

New Strategies for a New Concept of Education: Cultural Immersion Fostering the Engineering Formation

Claudio da Rocha Brito, Ph.D./ Melany M. Ciampi, Ph.D./ Dan Budny, Ph.D.

President of Council of Researches in Education and Sciences/ President of Brazilian Nucleus of Environmental Researches and Health / Academic Director of the Freshman Programs of University of Pittsburgh

cdrbrito@copec.org.br / melany@copec.org.br / budny@pitt.edu

Abstract

Sustainable development with social promotion of individuals and society has been the constant search of scientists, educators and some politicians not only of this Nation but also worldwide. Despite the efforts of so many educators the present status of Education is not yet as good as it should be. COPEC – Council of researches in education and sciences has started a new program in according to the new strategies adopted by the organization in order to accomplish its main goal of providing high level of education and research. COPEC is offering a new Activity called “Cultural Immersion in Brazil” that is a 15 days in Atlantic Forest Region at the São Paulo State, South of Brazil. It is dimensioned for students in Engineering, Technology and Business Administration Fields. The Program includes visit to Enterprises and Universities and social activities, which will provide the students a great experience and discovering a different world. During the visits the students have to analyze the Ethical Issues in his/her Profession, Educational Breadth as Professional Development, Lifelong Learning, and Continuing Education as Professional Development, The Social Environment of Professional Life, and Functioning on Multi-Disciplinary Teams. It is important to point out that the balance of activities is fundamental for the acquisition of the knowledge not only about the work environment but also about the society that it serves. It has been developed by the organizing team of COPEC altogether with the enterprises of the region that were willing to collaborate with the project It can happen in other regions of the Country in according to the needs or the desire of the group. Previous experiences have showed positive aspects of such program like the opportunity for students and teachers to intensify the exchange of ideas and the mobility despite the fact that all the involved people have a chance to develop projects in joint ventures. Students pointed out the fact that for them it is a life time experience to know more about a different culture and the possibility to explore the working world in a nice and safe environment.

Introduction

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Despite the efforts of so many educators the present status of Education is not yet as good as it should be.

COPEC – Council of Researches in Education and Sciences is a council, which works have among others the objective 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. 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.

COPEC is offering a new activity called “*Cultural Immersion in Brazil*” that is a 15 days in Atlantic Forest Region at the São Paulo State, South of Brazil [1]. It is dimensioned for students in Engineering, Technology and Business Administration Fields. It is a very rich and well organized project that has showed to be a very good program that brings a new perspective to the future professional as the statement of many students who have been in this program.

The Council - History and Development

The Council of Researches in Education and Sciences 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 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 is a council that seeks the improvement of communication and the interchange of researches in education field and sciences between the countries.

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. It is a group of scientists, professors and professionals whose vision of future has driven them to start this work.

New Strategies for Future

COPEC has been looking for new strategies of action for the next five years [2]. The goal of its efforts is to provide new programs and projects in Engineering and Technology for applications that encounter the real necessities of society. To reach this target it was necessary to get an

integrated vision of the several variables of Country's historical process like social, political, cultural, and scientific and others. It was also necessary to abandon some stereotyped ideas and conceptions of policy and science and look to the future with not only optimism and hope but also having in mind that to achieve success it is fundamental to take into account the social conditions of the people [3].

The search for new strategies by COPEC in the community has led to the sense of some aspects that can ensure the success of its activities like:

- The Natural Vocation of a Region;
- The Necessities of a Community;
- The Global Aspects of Present Development Model;
- New Technologies and Social Enhancement.

These aspects have to be taken into account in order to act properly and develop programs and activities that will really enhance the science and technology for national needs [4]. Following these parameters for the accomplishment of its objectives COPEC has started a new program that has been named "*Cultural Immersion in Brazil*". It is essentially a group of students spending 15 days in Atlantic Forest Region at the São Paulo State, South of Brazil busy with activities that are part of an intense course. It has been created for students in Engineering, Technology and Business Administration Fields.

The Program includes visit to Enterprises and Universities and social activities, which will provide the students a great experience and discovering a different world. It has been dimensioned taking into account the time available for technical activities and the time for exploring the culture of the town. It is important to point out that the balance of activities is fundamental for the acquisition of the knowledge not only about the work environment but also about the society that it serves. It has been developed by the organizing team of COPEC altogether with the enterprises of the region that were willing to collaborate with the project [5].

The organization of the program can be done in other regions of the Country in according to the needs or the desire of the group. The chosen region was made principally because it is a region with all the infra structure of large cities but at the same time it has small towns, easy to walk around, close to the nature, safe and also a region that contains a large number of education institutions, around 12 among private and public universities and Colleges [6-7].

