, which is much more dynamic and general [5].

The curriculum that was proposed attends a minimum of the resolution 48/76 of April 27 of 1976 from CFE – Federal Council of Education about the curricula directress [6]. The courses follow basically the ones of traditional program plus the ones that compound the “Tapé-Apó” proposal [7].

May be the most important part of this program is the so-called “Experience Term”, which is a period of four months at the end or in the beginning of the last two years. It is a period when the students work effectively in a fishing community, fish caught industry or research center. A professor altogether the supervisor of the institution supervises the students’ work in part of a project. They have to accomplish their work so that another student that will replace him in the project performs the next step considerably. The effective work in projects exposes the students to the real environment and problems, and this provides the interface of the theory and the practice. It is believed that the seeking for the right solution for such problems enlarges their academic horizons [8].

It is program that has been developed and is working in a private University of the region that has certain peculiarities. It is brand new and although it has a large Campus most of the of Laboratories are being built. So it is an under construction university.

This is the fourth year and by now, it is possible to have an evaluation of the program and its viability. Under the perspective of financial matters, it is not what is considered the most feasible once it requires many investments in laboratories and technical staff really qualified. Besides the classes are small and the number of students interested in this Program is decreasing year by year. Small classes, many teachers and technicians and Laboratory constructions are not helping the continuing of the Program.

In terms of quality, it has been one of the best Programs of the College in which the students also have demonstrated a high level of performance. The students’ performance is one aspect that confuses the conclusion about the Program. Is it good because it has a good content? Or is it good because it has good dedicated students? It is necessary some more time and evaluation to get it.

5. Conclusions

There are some aspects of the program that have to be taken into account and which makes it possible as an effective engineering program conceived and applied with specific goals. It is an Engineering College in a University that is private, inserted in a region that is privileged. It is Southeast part of the Country, a small town in one of the most cosmopolitan state, strategically close to the sea, close to the largest industrial park and with one of the highest level of salaries and wealthy people. These aspects altogether and the willing to do something to foster the engineering formation make it feasible and successful.

The formation of fishing engineering of present world requires the development of skills like to make research in the fields of Ecology, Biology and Genetics. S/he has to be a professional with scientific mind, capable of finding solutions in according to the local necessities having in mind the context of a global world. It is the development of the ability of creating technology to be used to the welfare of contemporary society, viewing the future.

The “Experience Term” has become a very important part of students’ formation once it provides them a good quality of practical experience working. It is a period when they can get practice before to enter in work market. It is the only Fishing Engineering Program that has this genuine practice period. In some cases, it results in chances for the students that receive proposals for work in the enterprise or Labs.

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