The Program

The Program is very simple and it has two parts the Technical Activities and the Social Activities both very important to have a real although brief, experience and to understand a little about the kaleidoscope of culture of a Country like Brazil, which historical process has generated a national identity of quite 170 million inhabitants.

All the activities are accomplished in 15 days of intensive work in Universities and enterprises within the Technical Activities. The groups have been in number of 25 to 30 students and two teachers from the visiting student university. The local hosts are three and the enterprises and

university mobilizes some people to welcome them and deliver some lectures besides to accompany them during the visit with very detailed descriptions of activities and equipments.

During the Social activities the students have the opportunity to visit some very interesting places meeting with natives in a friendly environment. The schedule is formatted in a way to provide them also some free time to rest and enjoy the city and all that it can offer.

a) Technical Activities

It may be the main part of the activities once it is not possible to dissociate it from the social activities because both are very important to the comprehension of the cultural immersion concept.

This part of the program contains:

- Visit to the Universities

At least Two Universities will be visited, where the students spend some time having classes and developing a small lab project with Brazilian Students.



FIGURE 1. Picture of students from Pittsburg University of Pennsylvania USA, in front of the Santos City Hall for a picture for the Journal of the City.

- Visit to the main National Enterprises of the region

Like the Sea Port (the largest of South America), Petrobras, the Brazilian Petroleum Company (the only national one of Latin America), SABESP – The State Company for Water Treatment and the Power Plant of Itatinga. These are some of the enterprises that can be visited among others that can have available time and personnel to receive the students.

- Visit to the City Hall

A meeting with the Mayor can happen, besides a walk along the Old Town and the Tourism Center where a meeting with the Tourism Secretary can happen.

- A trip to Rio de Janeiro

Where the students not only visit the main tourist places like the Sugar Loaf, the Christ and Copacabana Beach but also visit a traditional Company the H. Stern Jewelry. This way it is a pleasant technical visit.

- Lectures of prominent professionals of the Country

Some prominent professionals of different fields are invited to deliver a lecture to the students in a friendly and interactive environment.

The choice of all traditional Brazilian Companies is due to the fact that so the foreign students can know how Companies from other Country work: the similarities and the differences.

The Program is not final; some changes can be made in order to fit the necessities of the group as much as possible.

b) Social Activities

This part of the program has been dimensioned in order to provide the students the opportunity to see a little of the social environment. It is important to see and to evaluate the different forms of cultural manifestation that are part of the construction of that society. They acquire knowledge about history and ethnic getting in touch with some groups that altogether with the many people from many parts of the world that came to the Country and built the nation.

It contains:

- Visit to a Brazilian Indian Village

At the south or north part of the seashore close to Santos, in other small towns there are incredible Indian villages. The students can experience a little bit of life in wild nature, in a safe environment, close to the city. There they can identify the lifestyle of these people that has changed very little despite the contact with white men civilization.

- Visit to the Atlantic Forest Region

It is a very good opportunity to the students to explore and to know a little bit about the last piece of Atlantic Forest of the Country. Trails in the forest with historical points and a lot of Botanical and Zoological information provided by very experienced environmentalists that take care of these regions. Rivers with translucent waters, sea and old civilization.

- One day in paradise!

A Day to relax before hard work on a private island with barbecue and a lot of fun! A whole day to enjoy the outstanding nature and the company of others, a chance to know each other better!

Besides the students will have free time to enjoy the beaches and night life in Santos as well as to keep in touch with other students of the universities.

Main Aspects of the Program in Perspective

All the students have the task of writing a journal analyzing some aspects taking in to account the similarities and the differences of USA and the visited Country. These aspects are essentially:

Global/National Environment, which questions are: What interesting political, economic, social or technological factors affect the firm that you visited today? Why are these factors of interest to a professional in business or engineering?

Industry Analysis: Describe the industry of the firm that you visited today. What are the major product categories in this industry and who are the firm's major competitors? What unique challenges or opportunities exist for firms in this industry? Why is this industry of interest to a professional in business or engineering?

Firm Analysis: What interesting strengths or weaknesses were discussed (or are apparent) in the firm that you visited today? Does this firm face any interesting opportunities or threats from the external environment? Why is this firm of interest to a professional in business or engineering?

Professional development is also the target of this analysis and the students are requested to think about and to answer some questions as such:

Ethical Issues in My Profession: Give an understanding of professional and ethical responsibility of the global industry. How does this affect life and business in the United States?

Educational Breadth as Professional Development: Describe the need for a broad education necessary to understand the impact of engineering/business solutions in a global and societal context. Explain what future courses you should take to prepare you for a global economy.

Lifelong Learning, Continuing Education as Professional Development: Give recognition of the need for, and an ability to engage in life-long learning and explain how this is needed to compete in the future.

The Social Environment of Professional Life: Explain why it is important to have knowledge of contemporary issues related to the global economy. What political, social, economic and diversity issues are involved within engineering/business that are involved within your industry? How does this affect life and business in the United States?

Functioning on Multi-Disciplinary Teams: It is important for professionals to be able to function and communicate effectively as a member of a team of individuals from diverse backgrounds.

How do you work when you are a member of such a team (for example – you are either an engineering student who is traveling with business students, or vice-versa)? What are some the challenges involved in establishing and maintaining effective communication on this type of cross-functional team?

Final Comments

For the accomplishment of such project the “*Cultural Immersion in Brazil*” it is necessary to have an infra-structure of networking and local organizers not to mention to provide good transportation, lodge, meals and hosts. The costs are not so high and the results have been very good in according to the evaluations made with the students and the teachers [8].

The program comes to add to the fostering of higher quality education to the students of engineering, technology and business administration programs. It has been a very rewarding project once both sides gain with the exchange of ideas and experiences that enrich the formation of future professionals.

Both technical and social activities of the program were conceived in a way that the students are busy at least 60% of the day visiting different enterprises analyzing their activities, having lectures or watching classes and developing small projects in the university. It is balanced in order to provide them also free good quality free time just enjoying the town or the beach interacting with other native students.

The city has a preponderant role in the development of this program and the politicians and scientific community have collaborated to the success of the program. The students have been welcomed by the Mayors of some cities of the region and the enterprises and universities have received them willing to show their best.

The evaluations forms showed to be a powerful instrument of feedback for the betterment of the project once it tries to evaluate all the aspects of the program. It is also clear that a valuable acquisition is the human aspect of the program that mobilizes people willing to cooperate and the friendship that emerges among the students and teachers.

A further step is the development of an internship when around 3 students will remain living in town and will conceive and develop a project in a joint venture with a local researcher of any education institution, private or public. It can be in any field of engineering, technology and business administration. The duration of the project is around three months.

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Biographical Information

CLAUDIO DA ROCHA BRITO is Professor of Electrical and Computer Engineering; President of Council of Researches in Education and Sciences (COPEC), President of Fishing Museum Friends Society (AAMP), President of (Brazilian) National Monitoring Committee of "Internationale Gesellschaft für Ingenieurpädagogik" (IGIP) and Vice-President of Brazilian Nucleus of Environmental Researches and Health (NBPAS). He is Chairman of Working Group "Ingenieurpädagogik im Internationalen Kontext" and Member of International Monitoring Committee in IGIP, Council Member of "International Council for Engineering and Technology Education" (INTERTECH), Board Member of "Global Council on Manufacturing and Management" (GCMM) and Director of Brazilian Network of Engineering (RBE/SP). He was President of Brazilian Chapter of Education Society of the Institute of Electrical and Electronics Engineers, Inc (IEEE-EdSoc), Member of Administrative Committee of Education Society of the Institute of Electrical and Electronics Engineers, Inc (IEEE-EdSoc) in USA, Secretary of Santos region of SBPC - Brazilian Association for the Advancement of Science, Adviser for

International Subjects of the Presidency of Brazilian Society for Engineering Education (ABENGE), Dean of International Relations of SENAC School of Engineering and Technology, Member of Executive Committee of Asociación Iberoamericana de Instituciones de Enseñanza de la Ingeniería – ASIBEI (Iberian-American Association of Engineering Education Institutions), Councilor of Urban Development City Council (CMDU) and Councilor of Economics Development City Council (CDES). He is Member of IGIP (International Society for Engineering Education), SEFI (European Society for Engineering Education), ASEE (American Society for Engineering Education) and INTERTECH (International Council for Engineering and Technology Education). Dr. Claudio da Rocha Brito has received a B.S. degree in Electrical Engineering, B.S. degree in Mathematics, B.S. degree in Physics, M.S. and Ph.D. in Electrical Engineering all from the University of São Paulo. He is listed in "Who's Who in the World", "Who's Who in America", "Who's Who in Science and Engineering", "Five Thousand Personalities of the World", "Dictionary of International Biography", "Men of Achievement" and others similar publications. Although he was born in São Paulo City, he has received the title of Santos Citizen from Santos City Hall and he was the first professor non-European who has received the title "International Engineering Educator" of IGIP. Dr. Claudio da Rocha Brito has coordinated and has participated of dozens of organizing committees of events in Brazil and abroad like: General Secretary of ICECE'99 (International Conference on Engineering and Computer Education), the Technical Program Chair of ICECE'2000, the General Chair of INTERTECH'2002 (International Conference on Engineering and Technology Education), of ICECE'2003, of WCETE'2004 (World Congress on Engineering and Technology Education), of GCETE'2005 (Global Congress on Engineering and Technology Education), of WCCSETE'2006 (World Congress on Computer Science, Engineering and Technology Education); of GCMM'2006 (Global Congress on Manufacturing and Management), of ICECE'2007, of CBPA'2001 and CBPA'2002 (Brazilian Congress of Environmental Researches) and CBPAS'2003, CBPAS'2004 and CBPAS'2005 (Brazilian Congress of Environmental Researches and Health), EHWC'2006 (Environmental and Health World Congress), SHEWC'2007 (Safety, Health and Environmental World Congress) and WCCA'2007 (World Congress on Communication and Arts).

MELANY M. CIAMPI is President of Brazilian Nucleus of Environmental Researches and Health (NBPAS), Vice-President of Council of Researches in Education and Sciences (COPEC), Vice-President of Fishing Museum Friends Society (AAMP) and Vice-President of (Brazilian) National Monitoring Committee of "Internationale Gesellschaft für Ingenieurpädagogik" (IGIP). She is Vice Chair of Working Group "Ingenieurpädagogik im Internationalen Kontext" in "Internationale Gesellschaft für Ingenieurpädagogik" (IGIP), Member of Administrative Committee of Education Society of the Institute of Electrical and Electronics Engineers, Inc (IEEE-EdSoc) in USA and Council Member of "International Council for Engineering and Technology Education" (INTERTECH). She was Vice-President of Brazilian Chapter of Education Society of the Institute of Electrical and Electronics Engineers, Inc (IEEE-EdSoc), State Councilor of SBPC - Brazilian Association for the Advancement of Science and Manager of International Relations of SENAC School of Engineering and Technology. She is Member of IGIP (International Society for Engineering Education), SEFI (European Society for Engineering

Education), ASEE (American Society for Engineering Education) and INTERTECH (International Council for Engineering and Technology Education). She was the first woman non-European who has received the title “International Engineering Educator” of IGIP. She has coordinated and has participated of dozens of organizing committees of events in Brazil and abroad like: the Exhibits Chair of ICECE’99 (International Conference on Engineering and Computer Education), the Publications Chair of ICECE’2000, the General Secretary of CBPA’2001 and CBPA’2002 (Brazilian Congress of Environmental Researches), the Technical Program Chair of INTERTECH’2002 (International Conference on Engineering and Technology Education), of ICECE’2003, of WCETE’2004 (World Congress on Engineering and Technology Education), of GCETE’2005 (Global Congress on Engineering and Technology Education), of WCCSETE’2006 (World Congress on Computer Science, Engineering and Technology Education); do GCMM’2006 (Global Congress on Manufacturing and Management); of ICECE’2007, of CBPAS’2003, CBPAS’2004 and CBPAS’2005 (Brazilian Congress of Environmental Researches and Health), EHWC’2006 (Environmental and Health World Congress), SHEWC’2007 (Safety, Health and Environmental World Congress), WCCA’2007 (World Congress on Communication and Arts) and the International Chair of FIE’2003 (Frontiers in Education Annual Conference), FIE’2004, FIE’2005, FIE’2006 and FIE’2007.

DAN BUDNY has joined the University of Pittsburgh faculty as Academic Director of the Freshman Programs and a Professor in Civil Engineering. He had been Professor at Purdue University. He holds the B.S. and M.S. degree from Michigan Technological University, and a M.S. and Ph.D. degrees from Michigan State University. His research has focused on the development of programs that assist entering freshman engineering students, including academically disadvantaged students; succeed during their first year. Of particular note are the highly successful counseling and cooperative learning programs for first-year students that he created within the Freshman Engineering Department at Purdue. Dr. Budny has numerous publications and presentations on engineering education. At Purdue, he was widely recognized for outstanding teaching, receiving the Innovation in Helping Students Learn Award, the Purdue Student Government Chapter Advisor Award, the University Outstanding Undergraduate Teaching Award, the Engineering Outstanding Undergraduate Teaching Award (twice), the Civil Engineering best teacher award, the Freshman Engineering Department’s best Counselor Award (three times), and the Freshman Engineering Department’s best Teacher Award (four times). He was selected as a Founding Fellow of the Purdue University Teaching Academy. Dr. Budny has also been awarded the 1996 ASEE Dow Young Educator Award, the 1994 ASEE Sectional Teaching Award, the 1998 Illinois Indiana Outstanding Service Award, 1998 ASEE Ronald Schmitz Outstanding Service Award and the 1992 FIE Ben Dasher Award. Dr. Budny is very active in ASEE within the Freshman Programs and the Educational Research and Methods Divisions, and is on the ASEE board of directors. He served as the 1999 Frontiers in Education Conference General Chair and Proceedings editor for the 1995 and 1997-99 FIE Conferences; in this capacity he introduced CD and web-based conference proceedings.